Key Environmental Indicators

Tracking progress towards environmental sustainability

The United Nations Conference on Sustainable Development (Rio+20) in June 2012 was the largest UN conference ever held and a further step towards achieving a sustainable future. The fifth edition of the UNEP *Global Environment Outlook* report (GEO-5) – launched on the eve of Rio+20 – demonstrates that the world continues to speed along an unsustainable path, despite hundreds of internationally agreed goals and objectives for sustainable development. GEO-5 also shows that clear targets and indictors are needed if progress towards sustainable development is to be measured and improved.

The Rio+20 outcome document, *The Future We Want*, calls for a wide range of actions, including launching a process to establish sustainable development goals (SDGs). The SDGs should address – and incorporate in a balanced way – the three dimensions of sustainable development (social, economic and environmental) and their interlinkages. They should build on the ongoing Millennium Development Goals (MDGs) process and be accompanied by targets and indicators for tracking progress towards their achievement (UN 2012a).

Clear goals, concrete numerical targets, and solid data for use in tracking progress are critical to the success of international agreements (UNEP 2012a). So far, the field of environment has remained markedly weak in terms of specific goals, quantified targets, and detailed data with which to monitor and assess changes. For a considerable number of environmental issues, however, it is possible to use one or more indicators to show at least the direction in which changes are taking place at global, regional or local levels. Together, these key indicators provide a general, snapshot picture of the global environment and of progress towards environmental sustainability – or of further environmental deterioration.

The Mau Forest, Kenya. Aerial surveys and other observation techniques provide important information on state and trends in the environment.
Credit: Christian Lambrechts

Indicators are measures that can be used to illustrate and communicate complex phenomena in a simple way, including trends and progress over time.

The set of key environmental indicators presented in this chapter can serve as a basis for elaborating sustainable development goals and targets and further indicators for tracking progress toward environmental sustainability. However, for several environmental issues even the most basic data are not available in most parts of the world to depict consistent, long-term trends, such as for the use of chemicals, waste collection and treatment, air quality, land degradation, and biodiversity loss. A roadmap showing the way towards sustainable development needs to include more attention to environmental data collection and processing on the part of the international community.

The set of key indicators in the following sections corresponds to major global environmental issues: climate change, ozone depletion, chemicals and waste, natural resource use (air, land, water, biodiversity) and environmental governance. Indicators which coincide with those used in the MDG process are marked.

Climate change and energy

Global CO_2 emissions from fossil fuel combustion have continued to increase in recent years, despite countries' existing commitments and economic crises in various parts of the world. They reached 32.1 billion tonnes in 2009 **(Figure 1)**. This increase is occurring to a large extent in the Asia and the Pacific region, where per capita emissions are approaching the world average although they are still below those in Europe, West Asia, and particularly North America **(Figure 2)**. Growth in emissions

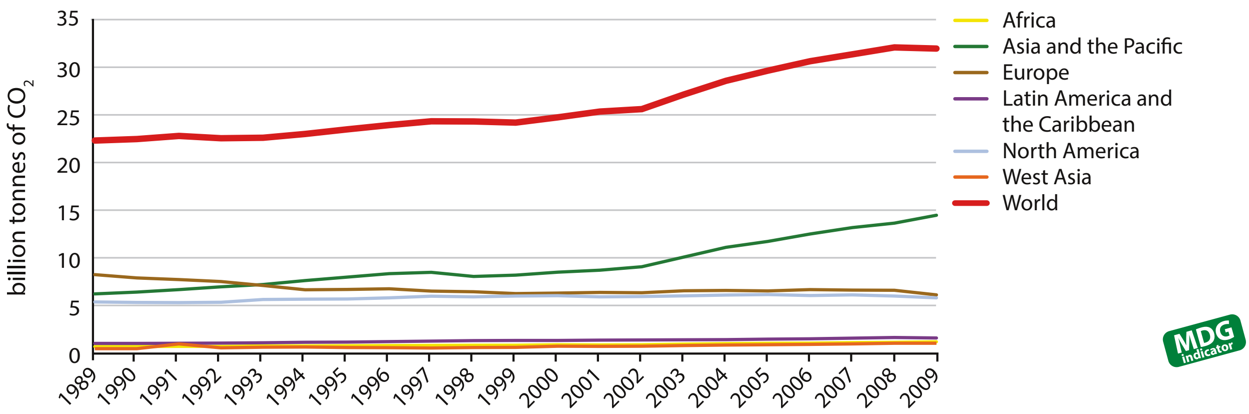


Figure 1: Carbon dioxide emissions from fossil fuels and cement production, expressed in billions of tonnes of CO_2, 1989-2009. Global CO_2 emissions have increased in recent years, mainly in the Asia and the Pacific region. *Source: UNEP EDE, compiled from Boden et al. (2012)*

causes higher CO_2 concentrations in the atmosphere and rising global temperatures. 2012 was one of the ten warmest years on record, as well as the 36th year in a row in which temperatures exceeded the long-term average (NOAA 2013).

The continued increase in CO_2 emissions indicates widening divergence from a trajectory that would make it possible to limit global warming to the 2°C needed to stay within safe planetary limits. Keeping global temperature rise below 2ºC has become the basic goal of international climate change negotiations. This was acknowledged in recent sessions of the Conference of the Parties to the UNFCCC. In view of the gap between targeted emission reductions and actual trends, in November 2012 the 18th session of the Conference of the Parties to the UNFCCC in Doha, Qatar, agreed to scale up efforts before 2020 (beyond countries' existing pledges to curb emissions) in order to stay below 2°C warming.

Greenhouse gas emissions are largely produced by the combustion of fossil fuels for industrial production, heating and transport, in addition to deforestation and other land use changes. Fossil fuels continue to dominate global energy supply **(Figure 3)**. Significant investments in more sustainable forms of energy, notably solar and wind, have resulted in impressive growth of renewable energy use **(Figure 4)**, but the overall share of renewables is still modest compared to that of fossil fuels at 12.9 per cent of overall energy supply (in 2010).

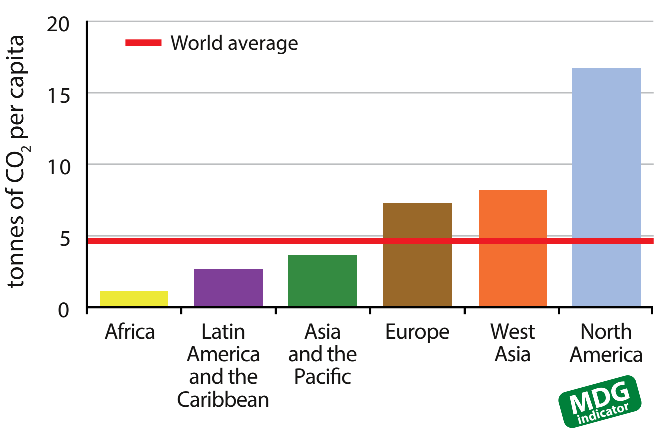


Figure 2: Carbon dioxide emissions per capita, 2009. Per capita emissions of CO_2 are well above the global average in Europe, West Asia and particularly North America. *Source: UNEP EDE, compiled from Boden et al. (2012)*

