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1 The state of the environment in Europe

Europe relies heavily on natural capital and ecosystems at home and abroad

The Europe addressed in this report is home to around 600 million people and covers about 5.85 million km^2. The biggest shares of both population and land area are in the European Union (EU) — around 4 million km^2 and close to 500 million people. With an average of 100 people per km^2, Europe is one of the most densely populated regions of the world; some 75 % of the total population lives in urban areas ([1]) ([2]).

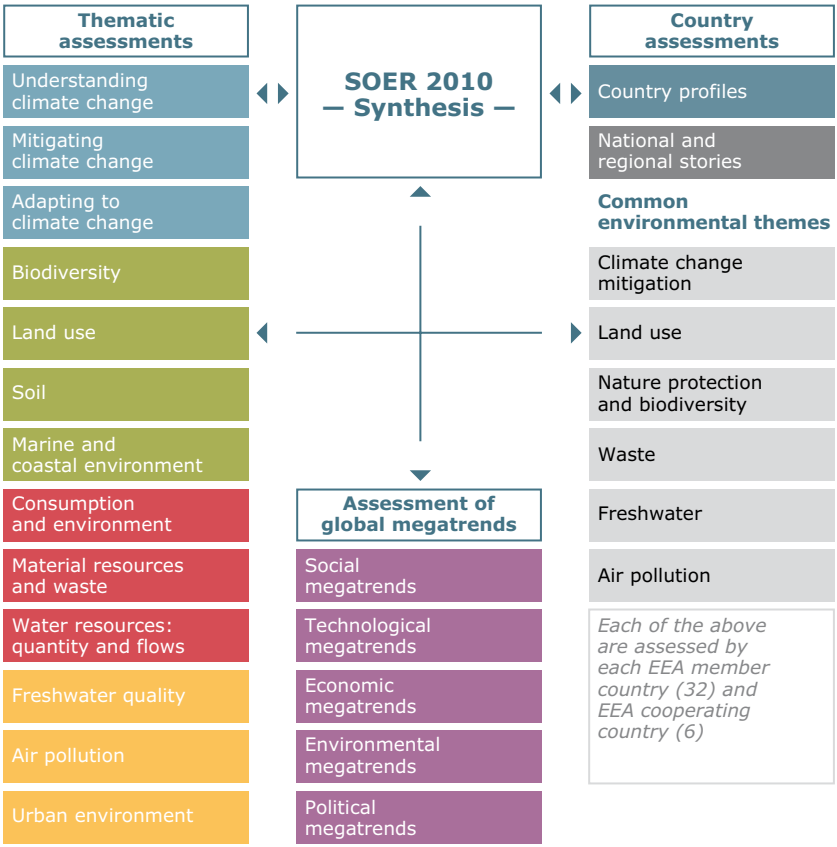
Europeans depend heavily on the stocks of natural capital and flows of ecosystem services that lie within and beyond Europe's borders. Two fundamental questions arise from this dependency. Are the stocks and flows today being used sustainably to supply essential benefits, such as food, water, energy, materials, as well as climate and flood regulation? Are today's environmental resources, i.e. air, water, soil, forests, biodiversity, secure enough to be able to sustain people and economies in good health in the future?

Access to reliable up-to-date information about the environment provides a basis for action

To answer such questions, citizens and policymakers require accessible, relevant, credible, and legitimate information. According to various polls, people concerned about the state of the environment see that providing more information on environmental trends and pressures is one of the most effective ways of tackling environmental problems, along with fines and strong enforcement ([3]).

The aim of the European Environment Agency (EEA) is to provide such timely, targeted, relevant and reliable information on the environment to support sustainable development and help achieve significant and measurable improvements in Europe's environment ([4]). A further requirement is that the EEA publishes

Figure 1.1 Structure of *The European environment — State and outlook 2010* (SOER 2010) (A)



Note: For additional information, please visit www.eea.europa.eu/soer.

Source: EEA.

regular assessments of the state and outlook for the environment in Europe: this report is the fourth in the series ([5]) ([6]) ([7]).

The European environment — State and outlook 2010 (SOER 2010) ([A]) provides an assessment of the most up-to-date information and data from 32 EEA member countries and six cooperating countries in the Western Balkans. It also addresses four regional seas: the North-east Atlantic, Baltic, Mediterranean and Black Seas.

Being a European-level report, it complements national-level 'state of the environment' reports across Europe ([B]). Its aim is to provide analyses and insights into the state of, trends in and prospects for Europe, plus an indication of where gaps in knowledge and uncertainties exist, in order to enhance discussions and decisions about critical policies and societal issues.

Reviewing the state of the environment in Europe reveals considerable progress, but challenges remain

There have been many encouraging trends in the environment over the past decade: European greenhouse gas emissions have decreased; the share of renewable energy sources has increased; some air and water pollution indicators show significant improvements across Europe, although this has not yet necessarily resulted in good air and water quality; and materials use and waste generation, although still increasing, are growing at a slower rate than the economy.

