

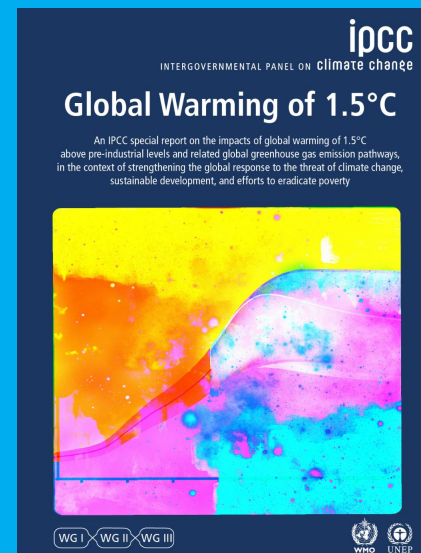
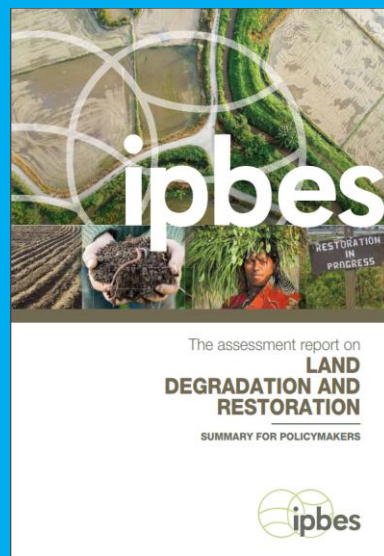
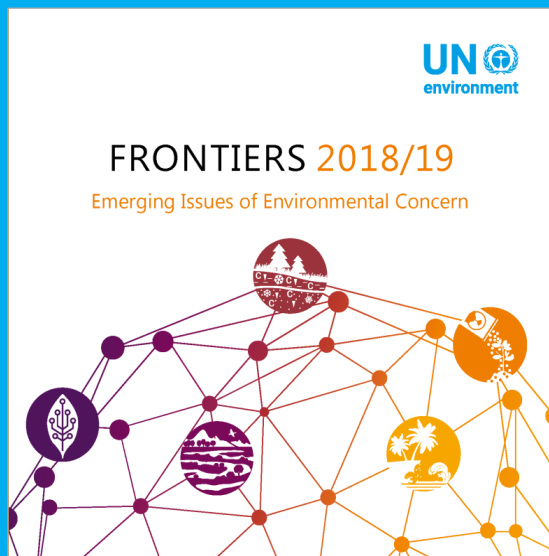


State of the Global Environment

1. latest science – 2. policy implications – 3. the way forward



Overview of scientific findings from the sixth Global Environment Outlook (GEO-6) and other major assessments



The GEO-6

2,5 years of work; 146 authors, 78 members of advisory bodies, 41 review editors

From more than 70 countries (G & R balance)

301 UN reviewers; More than 1,000 technical reviewers

364 Intergovernmental reviewers

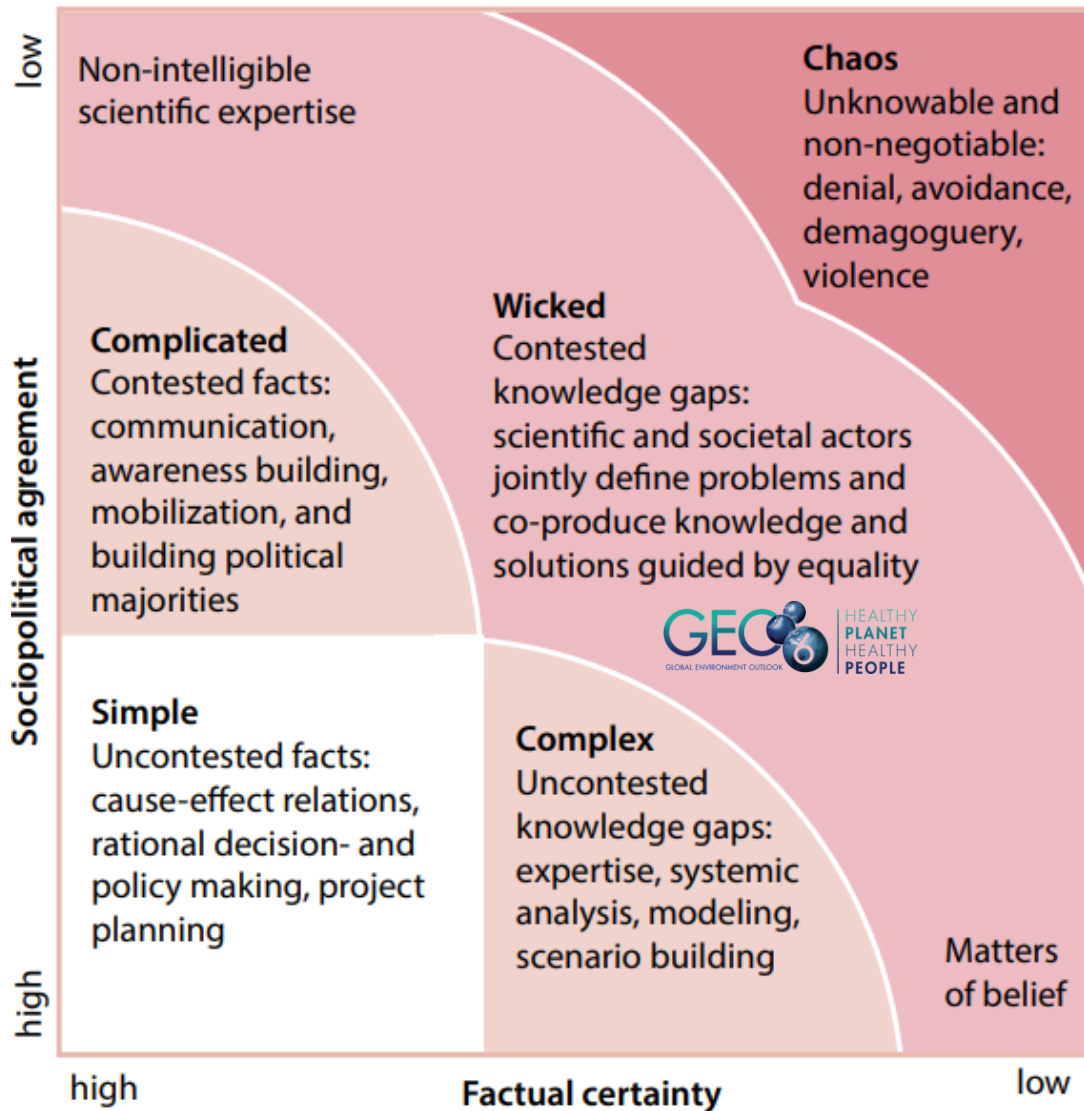
5 review periods, 2 of which were intergovernmental reviews

Summary for Policymakers

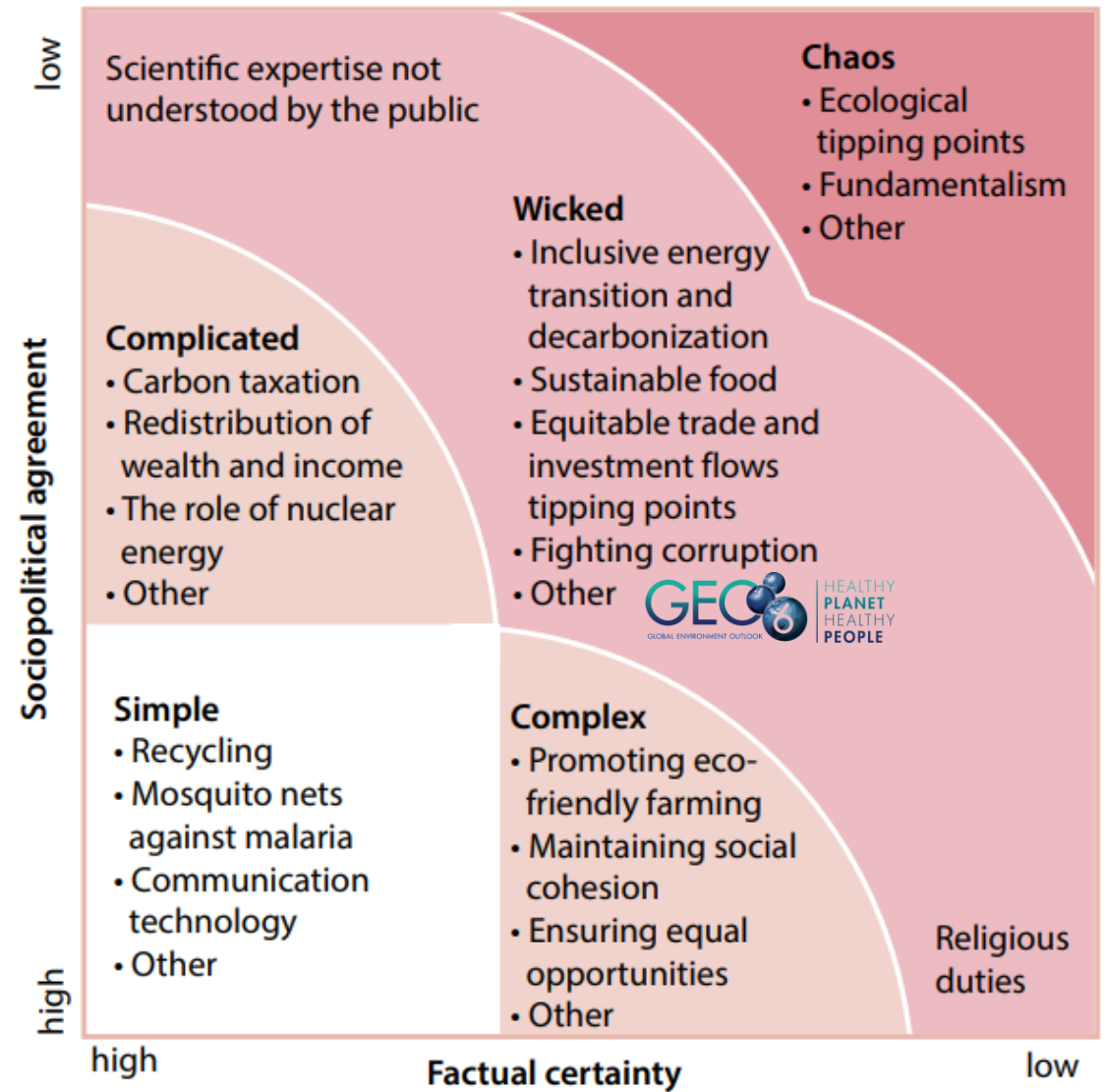
Negotiated in January, 2019;
95 countries, 250 participants, 4 days;
37 page summary plus 'Key Messages'



Sustainable development challenges



Examples of policy fields



► *Intergovernmental scientific assessments* – such as the Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the International Assessment of Agricultural Knowledge, Science and Technology for Development or the Global Environment Outlook;

Thanks to donors and partners

- Not possible to conduct a project of this size without significant contributions from funders and partners
- Expertise and time from many authors
- Their institutions also allowed them time away from their main activities



GEO-6 Funders

Producing an assessment of this scale requires many generous contributions. The following organizations provided funding directly or indirectly to the sixth *Global Environment Outlook*: The Government of Norway, the European Union, the Governments of Italy, Singapore, China, Mexico, Switzerland, Denmark, Egypt and Thailand. Together with UN Environment's Environment Fund and Regular Budget, these contributions allowed for the production of GEO-6 and its accompanying Summary for Policymakers, as well as subsequent outreach activities.



This project is co-funded by the European Union



Ministry of the Environment and Water Resources



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office for the Environment FOEN



Ministry of Environment and Food of Denmark
Environmental Protection Agency



Ministry of Environment



GEO-6 Partners

GEO-6 also benefited from the generous contributions of several partners, including: GRID-Arendal, World Conservation Monitoring Centre (WCMC), The Centre for Environment and Development in the Arab Region and Europe (CEDARE), The Big Earth Data Science Engineering Program (CASEarth), the European Space Agency (ESA), the Netherlands Environmental Assessment Agency (PBL), the Freie Universität Berlin and the Massachusetts Institute of Technology (MIT).



PBL Netherlands Environmental Assessment Agency

Freie Universität Berlin



MIT CENTER FOR COLLECTIVE INTELLIGENCE



State of the Global Environment

1. latest science – 1.1 key messages



KEY MESSAGES emerging from all reports:

01. The use of natural resources has more than tripled from 1970 and continues to grow.



‘under current trends, the world’s social and natural biophysical systems cannot support the aspirations for universal human development that is embedded in the SDGs (GSDR, 2019 – 1.3)’

We need to radically transform our production and consumption systems, to preserve the basis for our development: the global environment (land, water, climate, biodiversity, clean air, minerals, oceans, etc.)