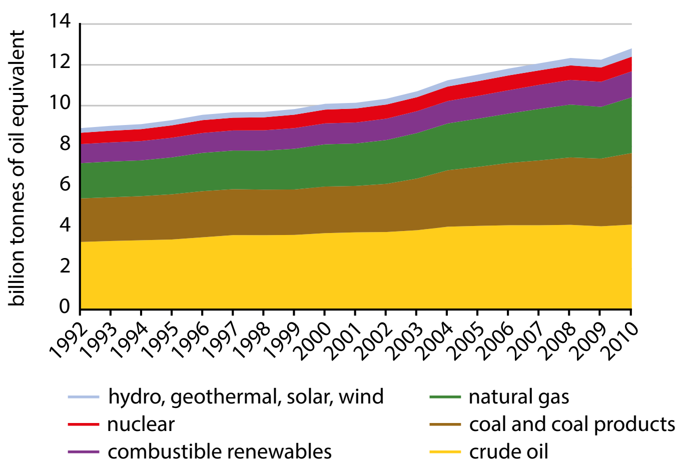


Figure 3: Primary energy supply, 1992-2010. Use of fossil fuels has increased steadily in the past two decades. A small dip occurred around 2009. Renewable resources represent a modest but rising share. *Source: UNEP EDE, compiled from IEA (2012a)*

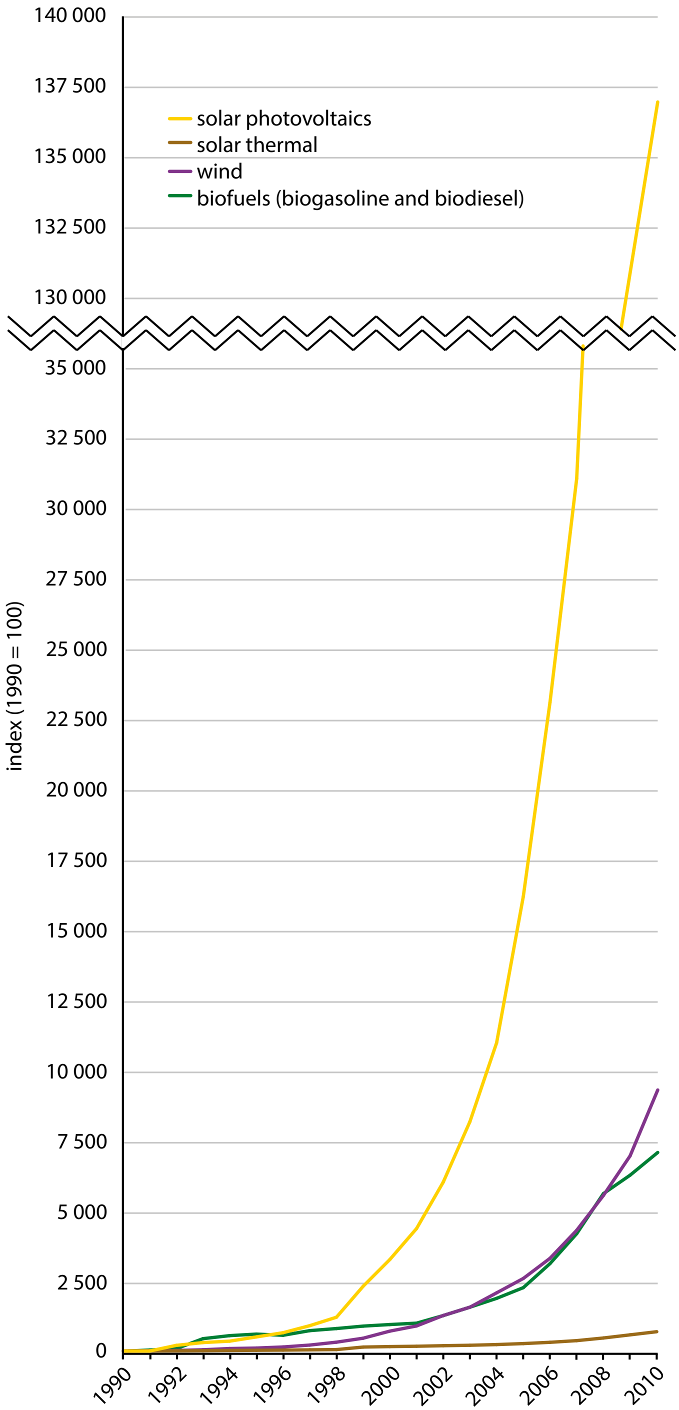


Figure 4: Renewable energy supply index, 1990-2010 (1990=100). Use of solar energy is skyrocketing, followed by wind and biofuels. *Source: UNEP EDE, compiled from IEA (2012b)*

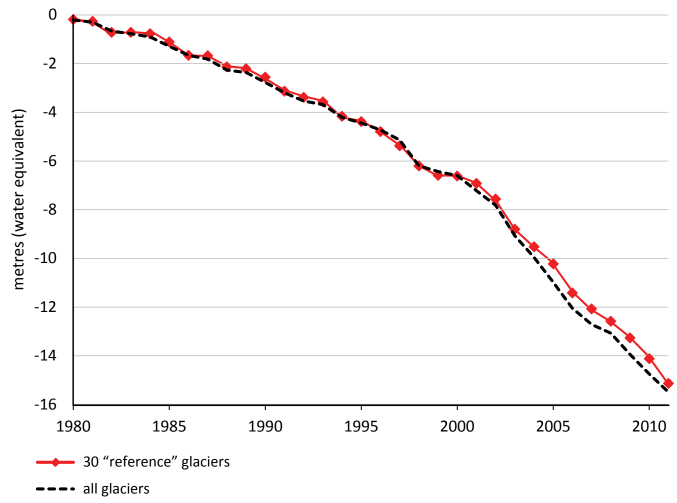


Figure 5: Mountain glacier mass balance, 1980-2011. Glaciers have continued to melt at unprecedented rates, with increasingly severe impacts on the environment, natural resources and human well-being. *Source: WGMS 2013*

Consistent trends in changes in glaciers are a key indicator of ongoing climate change. Glacier measurements dating to the late 19th century point to dramatic ice loss, even when temporal and regional variability is taken into account. Melting has accelerated in recent years **(Figure 5)**, with significant impacts on the environment and human activities, including by contributing to landslides, changes in water and energy supply, and global sea level rise. Major glaciers shrank 1.05 metre on average in 2011, the latest year for which there are recorded data (WGMS 2013). Arctic summer sea ice is melting rapidly, while land ice is retreating and permafrost is thawing. Figure 1 in Chapter 2 shows the significant reduction of Arctic sea ice cover.

Depletion of the ozone layer

In the last 20 years, through implementation of the Montreal Protocol, consumption of ozone-depleting substances has been reduced by over 98 per cent – a major success story **(Figure 6).** Since most of these substances are potent greenhouse gases, a significant contribution has also been made to protecting the global climate system (UN 2012b). Reductions achieved to date leave hydrochlorofluorocarbons (HCFCs) as the largest group of substances remaining to be phased out under the Protocol.

Governments are considering an amendment to the Protocol to address hydrofluorcarbons (HFCs), a class of chemicals with global warming potential often used as substitutes for certain ozone-depleting substances **(Figure 7)**. The phase-out period for the other main categories of ozone-depleting substances is