In some areas, environmental targets have not been achieved. The target of halting biodiversity loss in Europe by 2010, for example, will not be reached, although large areas across Europe have been designated as protected areas under the EU Habitats and Birds Directives ([8]) ([9]). Also, the overarching target to limit climate change to temperature increases below 2 °C globally during this century is unlikely to be met, in part because of greenhouse gas emissions from other parts of the world.

An indicative summary table of the main trends and progress over the past ten years where EU policy targets have been established shows a mixed picture. Only a few indicators are included to highlight key

Table 1.1 Which countries and regions does this report address?

Region	Sub-region	Sub-group	Countries
EEA member countries (EEA-32)	EU-27	EU-15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, the United Kingdom
		EU-12	Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia
	EU candidate countries		Turkey
	European Free Trade Association (EFTA) countries		Iceland, Liechtenstein, Norway, Switzerland
EEA cooperating countries (Western Balkans)	EU candidate countries		Croatia, the former Yugoslav Republic of Macedonia
	EU potential candidate countries		Albania, Bosnia and Herzegovina, Montenegro, Serbia

Note: EEA-38 = EEA member countries (EEA-32) + EEA cooperating countries (Western Balkans).

For practical reasons, the groups used are based on established political groupings (as of 2010) rather than environmental consideration only. Thus there are variations in environmental performance within the groups and substantial overlaps between them. Where possible, this has been highlighted in the report.

trends here; the more detailed analyses that follow show that in some instances, such as waste and greenhouse gas emissions, there are substantial differences by economic sector and country.

Several key environmental issues are not shown in this summary table, either because they lack explicit targets or because it is too early to measure progress against more recently agreed targets. Such issues include, for example, noise, chemicals and hazardous substances, natural and technological hazards. They are, however, considered in subsequent chapters of this report and the results from their analyses have contributed to the conclusions of this report.

The overall emerging picture of progress towards meeting environmental targets, confirms the findings of previous European 'state of the environment' reports, namely that there have been considerable improvements in many areas, but a number of major challenges remain. This picture is also reflected in recent *Annual Environment Policy Reviews* by the European Commission in which up to two-thirds of the 30 environmental indicators selected show a poor performance or worrying trend, while the remainder point to either good performance or at least mixed progress towards environmental targets ([10]) ([11]).

Links between environmental pressures point to environmental systemic risks

This report describes the state of and trends in the environment in Europe as well as prospects for the future along a central thread of four environmental issues: climate change; nature and biodiversity; natural resources and waste; and environment, health and quality of life. These four issues have been chosen as entry points as they are the priorities of current European strategic policies in the EU 6th Environment Action Programme ([J]) ([12]) and the EU Strategy for Sustainable Development ([13]), and thereby help to create a direct link with the European policy framework.

The analyses point to the fact that today's understanding and perception of environmental challenges are changing: no longer can they be seen as independent, simple and specific issues. Rather, the challenges are increasingly broad-ranging and complex, part of a web

Table 1.2 Indicative summary table of progress towards meeting environmental targets or objectives, and highlights of related trends over the past 10 years ([c])

Environmental issue	EU-27 target/objective	EU-27 — on track?	EEA-38 — trend?
Climate change			
Global mean temperature change	To limit increases to below 2 °C globally ([a])	☒ ([D])	(↗)
Greenhouse gas emissions	To reduce greenhouse gas emissions; by 20 % by 2020 ([b])	☑ ([E])	↘
Energy efficiency	To reduce primary energy use; by 20 % by 2020 vs. business-as-usual ([b])	☐ ([E])	↗
Renewable energy sources	To increase energy consumption from renewables; by 20 % by 2020 ([b])	☐ ([E])	↗
Nature and biodiversity			
Pressure on ecosystems (from air pollution, e.g. eutrophication)	Not to exceed critical loads of eutrophying substances ([c])	☒	→
Conservation status (safeguard EU's most important habitats and species)	To achieve favourable conservation status, set up Natura 2000 network ([d])	☐ ([F])	→
Biodiversity (terrestrial and marine species and habitats)	To halt the loss of biodiversity ([e]) ([f])	☒ (terrestrial) ☒ (marine)	(↘) (↘)
Soil degradation (soil erosion)	To prevent further soil degradation and preserve its functions ([g])	☒ ([G])	(↗)
Natural resources and waste			
Decoupling (resource use from economic growth)	To decouple resource use from economic growth ([h])	☐	↗
Waste generation	To substantially reduce waste generation ([h])	☒ ([H])	(↗)
Waste management (recycling)	Several recycling targets for different specific waste streams	☑	↗
Water stress (water exploitation)	To achieve good quantitative status of water bodies ([i])	☐ ([I])	→

Table 1.2 Indicative summary table of progress towards meeting environmental targets or objectives, and highlights of related trends over the past 10 years ([c]) (cont.)