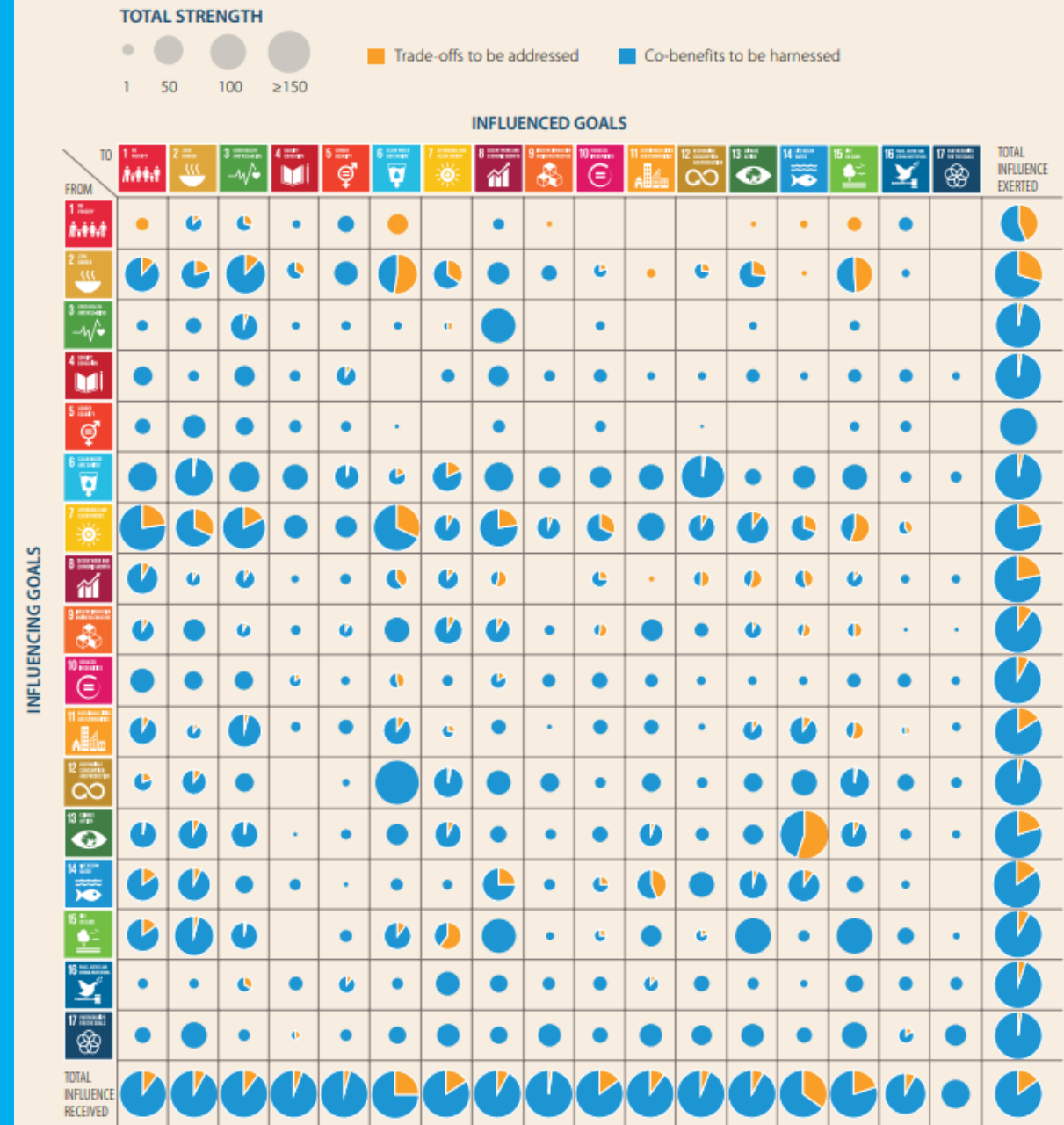
Small incremental changes to the Business As Usual will NOT be sufficient – ‘breaking away from the current practice of growing first and cleaning up later’

Change needs to be more ambitious, rapid, systemic and transformational

Other Key Messages

- A more integrated approach that addresses multiple goals simultaneously is needed
- Pollution, Climate Change and Biodiversity Loss are the three major interlinked environmental challenges to meet SDGs
- Tipping points coming, transformational change needed *yesterday* (GDP 3X increase in 2050)!
- Will and way: more solutions than problems, significant co-benefits in the context of SDGs
- Science and Technology matters

Interactions among Sustainable Development Goals



GSDR Focus

- Strengthening human well-being and capabilities
- Shifting towards **sustainable and just economies**
- Building sustainable **food systems and healthy nutrition patterns**
- Achieving energy **decarbonization** with universal access to energy
- Promoting sustainable urban and peri-urban development
- Securing the **global environmental commons**
- Science and technology for sustainable development
- Not incremental change but **transformation**



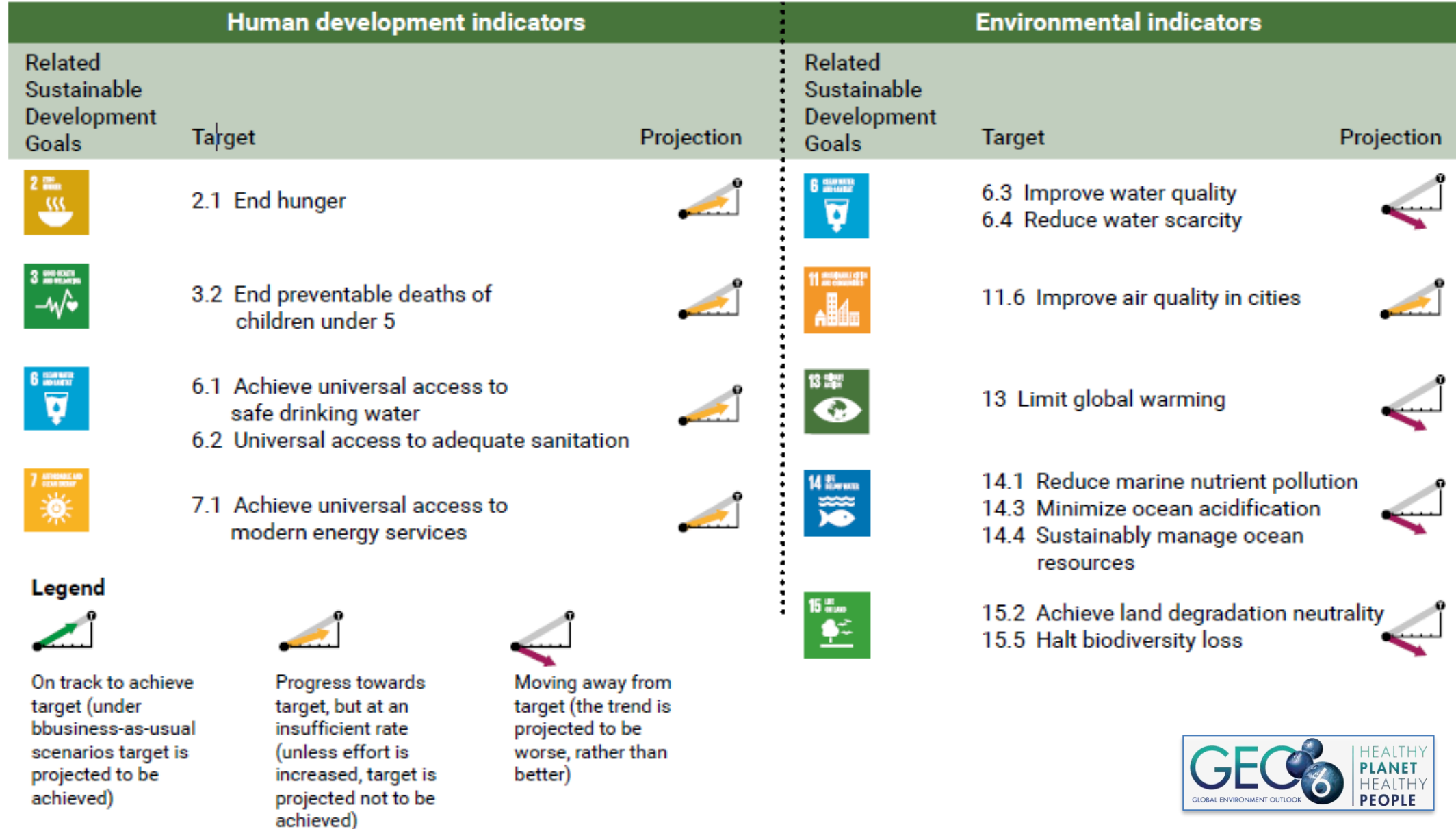


State of the Global Environment

1. latest science – 1.2 global issues



Figure SPM.8. Projected global trends in target achievement for selected Sustainable Development Goals and internationally agreed environmental goals

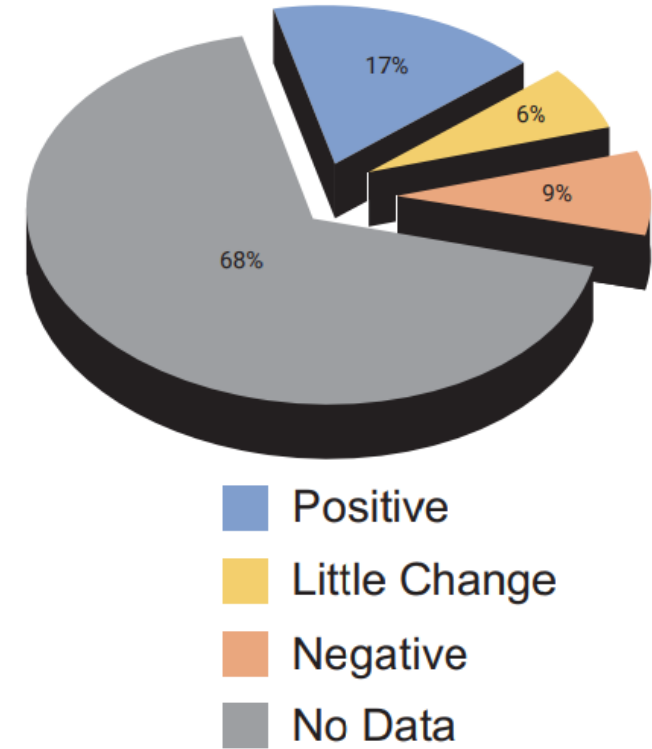
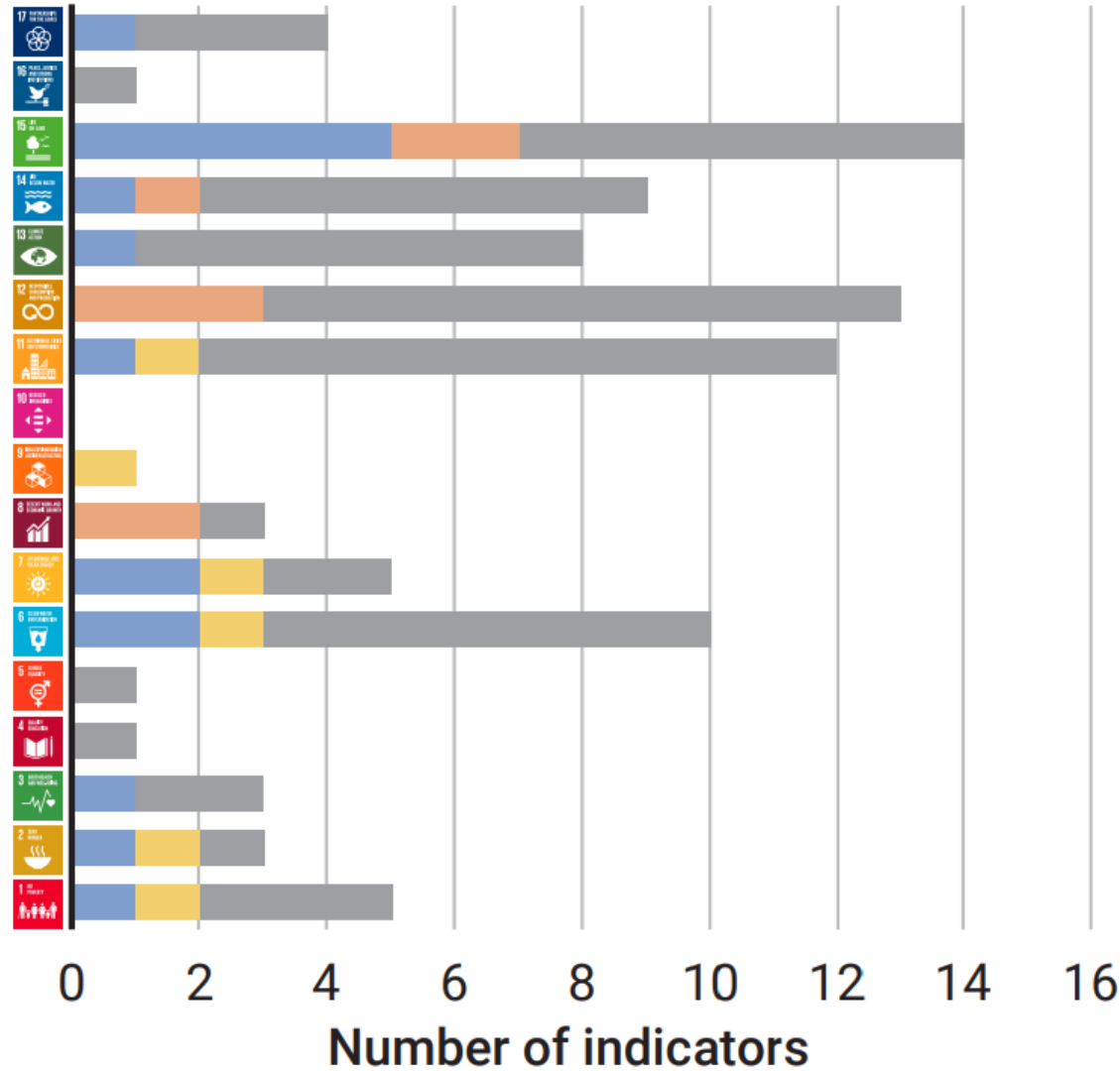