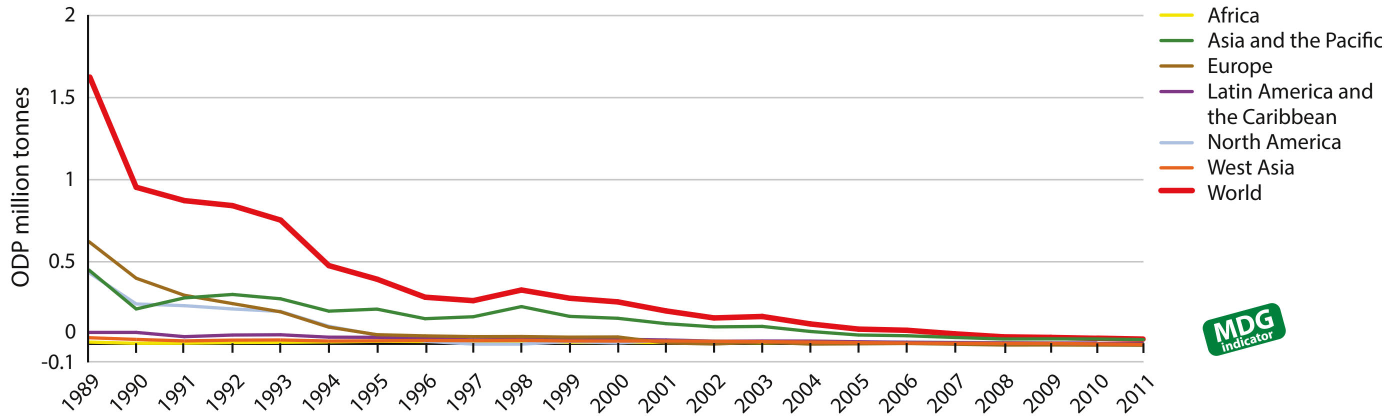
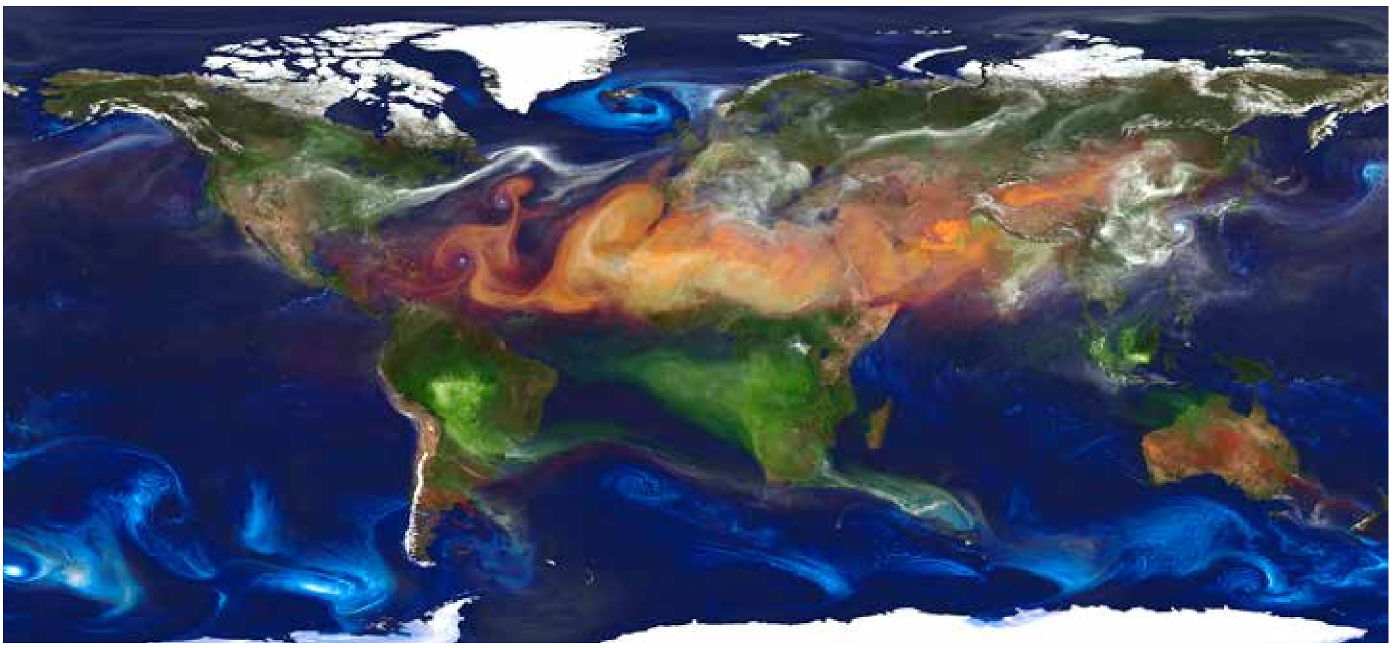


Figure 6: Consumption of ozone-depleting substances expressed as million tonnes of ozone depletion potential (ODP), 1989-2011. Challenges remain, but the consumption of ozone-depleting substances has declined tremendously through implementation of the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer. *Source: UNEP EDE, compiled from UNEP (2012c)*

coming to an end. Closer attention is currently being paid to several small classes of exempted uses of these substances (through better tracking or reporting), as well as to environmentally safe management and the destruction of existing ozone-depleting substances, such as those in obsolete stockpiles and in equipment like air conditioning and refrigerators (UN 2012b).

Chemicals and waste

In response to rising demand for chemicals in products and processes, the international chemical industry has grown dramatically since the 1970s. Global chemical output increased by a factor of 25 between 1970 and 2010, from an estimated US$171 billion to US$4120 billion (UNEP 2012b). Countries, manufacturers and the international community have made



This representation of global aerosols was produced by a simulation of the Goddard Earth Observing System Model, Version 5 (GEOS-5) at a 10-kilometre resolution. Dust (red) is lifted from the surface, sea salt (blue) swirls inside cyclones, smoke (green) rises from fires, and sulphate particles (white) stream from volcanoes and fossil fuel emissions. *Credit: William Putman, NASA/Goddard*

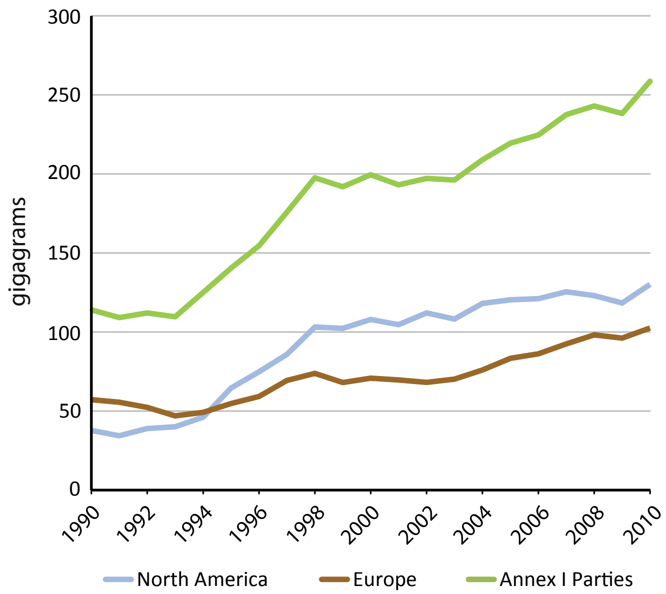


Figure 7: Consumption of hydrofluorocarbons (HFCs) in gigagrams, 1990-2010. Even when considered as suitable replacements from the point of view of protecting the ozone layer, some substitutes for ozone-depleting substances, such as HFCs, have a high warming potential and can have a significant impact on climate change. *Source: UNFCCC (2012)*

some progress in reducing chemical risks over the past four decades using norms, rules and regulations. But greater efforts are needed to achieve the Johannesburg 2020 goal to use and produce chemicals in ways that do not lead to significant adverse impacts on human health and the environment (UN 2002).

An issue of particular concern is the increasing amounts of marine litter and plastic debris that end up in waterways and the ocean, and their potential impact on human health and the environment (UNEP 2011a). The volume of plastics produced in the world has risen sharply in the past decades, reaching 280 million tonnes in 2011 **(Figure 8)**. Approximately 100 kg of plastic materials per person per year is used in North America and Europe (2005). This is expected to increase to 140 kg by 2015. The average is much lower in rapidly developing countries such as those in Asia, but is increasing from 20 kg per person in 2005 to an expected 36 kg by 2015 (UNEP 2011a).