Environmental issue	EU-27 target/objective	EU-27 — on track?	EEA-38 — trend?
Environment and health			
Water quality (ecological and chemical status)	To achieve good ecological and chemical status of water bodies ([i]) ([j])	☐ ([i])	→
Water pollution (from point sources, and bathing water quality)	To comply with bathing water quality, urban wastewater treatment ([k]) ([l])	☑	↘
Transboundary air pollution (NO_x, NMVOC, SO_2, NH_3, primary particles)	To limit emissions of acidifying, eutrophying and ozone precursor pollutants ([c])	☐	↘
Air quality in urban areas (particulate matter and ozone)	To attain levels of air quality that do not give rise to negative health impacts ([m])	☒	→

Legend		
Positive developments	**Neutral developments**	**Negative developments**
↘ Decreasing trend	→ Stable	(↘) Decreasing trend
↗ Increasing trend		(↗) Increasing trend
☑ EU on track (some countries may not meet target)	☐ Mixed progress (but overall problem remains)	☒ EU not on track (some countries may meet target)

Source: EEA ([c]).

of linked and interdependent functions provided by different natural and social systems. This does not imply that the environmental concerns which emerged in the previous century, such as how to reduce greenhouse gas emissions or halt biodiversity loss, are no longer important. Rather, it points towards an increased degree of complexity in the way we understand and respond to environmental challenges.

The report seeks to shed light from various viewpoints on key characteristics of the complex links between environmental issues. It does so by providing a closer analysis of the links between different environmental challenges, as well as between environmental and sectoral trends and their respective policies. For example, reducing the rate of climate change requires not only the reduction of greenhouse gas emissions from power plants, but also the reduction of more diffuse emissions from transport and agriculture as well as changes in household consumption patterns.

Taken together, trends in Europe and globally point towards a number of systemic environmental risks, such as the potential loss or damage to an entire system rather than a single element, which can be made worse by the many interdependencies between them. Systemic risks can be triggered by sudden events or built up over time, with the impact often being large and possibly catastrophic ([14]).

A number of underlying developments in Europe's environment display key characteristics of systemic risk:

- many of Europe's environmental issues, such as climate change or biodiversity loss, are linked and have a complex and often global character;

- they are closely linked to other challenges, such as unsustainable resource use, that span the societal and economic spheres and undermine important ecosystem services;

- as environmental challenges have become more complex and more profoundly linked to other societal concerns, the uncertainties and risks associated with them have increased.

Table 1.3 Evolution of environmental issues and challenges

In the spotlight during	Climate change	Nature and biodiversity	Natural resources and waste	Environment and health
1970s/1980s (until today)		Protect selected species and habitats.	Improve waste treatment to control hazardous substances in waste; reduce impact from waste disposal; reduce impacts from landfills and spills.	Reduce emissions of specific pollutants into air, water, soil; improve wastewater treatment.
1990s (until today)	Reduce greenhouse gas emissions from industry, transport and agriculture; increase share of renewable energy.	Establish ecological networks; manage invasive species; reduce pressure from agriculture, forestry, fisheries and transport.	Recycle waste; reduce waste generation through prevention approach.	Reduce emissions of pollutants from common sources (such as transport-related noise and air pollution) into air, water, soil; improve regulation of chemical substances.
2000s (until today)	Establish economy-wide approaches, provide behavioural incentives and balance drivers of consumption; share global burdens of mitigation and adaptation.	Integrate ecosystem services linked to climate change, resource use and health; account for use of natural capital (i.e. water, land, biodiversity, soil) in decisions on sectoral management.	Improve efficiency of resource use (such as materials, food, energy, water) and consumption in the face of increasing demand, reduced resources and competition; cleaner production.	Reduce people's combined exposure to harmful pollutants and other stressors; better link human and ecosystem health.

Increasing degree of complexity

Source: EEA.

The report does not present any warnings of imminent environmental collapse. However, it does note that some local and global thresholds are being crossed, and that negative environmental trends could lead to dramatic and irreversible damage to some of the ecosystems and services that we take for granted. In other words, the current insufficient rate of progress observed over the past few decades in addressing environmental issues may severely undermine our ability to deal with potential future negative impacts.

Looking at the state of the environment and future challenges from different perspectives

Subsequent chapters assess, in more detail, key trends in the four environmental priority issues already mentioned.

Chapters 2 to 5 provide an assessment of the state of, trends in and prospects for each of these issues.

Chapter 6 reflects on the many direct and indirect connections across issues from the perspectives of natural capital and ecosystem services, focusing on land, soil and water resources.

Chapter 7 uses another lens by looking out to the rest of the world in terms of key socio-economic and environmental megatrends that can be expected to affect Europe's environment.

The final chapter, Chapter 8, reflects on the findings of the previous chapters and their implications for future environmental priorities. It does this through an additional series of lenses; the lens of managing natural capital and ecosystem services, the lens of a green economy, the lens of strengthened integrated policies and the lens of state-of-the-art information systems, and concludes that:

- better implementation and further strengthening of environmental protection provide multiple benefits;
- dedicated management of natural capital and ecosystem services increases resilience;

- more integrated actions across policy domains can help deliver positive environmental outcomes with co-benefits for the wider economy;

- sustainable natural capital stewardship requires a transition towards a greener, more resource-efficient economy.