Outlook for the future

(current policies)

- Improvements in human development, but insufficient to meet environmental dimension of SDGs and IAEGs – environmental health risks remain prominent in 2030.
- Further degradation in nearly all environmental areas– from climate change to biodiversity loss to water scarcity, land degradation and ocean acidification.
- Failure to act now will lead to ongoing and potentially irreversible impacts on the environment and human health.

Figure 2. SDG Tree



Drivers of Environmental Change

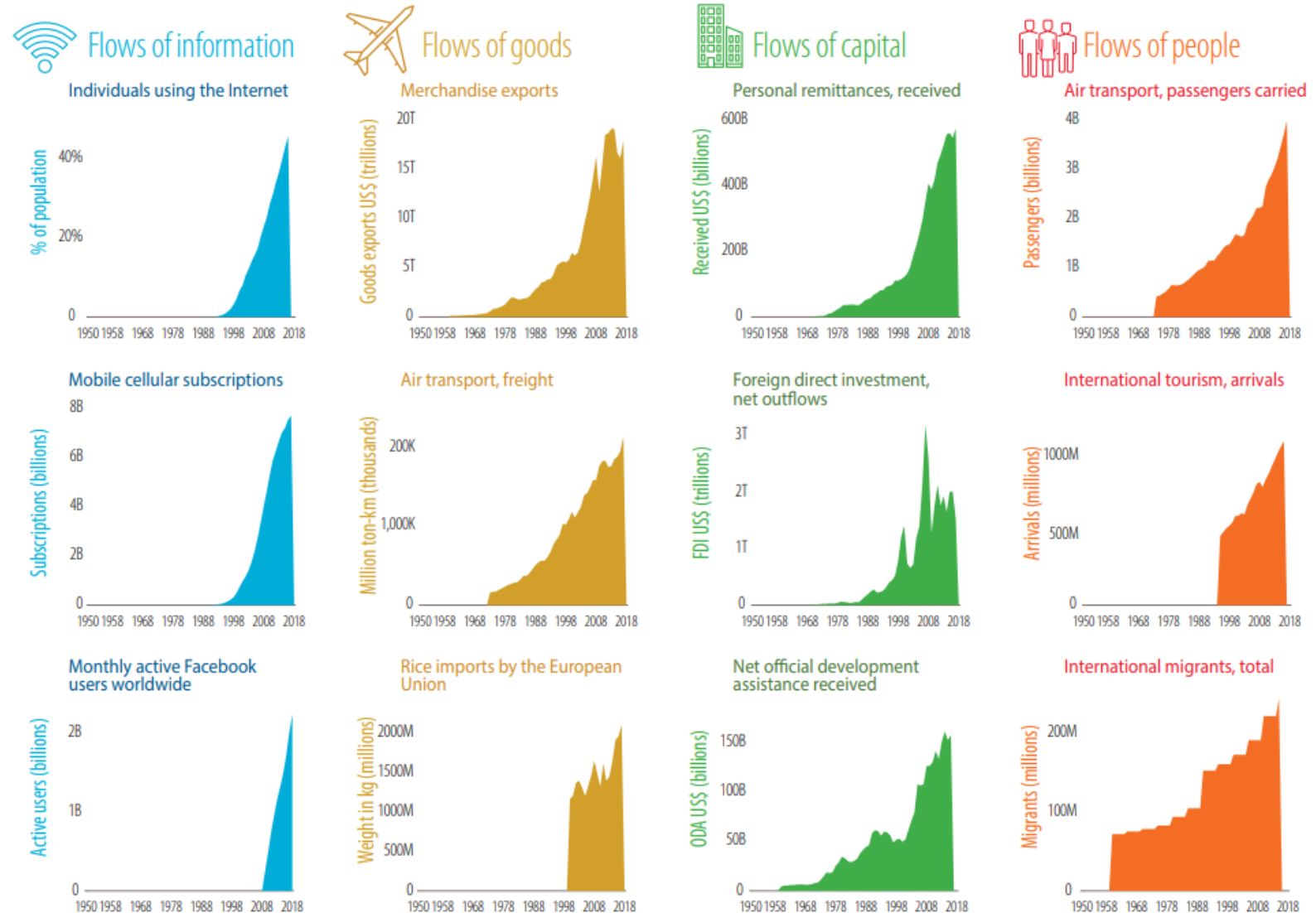
- **Population** - 9-10 billion 2050
- **Urbanization** – 66% in cities 2050
- **Economy** – eradicate poverty, hunger and manage consumption
- **Technology** – positive and negative to environment (risks and solutions) – *Remote Sensing and IT*
- **Climate** – hotter, too much/little water, sea level rise, disasters and conflicts...



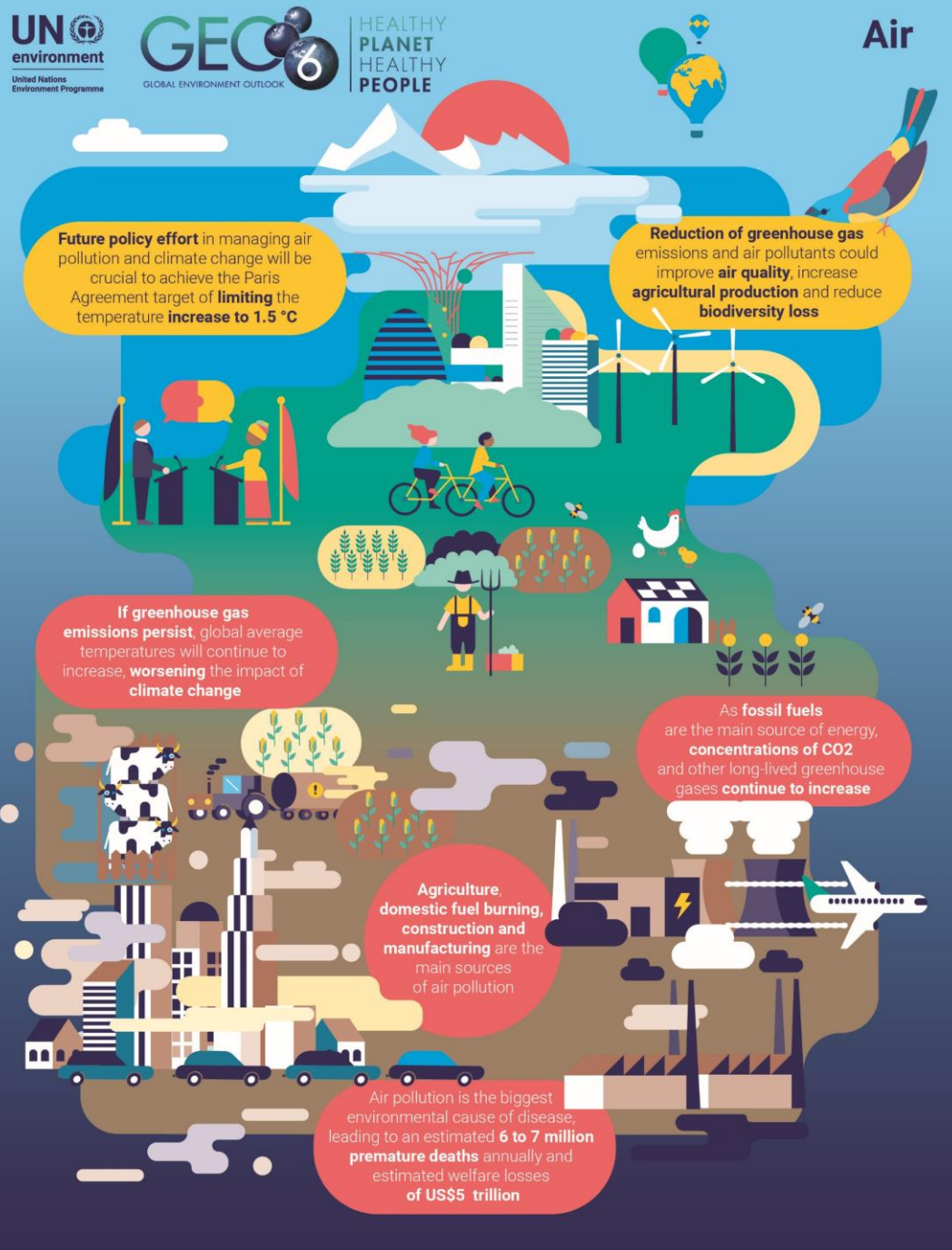
Our world is increasingly inter-connected:

Figure 1-1
Cross-national flows of information, goods, capital and people

Cross-national flows of information, goods, capital and people increased dramatically in the last decades, underpinning a world that is more interconnected than ever.²²



(Source: GSDR, 2019)



Air and Water

- **Air Pollution** – 6-7 MN premature deaths and cost of \$5 TN/Year
- **GHGs**, major cause of climate change
- **Water Disease** –2.3 BN no access to safe sanitation and 1.4 MN deaths due to pathogens in drinking water
- **Water ecosystem** – 40% of global wetlands lost 1997-2011. Population of water species declined by 81% 1970-2012

Land and Soil

- **Food production** –need 50% more food for 10 billion in 2050 (land/yield increase)
- **Monoculture crops** –increase productivity but lose agrobiodiversity
- **Animal protein** – 77% agricultural land for meat production
- **Food waste** –1/3 food wasted/year
- **Deforestation** – The deforestation rate decreased to 6.5 MN ha/yr, planted forests increased to 3.2 million ha/yr
- **Urbanization** – Urban area grown by 2.5 times since 1975, accounting for 7.6 per cent of land use in 2015.