Solutions to health and environmental problems associated with waste are being sought through greater waste reduction and improved waste management (reduction, reuse and recycling). There have been encouraging developments in several parts of the world, including international efforts to control generation and movement of hazardous waste. Lack of comprehensive and comparable data makes it impossible to obtain a clear picture of global resource use and the extent of waste-related problems. One indicator that can be

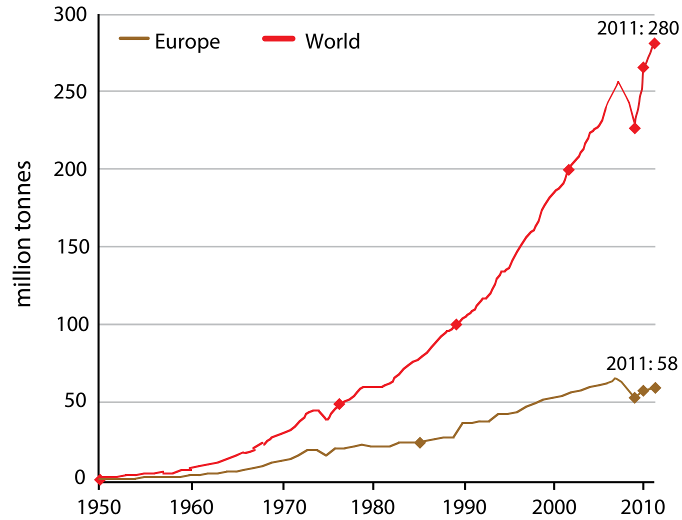


Figure 8: Plastics production in million tonnes, 1950-2011. After a dip around 2008-2009, world production reached a new record of 280 million tonnes in 2011. Plastic debris in the ocean is an issue of growing concern in recent years. *Source: PlasticsEurope (2012)*

used, however, is municipal waste collection. While data are sparse, they are available for recent years in most regions. **Figure 9** shows that Europe stands out in this respect, followed by Asia and the Pacific, North America, Latin America and the Caribbean, and West Asia. For Africa no regional data can be provided.

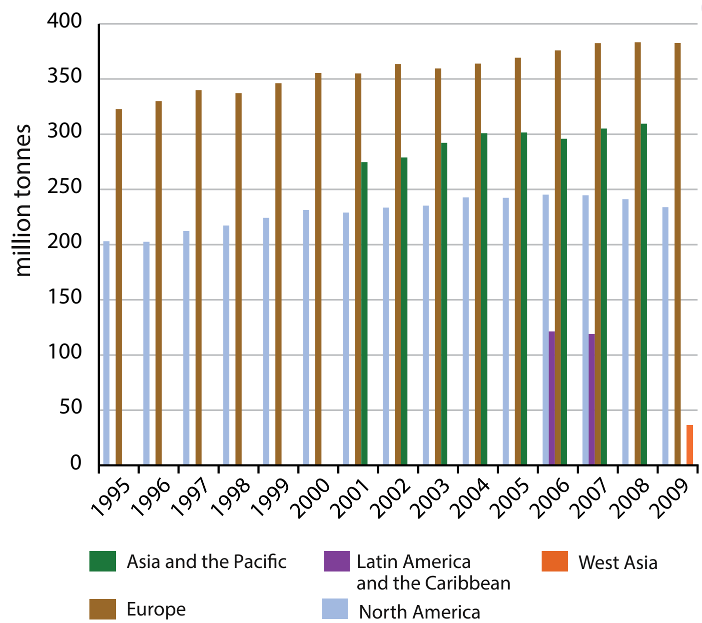


Figure 9: Municipal waste collection in different regions, 1995-2009. Data are sparse, and for Africa no regional data are available. *Source: UNEP EDE, compiled from UNSD (2012).*

Natural resource use

Natural resources are essential to meet basic needs. However, their exploitation has begun to exceed the Earth's capacity. The scale of human activities is "eating into" the planet's reserves. As an analogy, it is said that today we use the equivalent of 1.5 Earths to provide the resources we use and to absorb waste, and by the 2030s we may need the equivalent of two Earths to maintain our current lifestyles (GFN 2012).

Fisheries

An outstanding example of resource depletion is the condition of global fish stocks. Marine fish catch rose steadily to approximately 93 million tonnes per year in the mid-1990s, but has been levelling off since or even decreasing **(Figure 10)**. Only the Asia and the Pacific region continues to show an upward trend. At the same time, the percentage of overexploited fish stocks has risen and the proportion of species not being fully exploited has fallen **(Figure 11).** Overexploitation not only has adverse environmental impacts, but reduces fishery production, with negative social and economic consequences. Despite the worrisome global situation for marine capture fisheries, some regions have made progress in reducing exploitation rates and restoring overexploited fish stocks and marine ecosystems through effective management (FAO 2012c).

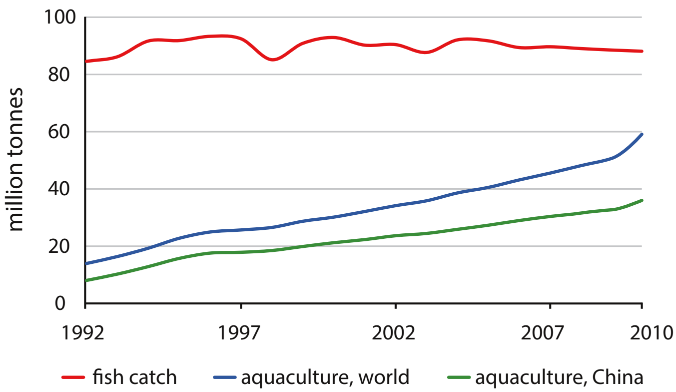


Figure 10: Fish catch and aquaculture production, 1992-2010. The global fish catch has stabilized at around 90 million tonnes per year. Aquaculture has been increasing significantly, particularly in China and other parts of Asia. *Source: UNEP EDE, compiled from FAO (2012b)*

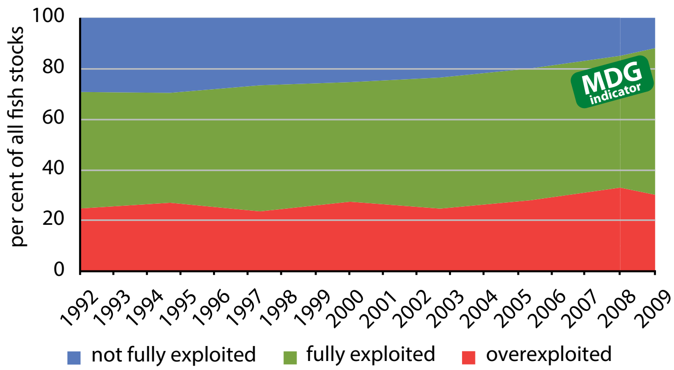


Figure 11: Fish stocks exploitation, 1992-2009. The percentage of fish stocks fully exploited or overexploited was 85 per cent in 2009. *Source: UNEP EDE, compiled from FAO (2012c)*

Ocean

Because of increasing CO_2 levels in the atmosphere, the ocean and coastal areas are becoming more acidic, as shown by gradually decreasing pH values **(Figure 12)**. Absorption of CO_2 in marine waters alters the chemistry of the ocean, with harmful consequences for shell-forming marine life. This, in turn, can disrupt ecosystems and impact fishing, tourism and other human activities that rely on the sea. Ocean acidification is rapidly becoming a critical issue, with the potential to affect many species and their ecosystems and considerably influence the marine-based diets of billions of people (UNEP 2010).