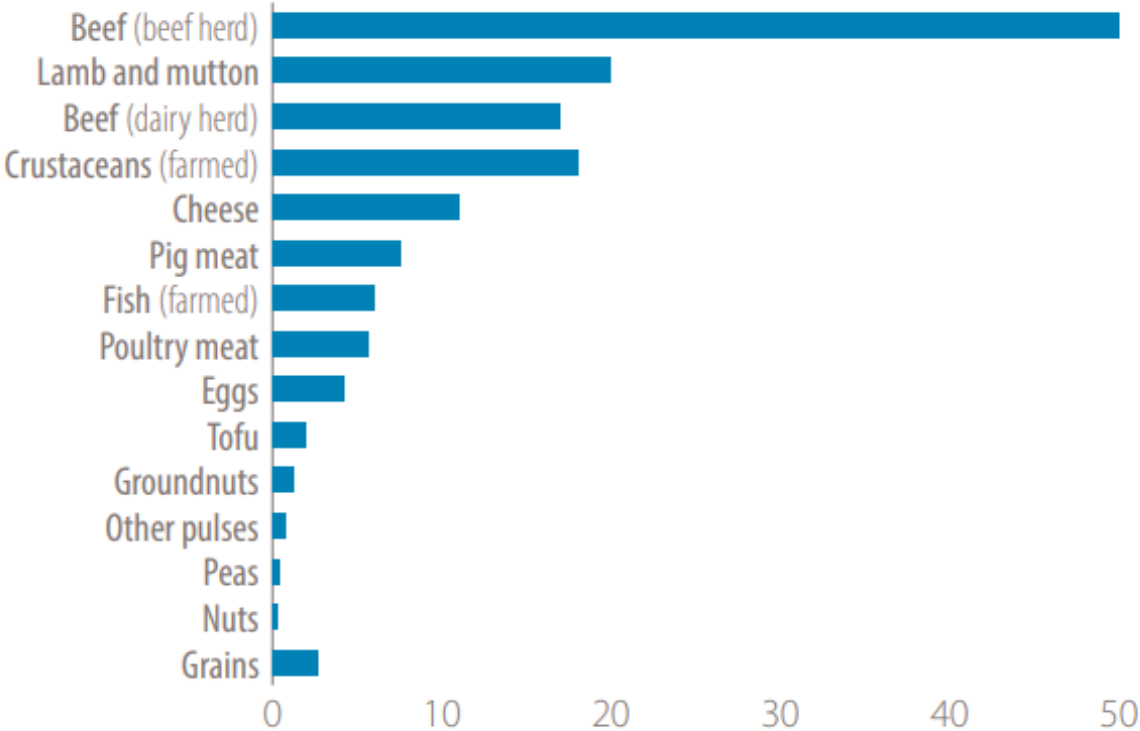


Impact of food on the environment: selected proteins



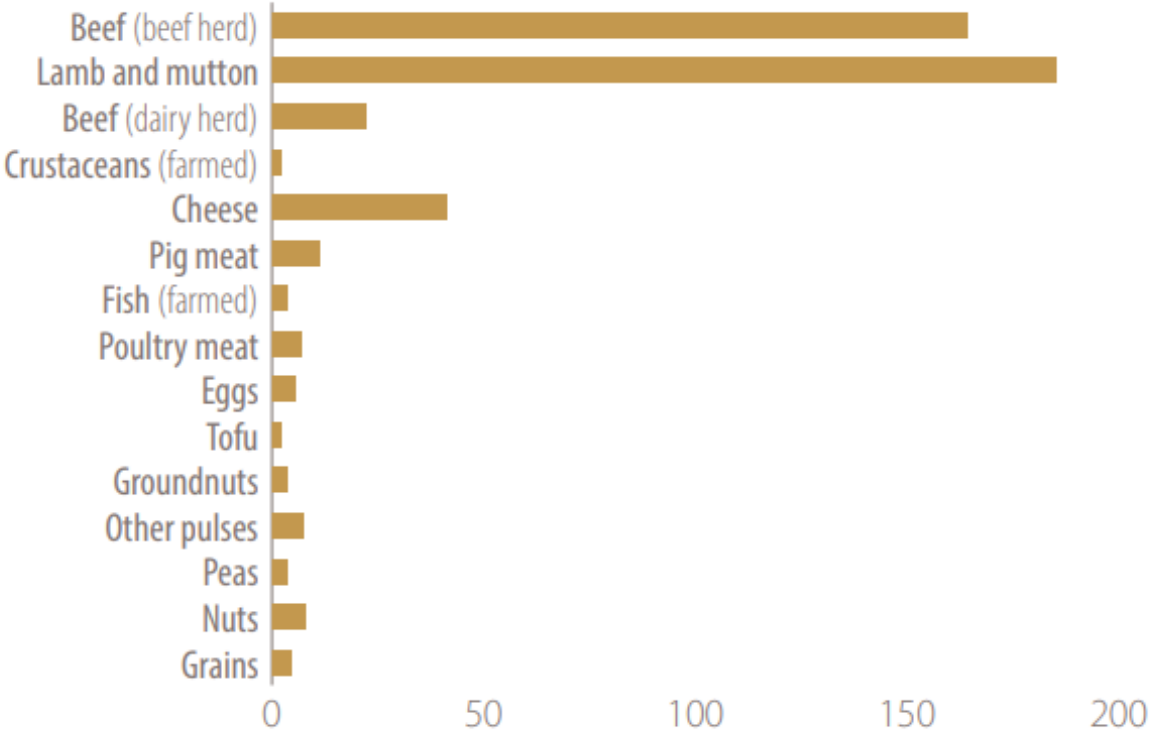
Average GHG emissions

(kg of CO₂ equivalent per 100 g of protein)



Average land use

(m² per year per 100 g of protein)



Note: Data are the mean values from approximately 38,700 commercially viable farms in 119 countries. Grains are shown here as they contribute 41 per cent of global protein intake, despite lower protein content.

Biodiversity

- **Hidden crisis** – We might observe the sixth mass extinction in Earth's history
- **Nature's contribution to people** – 70% poor people rely on natural resources
- **Species decline** – 60% decline in Living Planet Index between 1970 and 2014
- **Ecosystem decline** – 10 out of 14 terrestrial habitats showed a decrease in vegetation productivity 2000 – 2013
- **Marine biodiversity** – global fish stocks overexploitation increased from 10% in 1975 to 33% in 2015.
- **Genetic diversity** – crop genetic diversity being conserved for enhancing productivity, nutritional content and resilience.





Oceans and Coasts

- **Coral Reefs** – bleach every 6 years, recover every 10 years
- **Fisheries and aquaculture** – 58-120 MN people’s livelihoods, and over 3 billion people 20% of their protein
- **Marine plastics** – 8 million tons of plastic to oceans a year
- **Sustainable fisheries** – overexploitation

Impacts from human activities: Crosscutting

- **Human health** – Pollution costs more death than WWII/Year
- **Environmental disasters** – Affected more than 3 BN 2005-2015
- **Energy** – 1.2 BN no access to electricity and 2.7 BN use traditional fuels for cooking and heating
- **Chemicals** – More than 100,000 chemicals in use polluting the planet
- **Waste and wastewater** – urban waste approx. 7-10 BN tons/year





State of the Global Environment

1. latest science – 1.3 climate

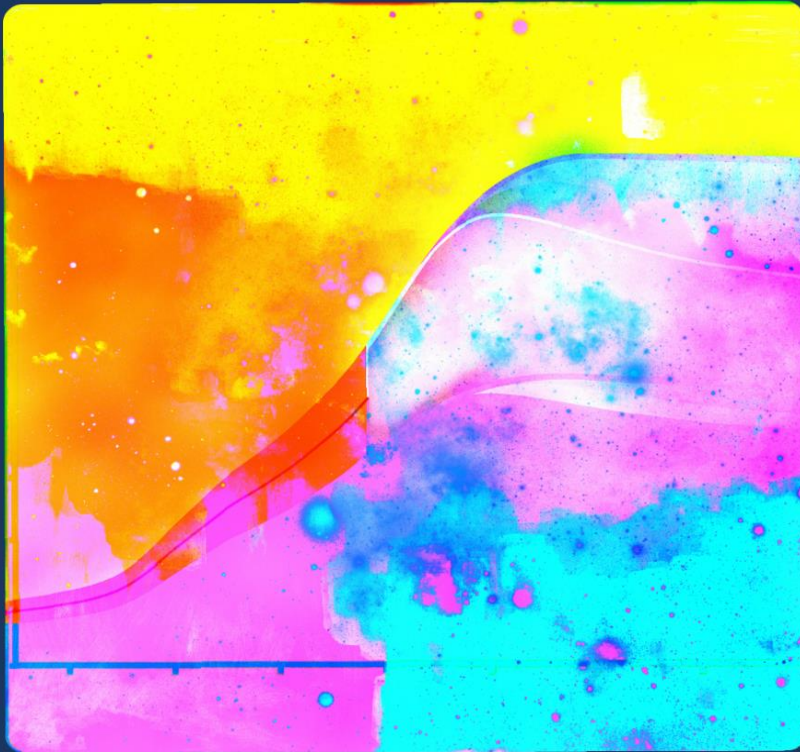


ipcc

INTERGOVERNMENTAL PANEL ON climate change

Global Warming of 1.5°C

An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty



WG I | WG II | WG III



• Every bit of warming matters •

• Every year matters •

• Every choice matters •

- Limiting warming to 1.5°C would require changes on an unprecedented scale

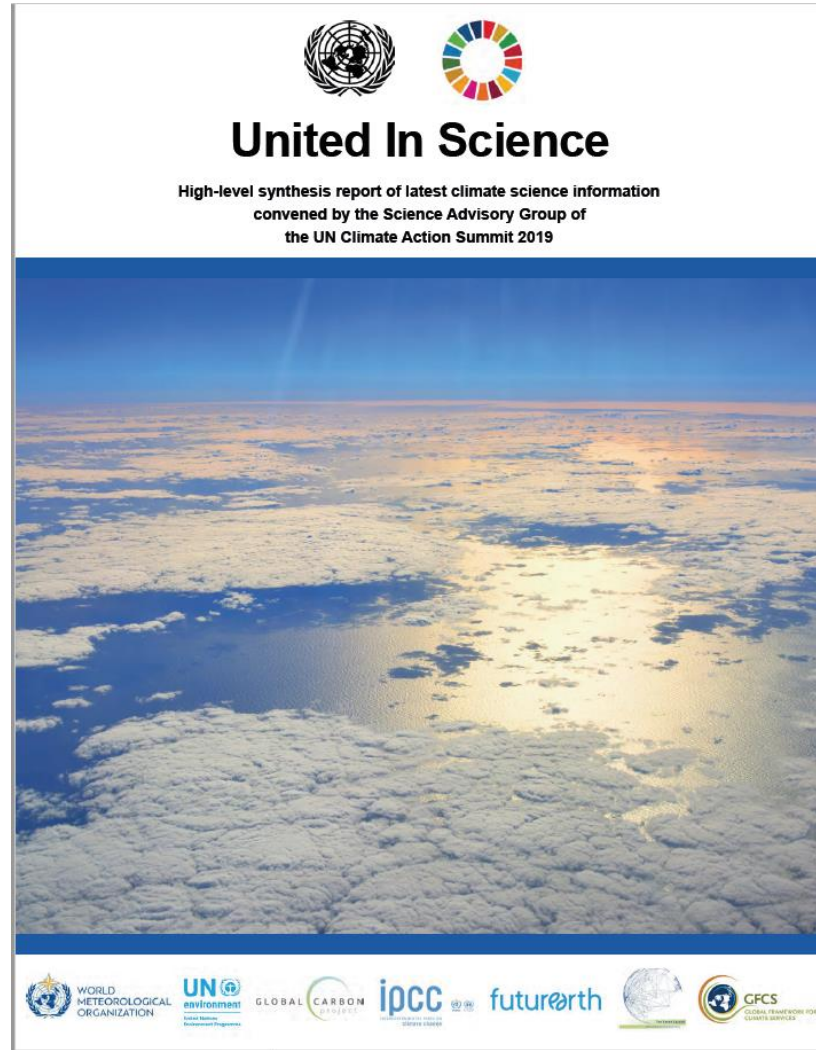
- Deep emissions cuts in all sectors
- A range of technologies
- Behavioural changes
- Increased investment in low carbon options



Pre-release chapter of EGR2019, **Bridging the Gap: Enhancing Mitigation Ambition and Action at G20 Level and Globally** - <http://www.unenvironment.org/emissionsgap>

Lessons from a decade of emissions gap assessments (the 10-year summary) - <https://www.unenvironment.org/resources/emissions-gap-report-10-year-summary>

United In Science (published by WMO in collaboration with many agencies including UNEP) - https://public.wmo.int/en/resources/united_in_science



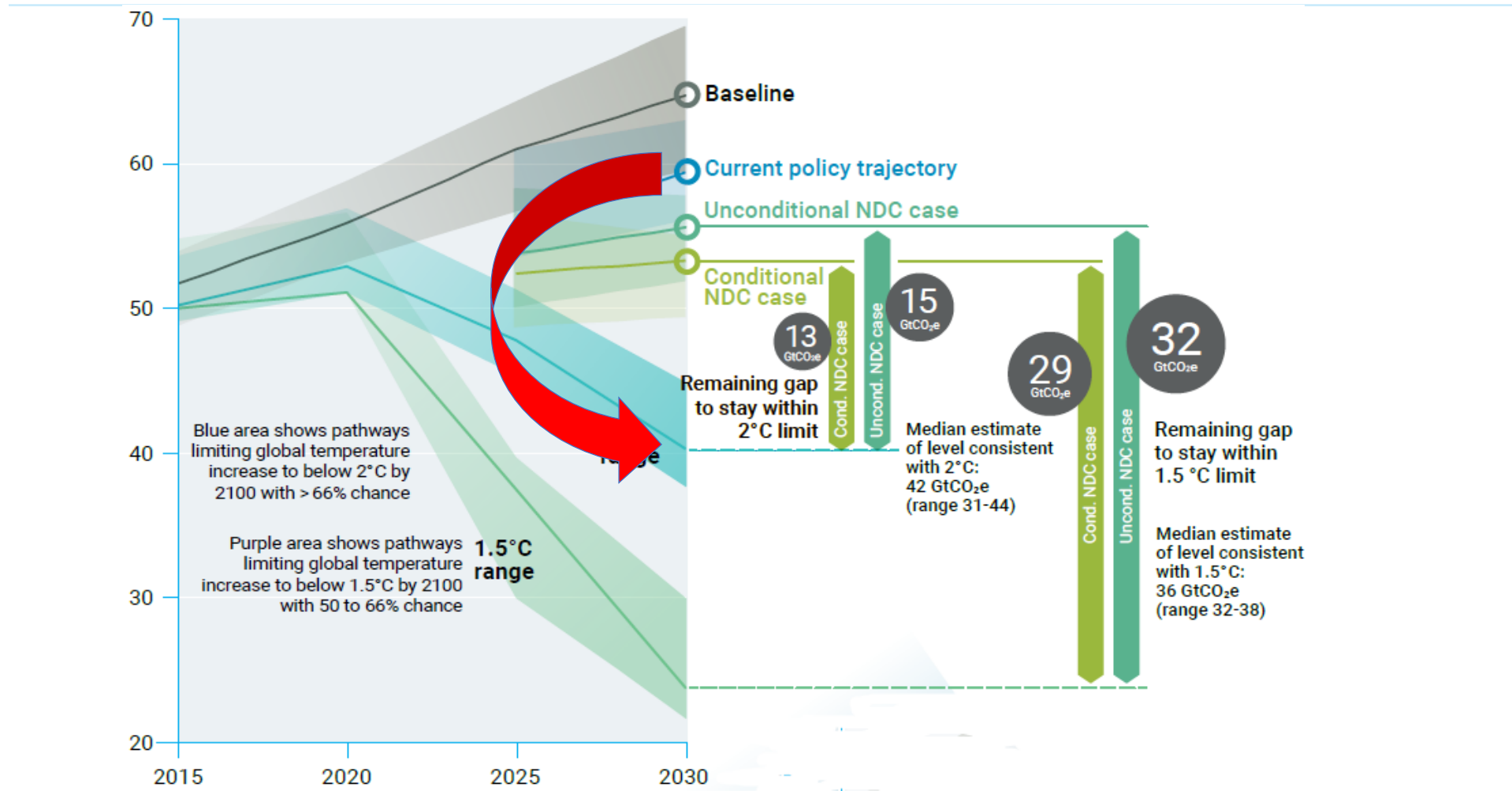
Emissions Gap Report 2018



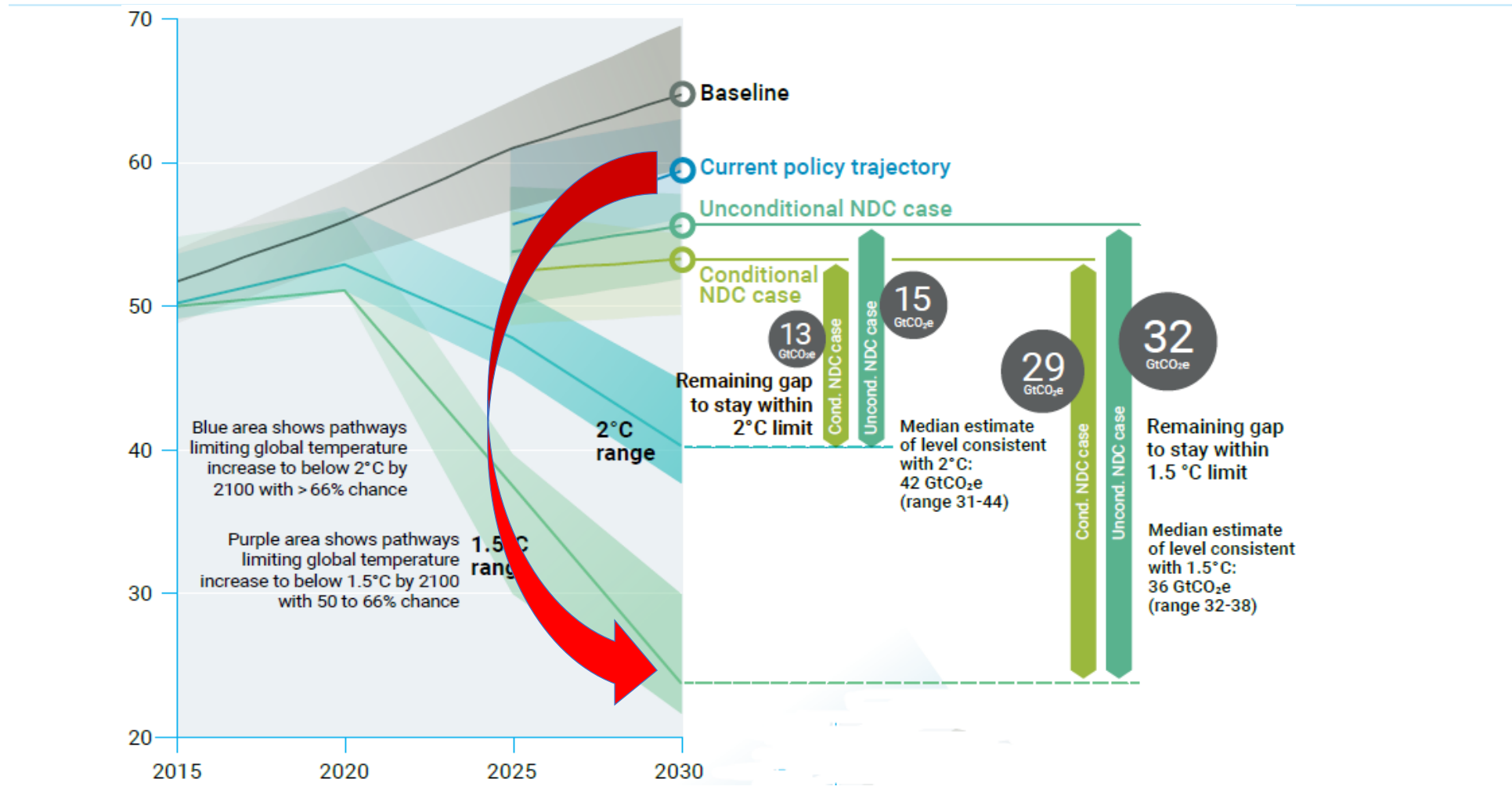
Trends in global emissions

- Global greenhouse gas emissions show no signs of peaking
- Global CO₂ emissions increased in 2017 to a record 53.5 GtCO₂e, following a three-year period of stabilization
- In contrast, global GHG emissions in 2030 need to be approximately 25% and **55%** lower than in 2017 to put the world on track for 2°C and 1.5°C global warming respectively

3x more ambition needed to fill the 2°C gap



and 5x more to fill the 1.5°C gap





State of the Global Environment

1. latest science – 1.4 resources



The **USE** of natural resources has more than **tripled** from 1970, and **continues to grow**

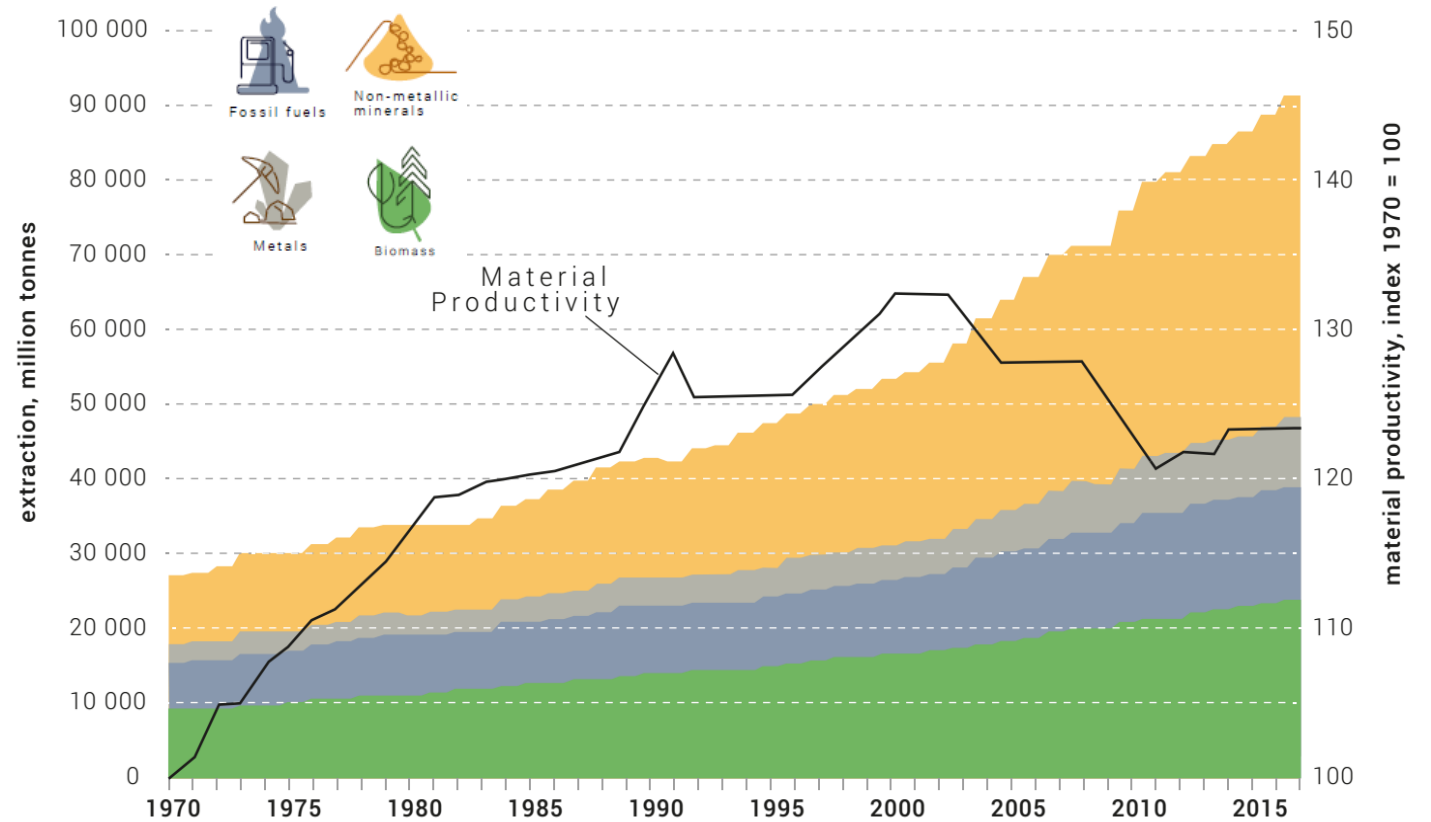


92 billion tons of global extraction



12.2 tons materials demand per capita

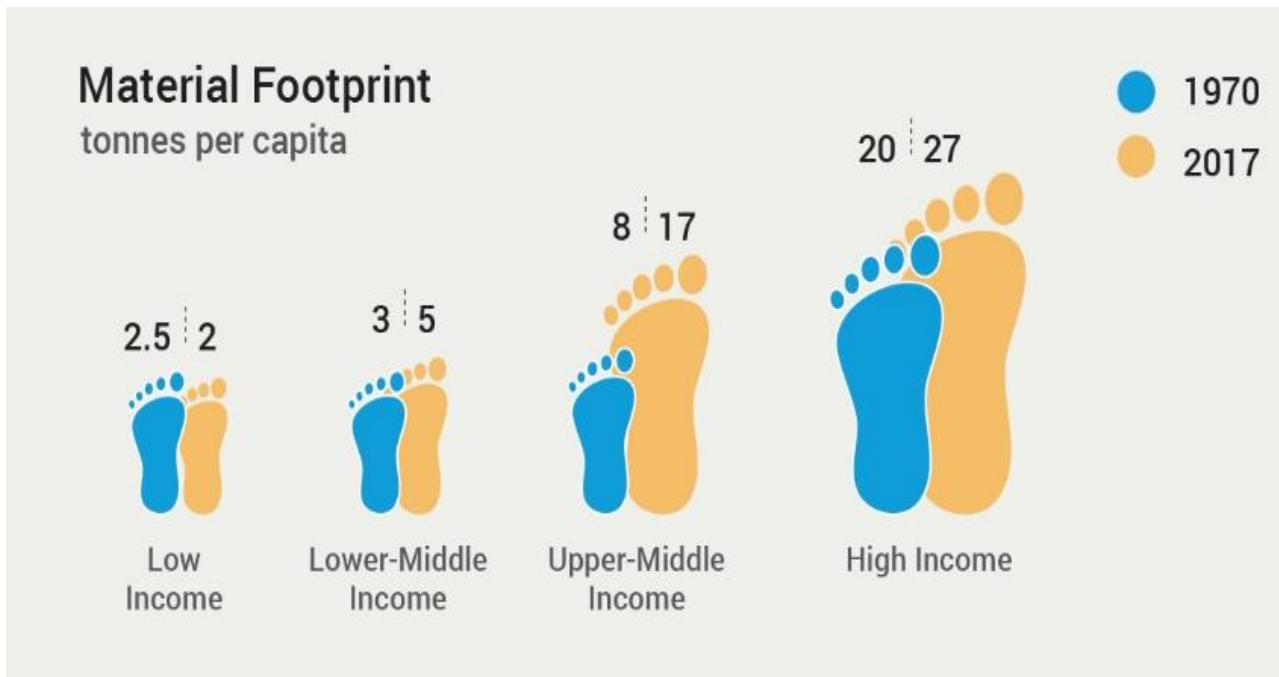
Global material extraction and material productivity, 1970 - 2017



Myth: Technological advancement is making the global economy more resource efficient.