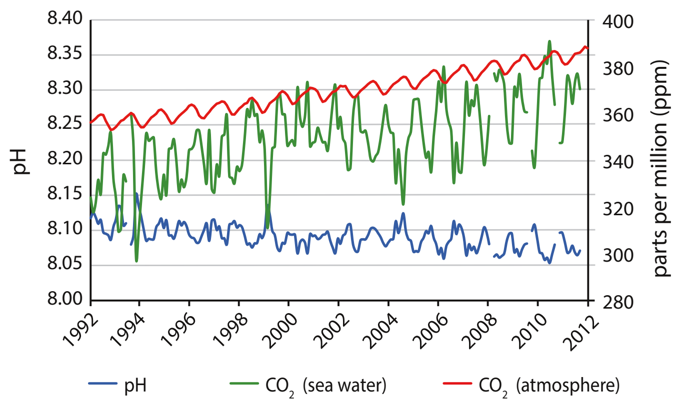


Figure 12: Atmospheric CO_2 concentrations and ocean acidification, indicated by increased partial pressure of CO_2 and lower pH of global mean surface water, 1992-2012. *Source: Caldeira and Wickett (2003), Feely et al. (2009), Tans and Keeling (2011)*

Forests

Trees and other plants have provided fuel and building material for human societies since prehistoric times. As human populations have grown, forests have changed and evolved differently in different regions (FAO 2012b). Following decades of heavy deforestation in many parts of the world, the rate is slowing and forested area in some regions is increasing. Harvesting of roundwood appears to have levelled off in recent years in most regions. In West Asia the forest harvest rate has been increasing, notably in 2010 **(Figure 13)**. Sustainable forest management is the key to reversing depletion and literally "greening the world". Certification of wood and other forest products is one indicator of better forest management. Total

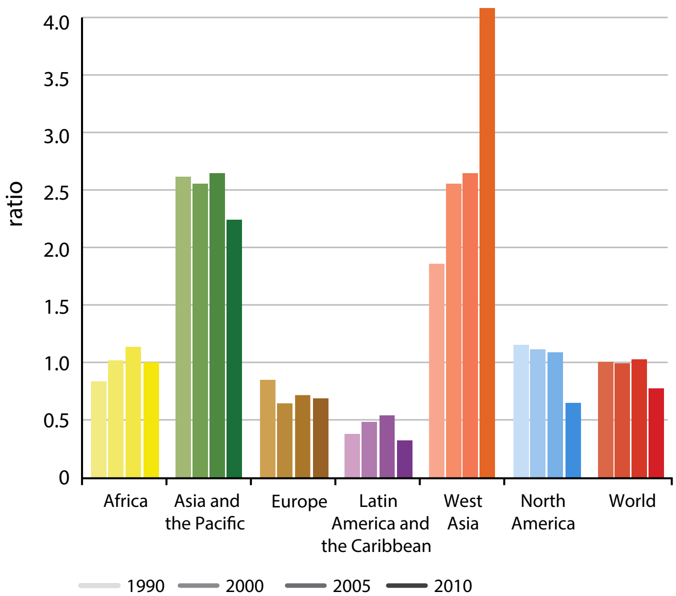


Figure 13: Forest harvest rates expressed as the ratio of roundwood production to growing stock in forests, 1990-2010. After decades of increases, harvesting of roundwood appears to have levelled off in recent years, except in West Asia. *Source: UNEP EDE, compiled from FAO (2005) for 1990, 2000 and 2005, and FAO (2010) for 2010*

certified forest area managed under the two main certification bodies – the Forest Stewardship Council (FSC) and the Programme for Endorsement of Forest Certification (PEFC) – is still modest, but an 8 per cent increase since 2002 is impressive. The highest proportions of certified forest are in Europe and North America **(Figure 14)**.

Water

In 2010, 89 per cent of the world population had access to improved drinking water sources, up from 76 per cent in 1990 **(Figure 15)**. This means the global MDG target of halving the proportion of people without sustainable access to safe drinking water was met five years ahead of the 2015 target, with the caveat that more progress was made in urban areas compared to rural areas. Some 11 per cent of the global population (about 783 million people) still does not have access to improved drinking water sources. Coverage remains very low in Oceania and sub-Saharan Africa, which are not on track to meet the MDG drinking water target by 2015 (UN 2012b). The target of halving the proportion of people without sustainable access to basic sanitation continues to be a challenge, particularly in rural areas in developing regions.

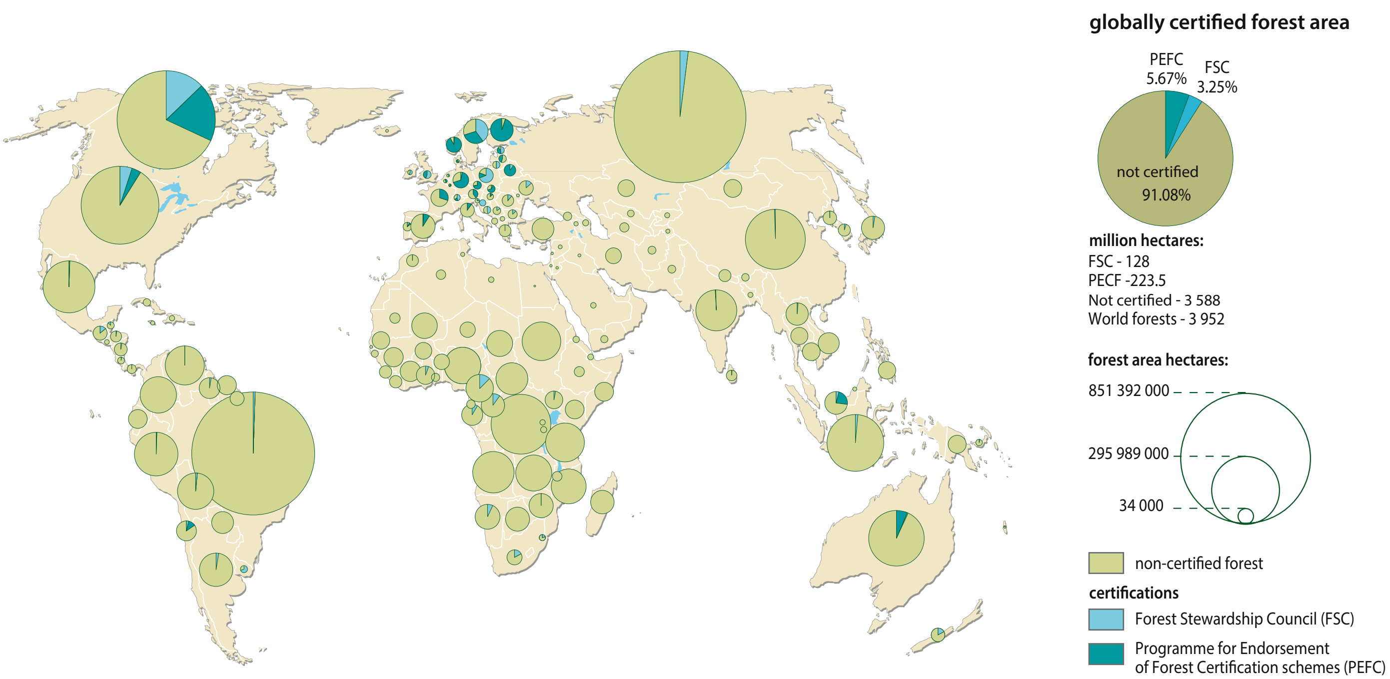


Figure 14: Forest certification by the Forest Stewardship Council (FSC) and the Programme for Endorsement of Forest Certification schemes (PEFC) in 2011. There has been an impressive increase in forest certification, largely in Europe and North America. *Source: FSC (2012), PEFC (2012)*