Fact: Some (high-income) countries are becoming much more efficient but **global productivity has not improved** in the last 20 years

The **use** of natural resources and the related **benefits** and **environmental impacts** are **unevenly distributed** across **countries and regions**



Two Key Drivers of Middle-Income Resource Use Growth

New infrastructure
buildup in developing countries

Outsourcing of material & resource intensive production from high-income countries

High-income countries still dominate material footprints per capita



State of the Global Environment

1. latest science – 1.5 emerging issues



UN 
environment
assembly

The Fourth United Nations
Environment Assembly
of the United Nations
Environment Programme

Innovative Solutions for
Environmental Challenges
and Sustainable Consumption
and Production



FRONTIERS 2018/19
Emerging Issues of Environmental Concern



**Report on Key Emerging Issues of
Environmental Concern**





1. Synthetic Biology

- Advanced genetic engineering technology
- Release of modified organisms may change entire species populations
- Potential impacts demand regulatory methods
- Risk assessments must be applied
- Inclusion of stakeholder perspectives is needed



Photo credit: John Westrock

2. Ecological Connectivity

- Habitat fragmentation disrupts ecological functioning
- Small and isolated fragments reduce species survival chances
- Restoring connectivity between habitat patches is a must to preserve biodiversity
- Connectivity should be a key element in any post-2020 global biodiversity framework

THINK
BEYON
D
LIVE
WITHIN



Photo credit: Mans Joosten

3. Permafrost Peatlands

- Permafrost peatlands hold almost half of the world's soil organic carbon
- They are undergoing rapid change due to climate change causing thawing
- Action is needed to ensure they retain their carbon deposits
- Otherwise, we may fail to avoid an uncontrollable “Hothouse Earth”

THINK
BEYON
D
LIVE
WITHIN



Photo credit: gillmar/shutterstock.com

4. The Nitrogen Fix

- Nitrogen pollution affects the air, climate, oceans, biodiversity, health and food
- Caused mainly by inefficient use of nitrogen fertilizers in agriculture
- Circular economy provides a solution
- Value of nitrogen implies major economic opportunity for a nitrogen circular economy

THINK
BEYON
D
LIVE
WITHIN

5. Maladaptation to Climate Change

- Climate adaptation planning needs to consider consequences up-front
- Successful climate adaptation has to be affordable for all, including marginalized peoples
- Maladaptation leads to dead ends
- Today's choices will determine the amount of options available in the future

THINK
BEYOND
LIVE
WITHIN



State of the Global Environment

Policy implications



Figure 11.1: Conceptual outline of policy effectiveness analysis

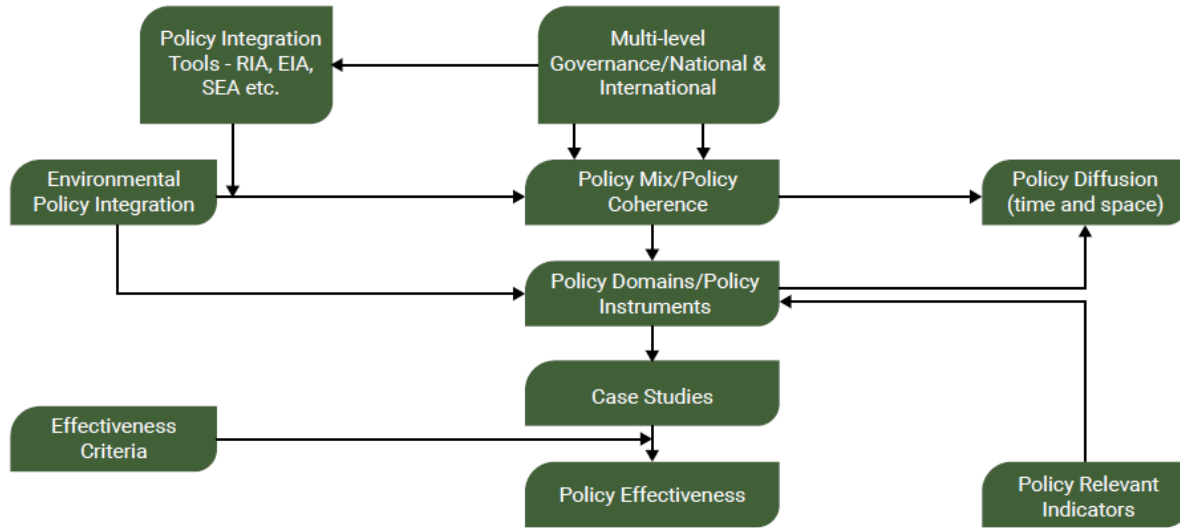
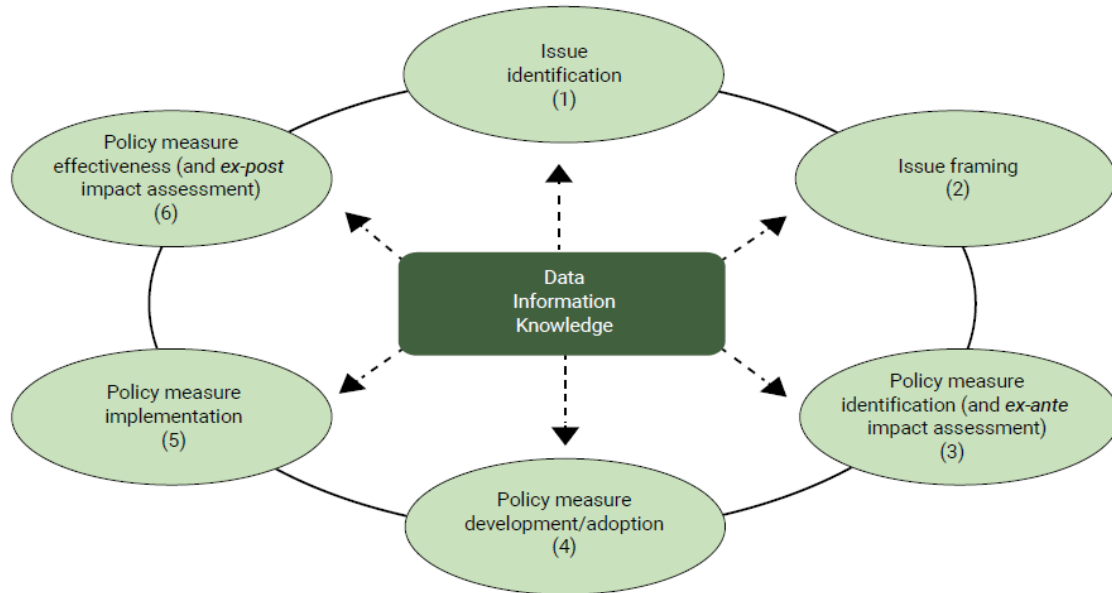


Figure 11.2: The policy cycle



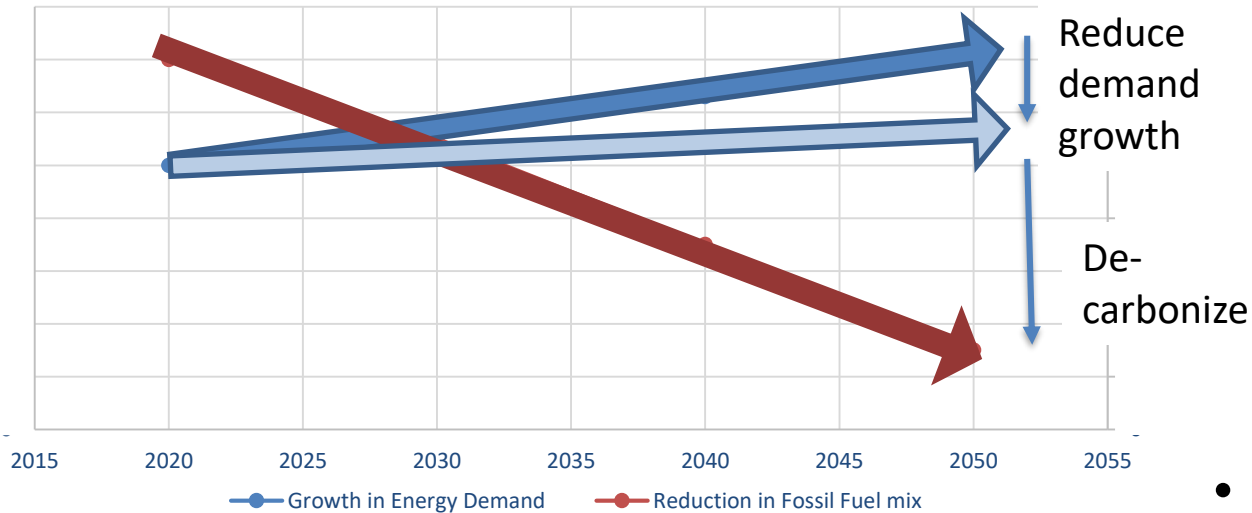
Source: European Environment Agency [EEA] (2006)

Effectiveness of environmental policies

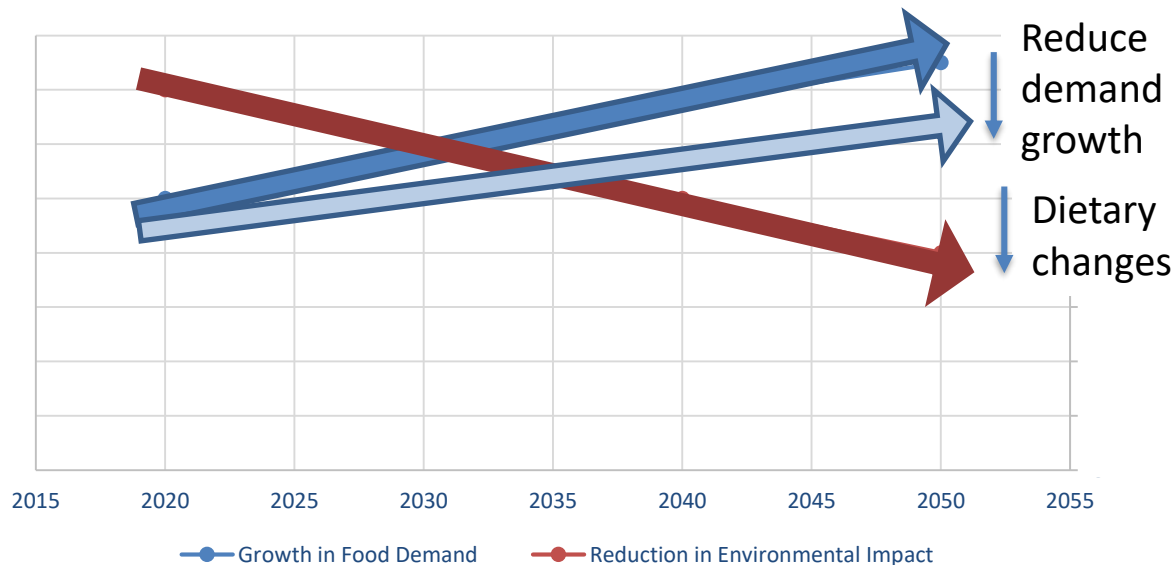
- **Policy design** – at least as important as policy choice when measuring effectiveness.
- **Effectiveness** – Not enough information is available to assess effectiveness, so policies may not reach their full potential.
- **Diffusion** –successful policies are used as role models for adoption in other countries.
- **Integration** – adding environmental concerns to other sectors of policymaking increases effectiveness.
- **Efforts are insufficient** – existing policies insufficient to address the backlog of environmental problems.
- **Systemic approaches** – transformative change by reconfiguring basic social and production systems and structures is needed.

Changing the path we are on

Opposing Trends for Energy Demand and Fossil Fuel Mix



Opposing Trends for Food Demand and Environmental Impact



- **Pathways exist to meet the environmental dimension of SDGs/MEAs** – transitions in consumption, production, access and environmental management. **Transforming food and energy systems is central** to the pathways that could achieve environmental sustainability.
- **Incremental policies will not be sufficient** – all pathways require rapid and wide-ranging innovations; many beyond historic rates of change. **Policy integration and coherence are needed** – integrate environmental concerns in all policy sectors at all levels to deal with possible trade-offs.
- **More synergies than tradeoffs exist** – e.g. phasing out fossil fuels will help achieve air pollution, climate and human health goals.

Participatory approaches

- **Ideas and small scale projects already exist** – Through workshops and crowd-sourcing, innovation can be found.
- **Participation in development of policy approaches improves their effectiveness** – Engagement is strengthened and local issues are addressed.
- **Bottom-up initiatives can help refine our understanding of the future** – Current models consider broad megatrends. These can be refined with bottom-up information.
- **Both social and technical innovations are needed** – participatory approaches can understand how to implement these systemic approaches.

Figure 23.9: Heat map of Climate CoLab proposals showing pairings of measures/interventions and SDGs

Cluster	Measure category	No poverty (1)	Zero hunger (2)	Good health and well-being (3)	Quality education (4)	Gender equality (5)	Clean water and sanitation (6)	Affordable and clean energy (7)	Decent work and economic growth (8)	Industry, innovation and infrastructure (9)	Reduced inequalities (10)	Sustainable cities and communities (11)	Responsible consumption and production (12)	Climate action (13)	Life below water (14)	Life on land (15)	Peace, justice and strong institutions (16)	Partnership for the goals (17)
Energy, Climate and Air	Energy access	2	2	2	1	1	2	4	2	2	1	0	1	4	1	1	0	2
	Behavioural change (transport and households)	3	3	3	1	2	2	4	3	3	2	3	3	5	3	3	2	4
	End-use electrification	1	1	1	0	0	2	2	1	1	0	1	0	1	1	1	0	0
	Low/zero emission technologies (non-biomass)	3	4	4	1	2	3	5	4	2	2	2	0	5	1	2	1	3
	Bioenergy (with and without CCS)	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0
	Improve energy efficiency	2	2	2	1	1	2	1	2	1	1	2	0	3	1	1	0	1
	Negative emission technologies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Air pollution control Non-CO ₂ emission reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agriculture, Food, Land and Biodiversity	Reduce food waste	2	2	2	1	2	1	1	1	1	1	2	1	2	1	1	1	2
	Yield improvement	3	3	2	0	2	1	0	1	1	1	1	1	3	0	1	0	2
	Nutrition management	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Food access	7	10	10	4	6	4	6	8	3	5	4	6	10	3	6	2	8
	Diet change	0	1	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0
	Manage soil carbon loss	3	3	2	1	2	3	1	1	1	1	2	1	3	1	1	1	2
	Minimize land damage	5	8	8	3	6	7	6	7	5	5	4	6	10	4	7	3	6
	Land ownership	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Protection of terrestrial ecosystems	3	5	5	2	3	5	4	4	3	2	3	5	6	3	5	1	3
	Land-use planning	1	2	2	1	0	1	0	0	1	0	0	1	2	0	1	0	1
Forest management	2	3	2	1	1	4	3	2	1	0	1	3	4	2	3	0	1	
Human Well-being	Poverty alleviation	8	9	9	3	5	5	7	4	4	3	5	10	3	5	1	5	
	Child/ maternal healthcare	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Education	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Freshwater and Oceans	Improve water-use efficiency	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
	Blue carbon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WASH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Wastewater treatment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Water quality standards	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Desalination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Integrated water resource management	1	3	3	2	3	2	2	3	0	2	2	0	3	0	1	1	3
	Sustainable fisheries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ocean regulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Protection of marine ecosystems	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other	Monitoring and reporting	1	1	2	1	0	2	1	1	2	1	1	1	2	0	1	2	2
	Circular economy	3	3	5	1	3	1	1	1	2	2	4	4	4	1	2	1	2
	Sharing economy	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	2
	Plastics and consumer waste reduction	2	1	3	0	2	1	0	0	1	1	4	4	4	1	3	0	2
	Awareness and skills building	7	8	8	5	7	7	7	8	5	7	0	7	13	5	7	5	6
	Gender equality	5	6	7	2	7	3	3	3	3	3	3	3	3	3	3	3	3
	Smart cities for sustainability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ecosystem restoration	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Effective governance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



Numbers indicate the count of proposals coded with the specific pairing of intervention (row) and SDG (column). 'Other' is described more in Section 23.11

TRADITIONAL KNOWLEDGE

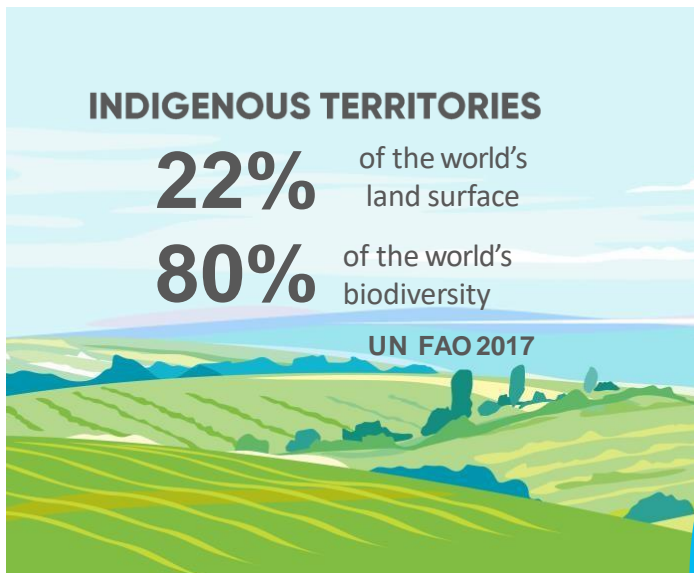
INDIGENOUS PEOPLES IN THE AGENDA 2030

INDIGENOUS TERRITORIES

22% of the world's land surface

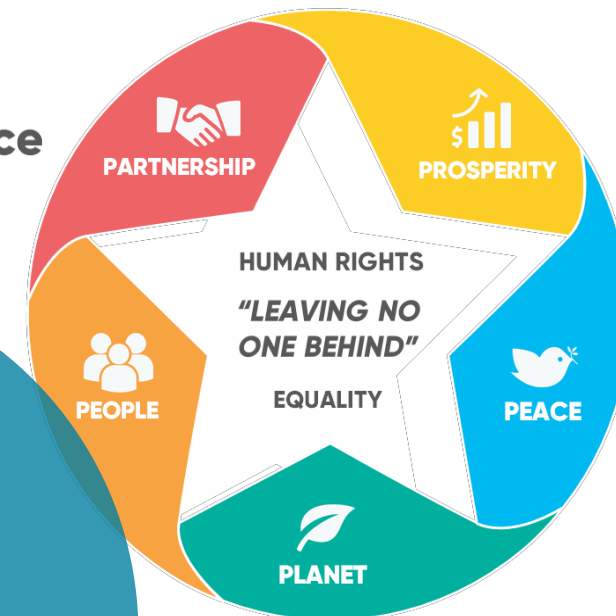
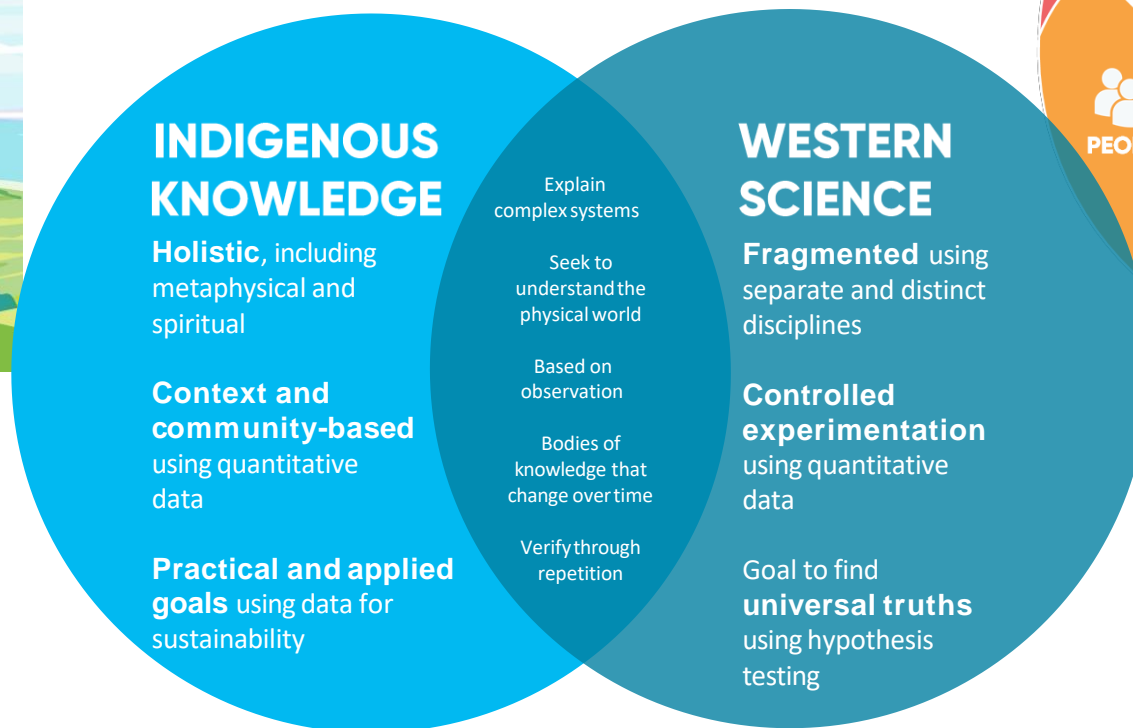
80% of the world's biodiversity

UN FAO 2017



Lands and territories of indigenous peoples are the base of their knowledge.

Traditional knowledge and Western Science



CITIZEN SCIENCE

ENGAGEMENT OF VOLUNTEERS IN SCIENCE AND RESEARCH

CITIZEN SCIENCE INITIATIVES

- Collaborative knowledge (e.g. Wikipedia, OpenStreetMap)
- Volunteer computing (e.g. Citizen Grid, climateprediction.net)
- Pattern classification (e.g. Galaxy Zoo, eyewire)
- Community collection of observations (e.g. bird counting, air sensor toolbox)



BENEFITS

- Collection of data at lower cost.
- Increased scientific literacy
- Citizen engagement
- Cost-effective measure
- Improved environmental monitoring
- Exposure to scientific expertise and indigenous knowledge

TARGETED RESPONSE

- Technology revolution has introduced multiple ways of **collecting, archiving, analyzing, transmitting, and processing huge volumes of data.**
- Citizen science can be used to **sensitize and engage the community** on issues related to their natural environment

FIELD DATA AND REPORT GENERATION

- Top-down - Scientists train volunteers
- Bottom-up – Community-driven research

BENEFICIARIES OF CITIZEN SCIENCE

Features **user-configurable cause-effect** (DPSIR) indicator dashboards.