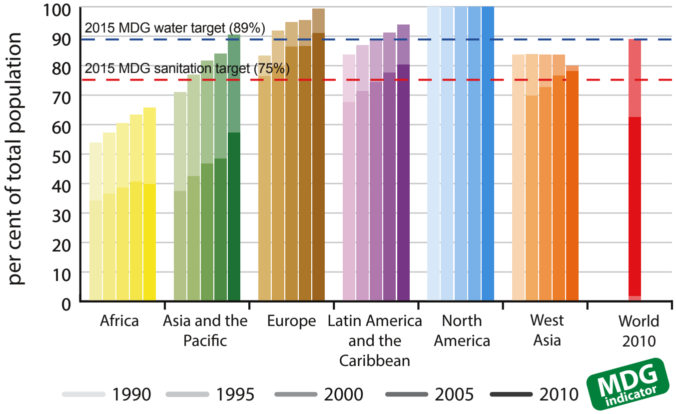


Figure 15: Proportion of the population with sustainable access to an improved water source (back rows) and to basic sanitation (front rows), 1990-2010. The global MDG target for safe drinking water has already been reached, unlike the target for basic sanitation. *Source: UNEP EDE, compiled from WHO/UNICEF (2011)*

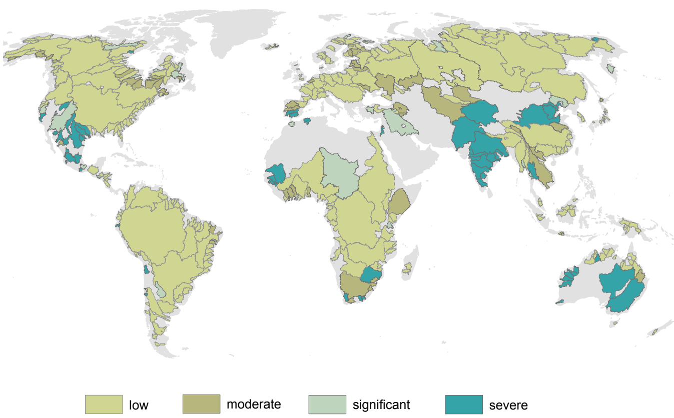


Figure 16: Annual average water scarcity in major river basins, 1996-2005. There is significant or severe blue water scarcity in 82 out of 405 river basins, affecting approximately 520 million people. *Source: Mekonnen* and *Hoekstra (2011)*

Water scarcity remains a significant problem in many parts of the world, as measured by the blue water scarcity indicator showing the proportion of groundwater and surface water consumed relative to sustainable water available for human use (after accounting for environmental flows) (Mekonenn and Hoekstra 2011) **(Figure 16)**. On average, out of 405 river basins studied, 264 basins with a total of 2.05 billion people are facing *low* water scarcity (<100%). However 0.38 billion people in 55 basins face *moderate* (100-150%), 0.15 billion in 27 basins face *significant* (150-200%) and 1.37 billion in 59 basins (particularly in India, Pakistan and China) face *severe* water scarcity (>200%).

Comprehensive data on water quality are very poor and only a few indicators can be provided. Levels of dissolved oxygen (DO) in surface waters illustrate the conditions of life in water bodies **(Figure 17)**.

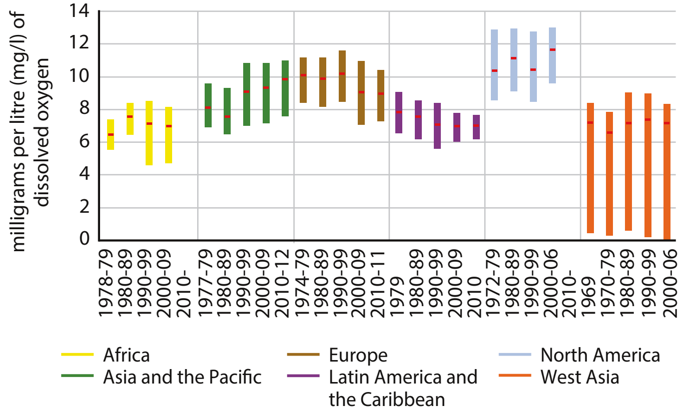


Figure 17: Levels of dissolved oxygen in surface waters, 1969-2010/11. The average is shown as red points, with surrounding uncertainty ranges in the colour of the region. Available data indicate that concentrations of dissolved oxygen are generally within the widely accepted limits of between 6 mg/l in warm water and 9.5 mg/l in cold water, as established for example in Australia, Brazil and Canada. These data are not representative of all waters in the regions, or of each decade, shown here. *Source: UNEP-GEMS/Water (2012)*

Biodiversity

The world's biodiversity continues to decline at alarming rates. Measured by the Red List Index (RLI), the status of all species groups with known trends is deteriorating in regard to their extinction threat, expressed in seven classes ranging from Least Concern to Extinct **(Figure 18)**. This threat is most severe for corals, due to increased bleaching, ocean acidification, and other effects linked to climate change, followed by amphibians (mainly threatened by the fungal disease *chytridiomycosis*), birds and mammals. The status of mammals has deteriorated most dramatically in South-East Asia, while birds are most threatened in Oceania, largely because of invasive species introduced by humans (UNEP-WCMC 2010). There are large gaps in systematic monitoring of biodiversity worldwide, but increasingly co-ordinated efforts are being made to address these gaps (Pereira et al. 2013)

Conservation and regulation have been effective in a number of cases. In the absence of conservation measures, the RLI shows a substantially steeper decline of at least 18 per cent for both birds and mammals. Globally, protected areas continue to increase and now cover nearly 13 per cent of land surface area, 7.2 per cent of coastal and marine areas (up to 12 nautical miles from land) and 1.6 per cent of the ocean (UN 2012b). The international community has set targets for 2020 of 17 per cent for terrestrial and 10 per cent for coastal and marine protected areas (CBD 2010). The need for protected areas to be managed effectively and equitably, as well as the need for proper data and indicators to monitor progress towards meeting these targets, is being emphasized.

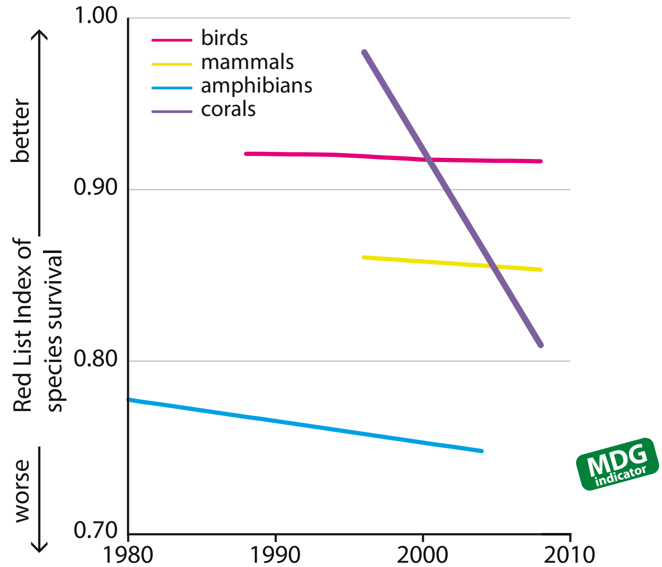


Figure 18: The IUCN Red List Index of Threatened Species, 1980-2010. The RLI measures the risk of extinction of species in seven classes, ranging from Least Concern to Extinct. A value of 1.0 indicates that species are not expected to become extinct in the near future, while 0 means a species is extinct. A small change in the level of threat can have significant impacts on species decline. *Source: IUCN (2012)*

Through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Trade Database and Dashboards, data on trade in CITES-listed species are being made available. Analysis of these data indicates an increase in reporting of trade by Parties to CITES. After many years of increases, the reported trade in wild and captive animals has decreased recently, with trade in captive animals becoming relatively more significant than trade in those taken from the wild **(Figure 19)**.

Environmental governance

If the world's response to environmental challenges was measured solely by the number of Conventions and other international environmental agreements that have been adopted, the situation would look promising. More than 500 of these agreements have been concluded since 1972, the year of the United Nations Conference on the Human Environment in Stockholm and of the creation of the United Nations Environment Programme (UNEP). They include landmark agreements on climate change, biological diversity, hazardous waste, trade in endangered species, and desertification. Collectively, they represent an extraordinary effort to co-ordinate countries' policies in order to achieve sustainable development. The number of MEAs has grown along with the number of countries (Parties) which are signatories. **Figure 20** shows that 90 per cent of United Nations Member States were signatories to the total set of 14 major MEAs in 2012.

A key indicator for environmental management activities by companies and other organizations is the number of certifications for the ISO 14001 environmental management standard. There were 267 500 such certifications in 2011, with large differences among regions **(Figure 21)**. Certification does not automatically imply that environmental performance is improved, but indicates

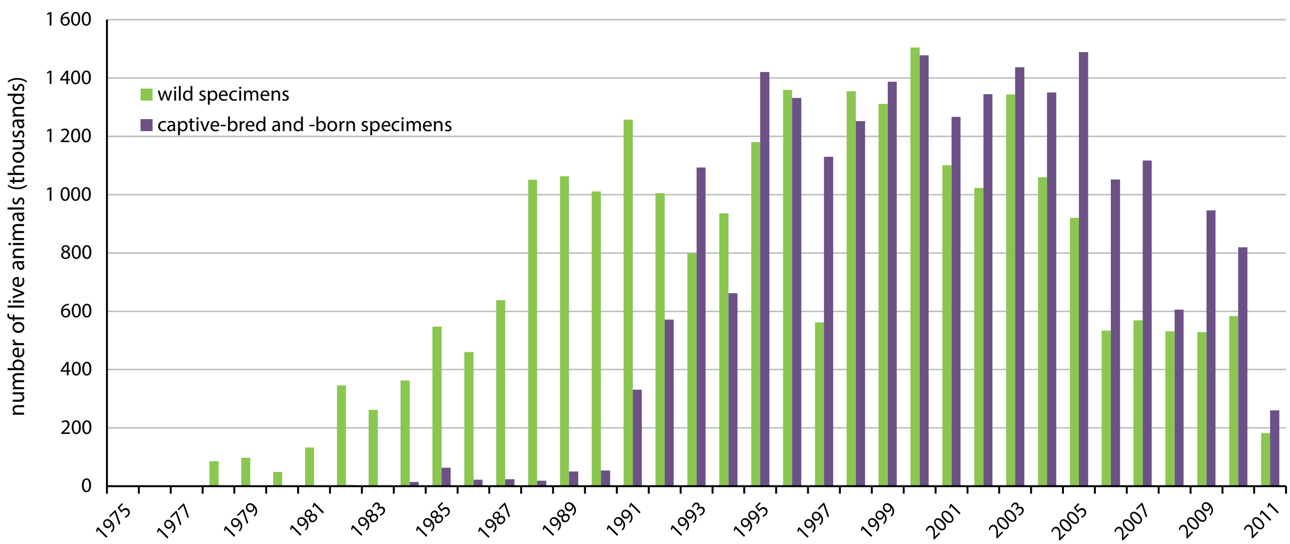


Figure 19: Trade in captive-bred and -born specimens compared with that in wild specimens, 1975-2011. *Source: CITES (2012)*

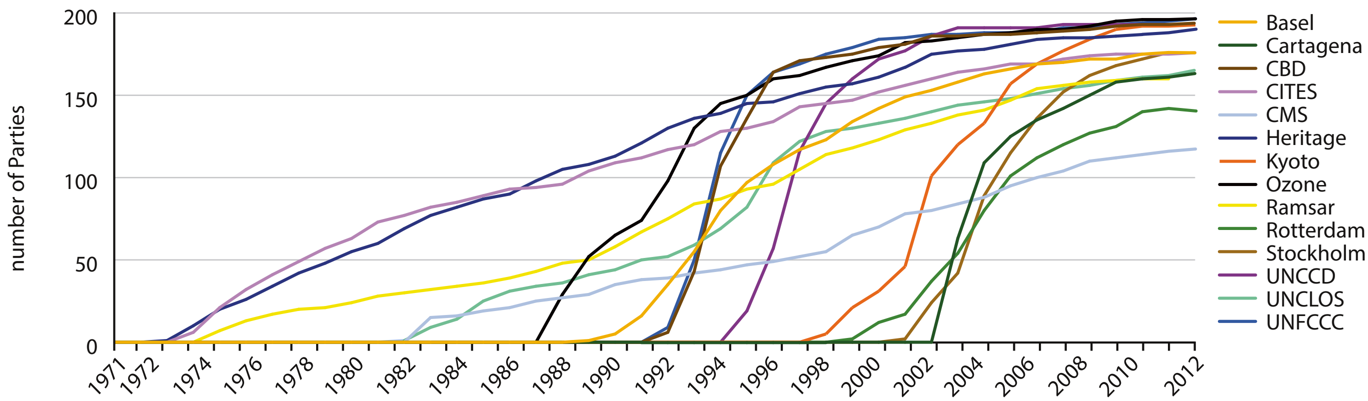


Figure 20: Number of Parties to Multilateral Environmental Agreements (MEAs), 1971-2012. Many MEAs and Conventions are reaching the maximum number of countries as signatories (Parties). Taking all 14 MEAs depicted here together, the number of Parties reached 90 per cent in 2012. Establishing and signing such agreements is a first important step, but does not mean the environmental problems addressed will be solved right away. *Source: UNEP EDE, compiled from various MEA secretariats* **(Table 1)**.

growing awareness by companies and organizations of the need to adopt environmental management systems. Despite an increasing number of legal texts and certifications, greater awareness and many expressions of good intentions, real progress in meeting environmental challenges has been much less comprehensive. There are a number of positive trends and some success stories, but the global environment continues to deteriorate in almost every respect (UNEP 2012a, 2012b).

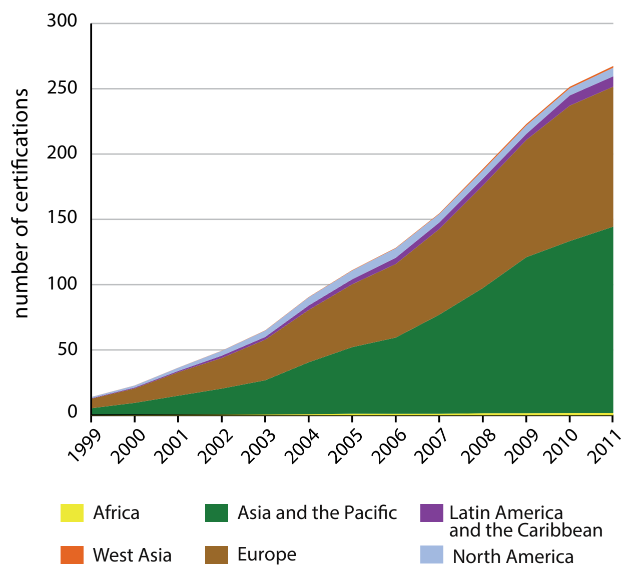


Figure 21: Number of ISO 14001 environmental management certifications, 1999-2011. ISO 14001 certification indicates that companies and other organizations are committed to adopt environmental management systems in terms of conforming to their own stated policies. Total certifications surpassed 250 000 in 2010, with the highest shares in Asia and the Pacific and Europe. *Source: ISO (2012)*

Looking ahead

There are few unequivocal success stories in the field of environment so far. One is the phase-out of the production of substances responsible for ozone depletion under the Montreal Protocol, which is expected to lead to recovery of the ozone layer in the coming decades. Another is meeting the MDG target to halve the proportion of people without sustainable access to safe drinking water source by 2015. Between 1990 and 2010, over 2 billion people gained access to improved drinking water sources, such as piped supplies and protected wells. However, international efforts continue to be required since millions of people still do not have sustainable access to safe drinking water, and the goal of halving the proportion of those without sustainable access to basic sanitation has not been met by far.

Growing awareness of environmental issues, along with political will and commitment to address these issues through international agreements and Conventions are positive signs and are necessary if policy action is to bring about structural changes in consumption and production patterns. Use of renewable energy sources is one encouraging development. Nevertheless, the global environment continues to deteriorate and all its components – from water and air to land and biodiversity – show signs of degradation.

What is not measured cannot be managed. Persistent data gaps and lack of proper environmental monitoring are among the challenges ahead. Internationally comparable data are the basis for tracking global environmental change, as well as for tracking progress towards the achievement of goals and objectives. Data gaps affect our ability to identify consistent, up-to-date trends in global environmental areas including chemicals and waste, land degradation, water quality, and biodiversity. Despite rapid advances in most countries with respect to internet access, remote sensing, social media and other tools and information technologies that can assist in monitoring and data collection, serious data gaps remain.

In addition to more and better data on changes in the environment, clear and measurable targets are needed in order to properly address issues of concern and increase the chances of success. Compared with the economic and social dimensions of sustainable development, the environmental domain is weak in terms of specific, quantified goals and targets. Apart from a few targets such as those related to climate change (for example, staying within the 2°C global warming limit) and biodiversity (for example, increasing protected areas by 2020), many goals and targets included in MEAs are set out in general terms and mainly demonstrate the signatories' good intentions. The most successful international environmental agreements are those that address well-defined issues with specific goals and quantified targets, which can be measured with sound and comprehensive data. Examples are the agreement on protected areas established in 1961 by the World Commission on Protected Areas (WCPA) and the 1987 Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer (UNEP 2011b).

Although there is a lack of specific goals, targets and metrics for achieving and tracking environmental sustainability and sustainable development in general, a number of frameworks and sets of indicators and indices have been proposed since 1992. In 1995 a set of 134 national indicators of sustainable development was formulated, largely following Agenda 21 (the action plan for sustainable development which was a product of the UN Conference on Environment and Development in Rio de Janeiro in 1992). Revised in 2001 and 2006, this UN Commission on Sustainable Development (UNCSD) set comprises 96 indicators, of which 50 are considered part of a core set (UN 2007). Frameworks for the collection of statistical data and for economic-environmental accounting have also been developed to assist countries in developing, organizing and applying environmental and related socio-economic information, notably the Framework for the Development of Environment Statistics (FDES) and the System for Environmental-Economic Accounting. Several composite indices have been developed to measure different aspects of sustainable development, such as the well-known Human Development Index (HDI) and the Ecological Footprint, and the more recent Inclusive Wealth Index, which attempts to measure wealth and growth beyond gross domestic product (GDP) metrics and better reflect the depletion of natural resources. Various proposals are being made to measure progress towards green growth and a green economy, focusing on indicators for economic transformation, resource efficiency, and well-being, and providing guidance on policy reforms and investments aimed at achieving a green transformation of key economic sectors as a means of advancing towards sustainable development. Rio+20 considered a green economy one important way of achieving sustainable development and providing options for policymaking, but without being a rigid set of rules.

One of the main outcomes of Rio+20 was the agreement by countries to launch a process to develop a set of Sustainable Development Goals, which will build upon the Millennium Development Goals and converge with the post 2015 development agenda. The SDGs should consist of concrete goals and targets, which are one of the main strengths of the MDG framework, but be reorganized along four key dimensions of a more holistic approach: inclusive social development; inclusive economic development; environmental sustainability; and peace and security (UN 2012c). They should apply to all countries, and be based on the fundamental principles of human rights, equality and sustainability – building on the principles of the year 2000 Millennium Declaration and the three pillars of sustainable development. A process has begun to establish an "inclusive and transparent intergovernmental process open to all stakeholders, with a view to developing global sustainable development goals to be agreed by the General Assembly" (UN 2012d). Lessons learned from the development of environmental indicators for MDG goal 7 on environmental sustainability, and from other experience, could be invaluable to further guide on this process.

The European Space Agency (ESA) Envisat satellite is the largest Earth observation craft ever built and has been continuously observing and monitoring land, atmosphere, ocean and ice caps since 2002. After ten years of service, ESA formally announced the end of Envisat's mission in May 2012. *Credit: ESA*

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Table 1: Key environmental indicators data (latest update 2012)

Key environmental indicator	Latest year on record	World	Africa	Asia and the Pacific	Europe	Latin America and the Caribbean	North America	West Asia	Unit of measurement
Consumption of ozone-depleting substances	2011	41 053	2 067	28 891	-26	4 836	1 686	3 598	ODP tonnes
Carbon dioxide emissions	2009	32.07	1.20	14.52	6.14	1.60	5.81	1.05	billion tonnes of CO_2
Carbon dioxide emissions per capita	2009	4.7	1.2	3.7	7.4	2.7	16.7	8.1	tonnes of CO_2 per caita
Forest harvest rates	2011	0.8	1.0	2.2	0.7	0.3	0.7	4.1	ratio
Total fish catch	2010	88.1							million tonnes
Area protected to maintain biological diversity relative to total surface area	2010	12.0	10.1	9.9	10.2	19.3	9.5	17.1	per cent of total territorial area
Municipal waste collection	2009			310 (2008)	383	119 (2007)	234	32	million tonnes
Access to safe drinking water	2010	89	65.7	90.5	99.0	94.2	99.1	80.0	per cent of total population
Access to basic sanitation	2010	63	39.9	57.4	90.9	80.1	100.0	78.3	per cent of total population
Number of certifications of the ISO 14001 standard	2011	267.5	1.7	143	107	7.9	6.6	1.3	number of certifications (thousands)

CITES Species Trade (2011) number of wild animals (thousand)	
Captive-bred and -born animals	259 813
Wild animals	182 772

Renewable energy 2010 index (1990 = 100)	
Solar photovoltaics	137 150
Solar thermal	765
Wind	8 799
Biofuels - biogasoline and biodiesel	2 356

Primary energy supply 2010 oil equivalent (thousand million tonnes)	
Crude oil and feedstocks	4.16
Coal and coal products	3.51
Gas	2.73
Combustible renewables and waste	1.28
Nuclear	0.72
Hydro	0.30
Geothermal	0.06
Solar/wind/other	0.05
Total supply (TPES):Million tonnes oil eq.	12.76

MEAs 2012 number of Parties	
Basel	176
Cartagena	164
CBD	193
CITES	177
CMS	118
Heritage	190
Kyoto	192
Ozone	197
Ramsar	163
Rotterdam	147
Stockholm	178
UNCCD	194
UNCLOS	164
UNFCCC	195

MEAs data 2012

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
http://www.basel.int/Countries/StatusofRatifications/PartiesSignatories/tabid/1290/Default.aspx
Cartagena Protocol on Biosafety to the Convention on Biological Diversity http://bch.cbd.int/protocol/
CBD http://www.biodiv.org/world/parties.asp
CITES http://www.cites.org/eng/disc/parties/
CMS http://www.cms.int/about/part_lst.htm
Heritage Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage). http://whc.unesco.org/en/statesparties/
Kyoto Protocol to the UNFCCC. http://unfccc.int/essential_background/kyoto_protocol/status_of_ratification/items/2613.php
Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat.
http://www.ramsar.org/cda/en/ramsar-about-partiescontracting-parties-in-20715/main/ramsar/1-36-23%5E20715_4000_0__
Rotterdam Convention on the Prior Informed Consent Procedure for Certain hazardous Chemicals and Pesticides in international trade (PIC)
http://www.pic.int/Countries/Parties/tabid/1072/language/enS/Default.aspx
Ozone Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer
http://ozone.unep.org/new_site/en/vienna_convention.php
Stockholm Convention on Persistent Organic Pollutants (POPs) http://www.pops.int/documents/signature/signstatus.htm
UNCCD http://www.unccd.int/convention/ratif/doeif.php
UNCLOS (2013) http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm#
UNFCCC http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php