- Individual Citizen
- Governments
- Communities
- Scientists and Researchers





State of the Global Environment

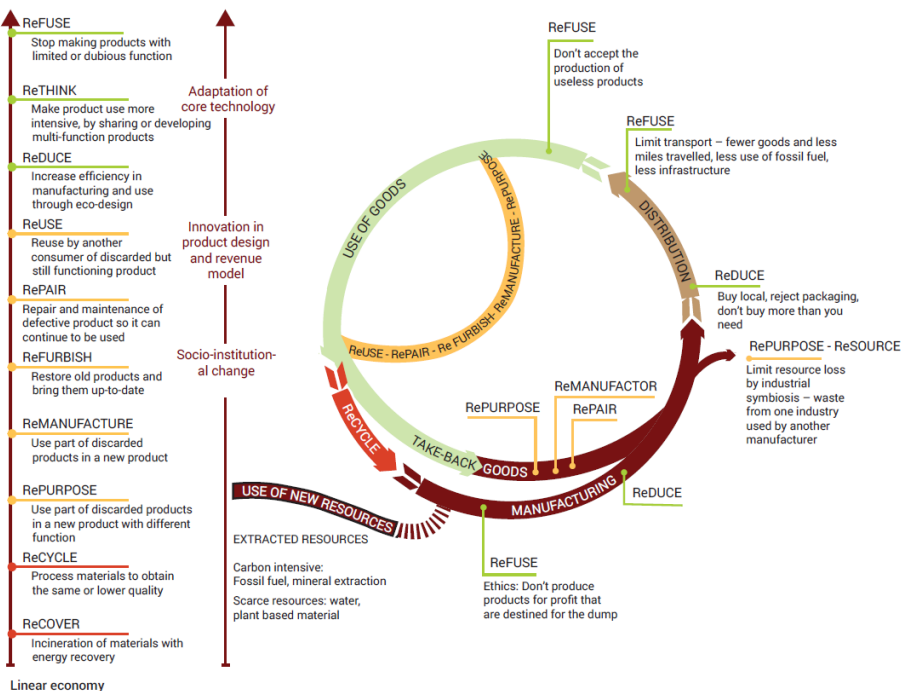
3. The way forward



Figure 17.4: Building a circular economy

Ultimate circularity Circular economy goes beyond recycling

Circular economy

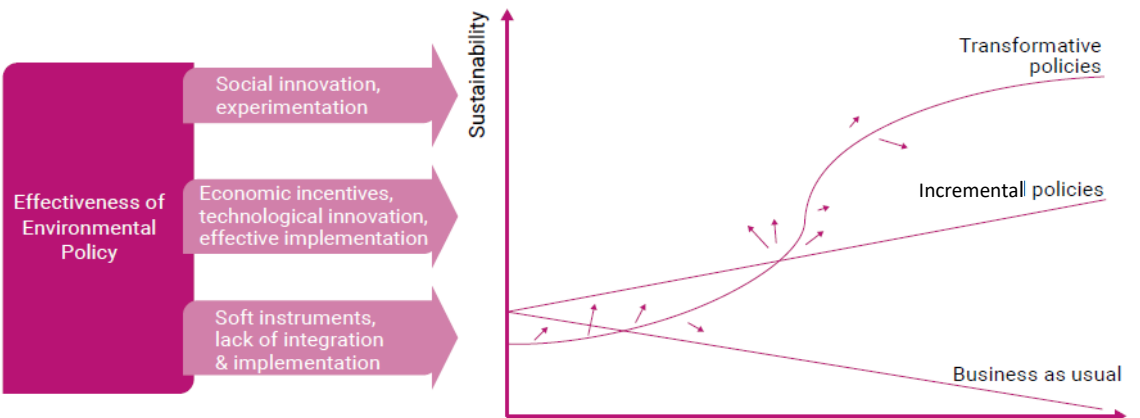


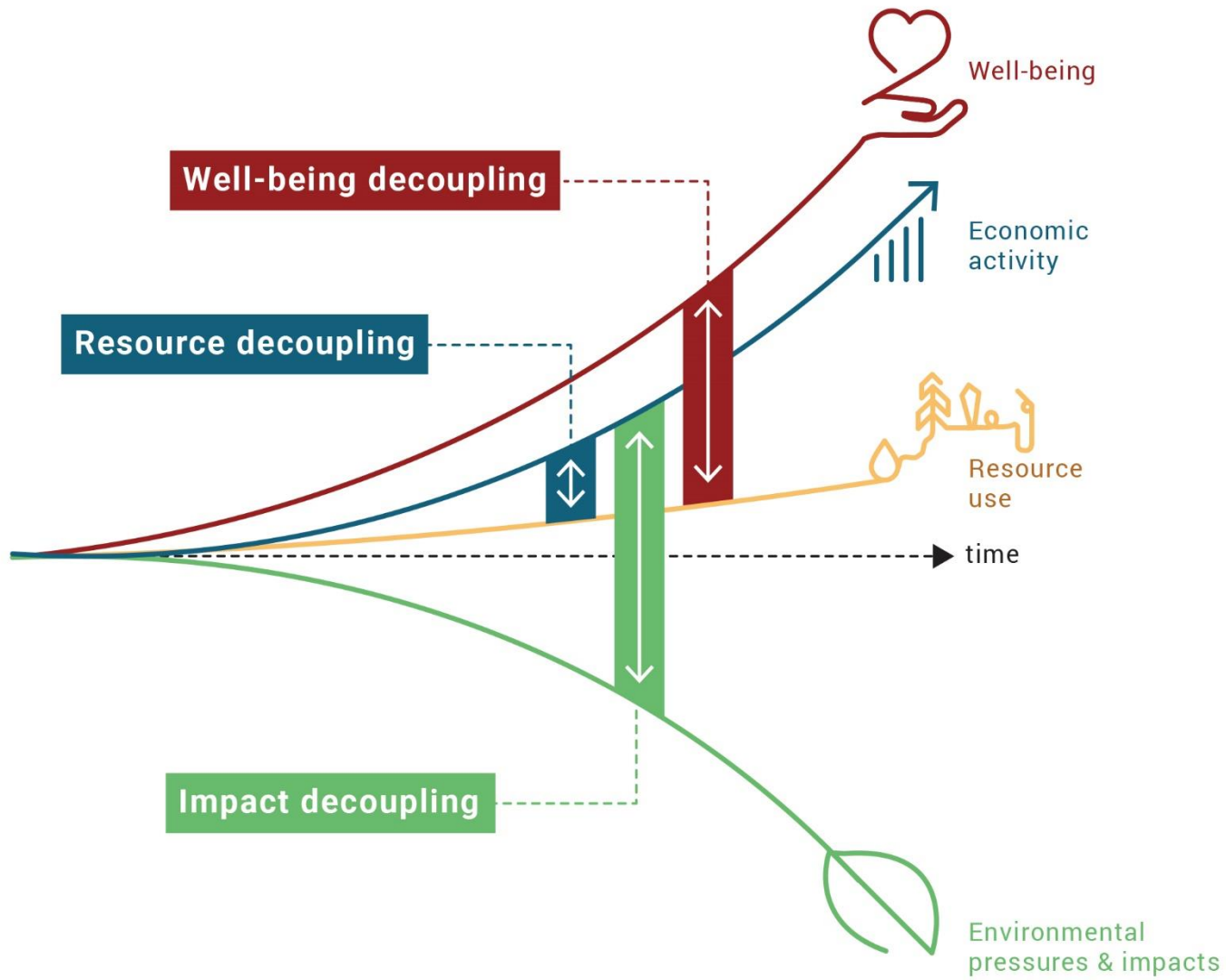
Source: Based on Stahel (2016) and Potting et al. (2017).

The way forward

- **Healthy planet is a foundation for supporting all life forms** – but, we have transformed earth’s natural systems and disrupted self-regulatory mechanisms and life-support systems.
- **Human health is now affected at a significant scale** – through exposure to harmful pollutants and reduced access to ecosystem services.
- **Policy innovation** – can help guide the transformative change that is needed.
- **Systemic innovation** – the key to socioeconomic development towards a sustainable world.
- **Transformative change** – is a disruptive process that goes beyond incremental improvement, but can be achieved.

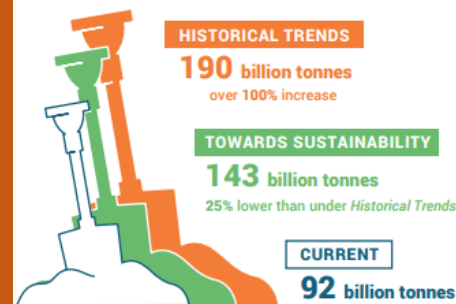
Figure 24.1: Different policy approaches



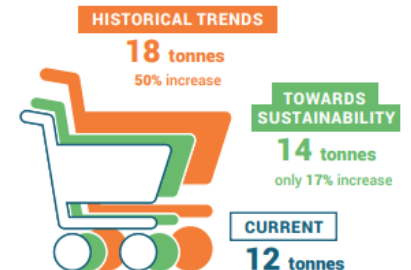


The decoupling of natural resource use and environmental impacts from economic activity and human well-being is an **essential** element in the transition to a **sustainable future**

Global material extraction



Domestic material consumption per capita



The projections are based on the understanding that growth rates in emerging and other developing economies must be balanced by absolute reductions in resource use in developed countries.

Strengthening NDCs

Countries can bridge the emissions gap:

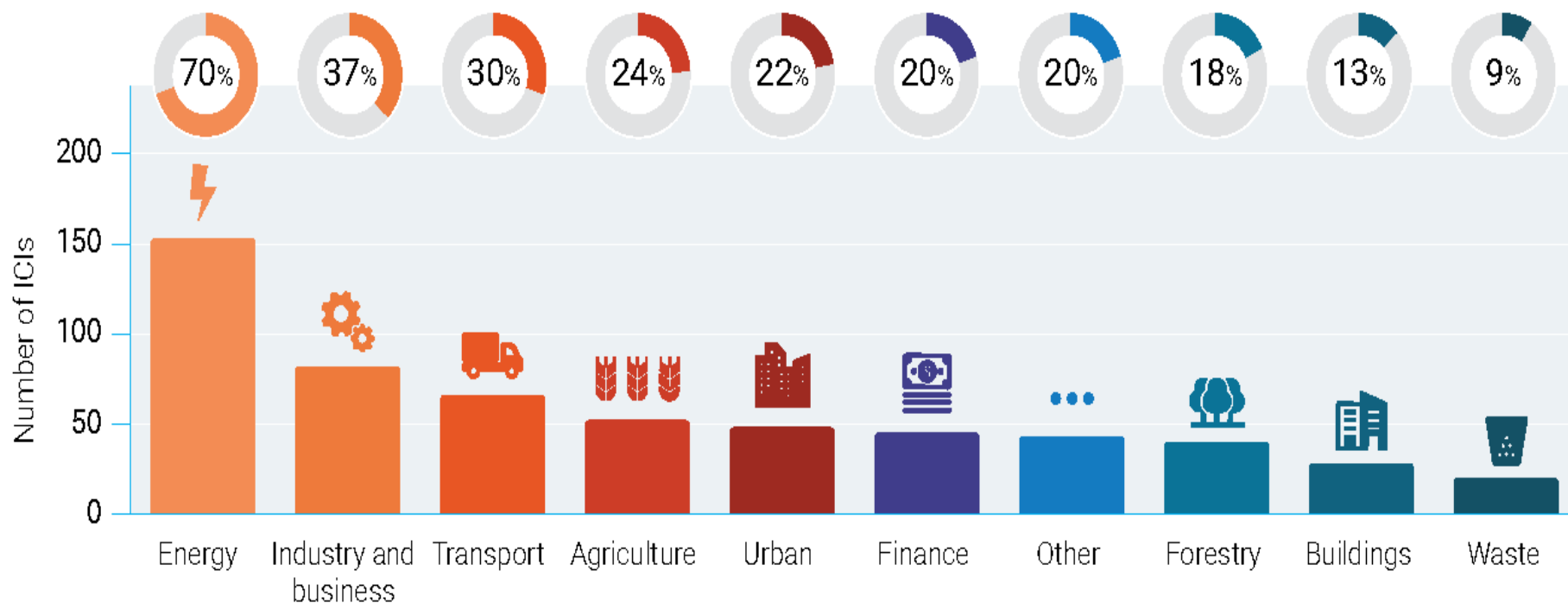
- NDCs can be strengthened in many ways
- Technical potential is available to close the gap entirely
- Coverage and effectiveness of national policies can be increased, roll out of good practices would narrow the gap considerably
- Most climate actions have significant sustainable development benefits



Untapped potential: non-energy sectors & NSAs

Sectoral coverage of ICIs

% of ICIs that include the given sector



Box 1 Defining international cooperative initiatives

Although there is no single definition of an international cooperative initiative (ICI), a number of terms and common characteristics help characterize them. When non-state or subnational actors from at least two different countries “adhere to rules and practices that seek to steer behaviour towards shared, public goals” across borders (Andonova *et al.*, 2017), they engage in “transnational climate governance” (Andonova *et al.*, 2009). Broader coalitions made up of countries, companies, non-governmental organizations (NGOs), academia, international organizations or subnational public actors, such as cities and regions, form cooperative initiatives (Blok *et al.*, 2012). When these coalitions cross national borders they become “international cooperative initiatives” (Widerberg and Pattberg, 2015).

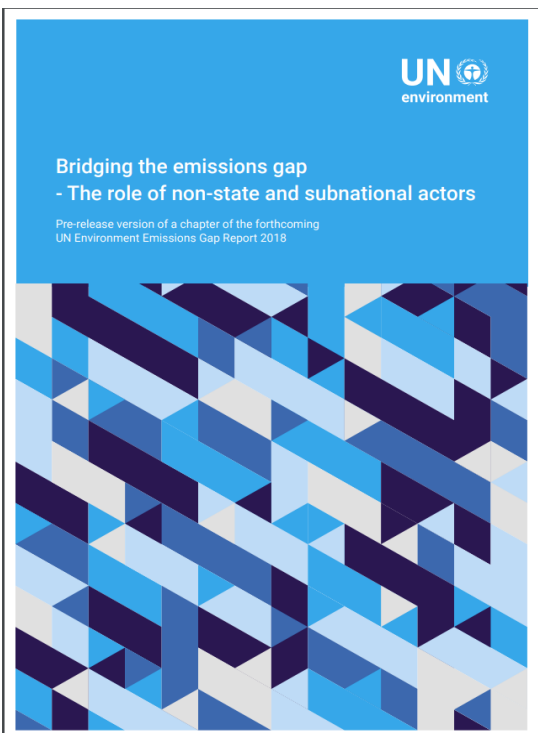


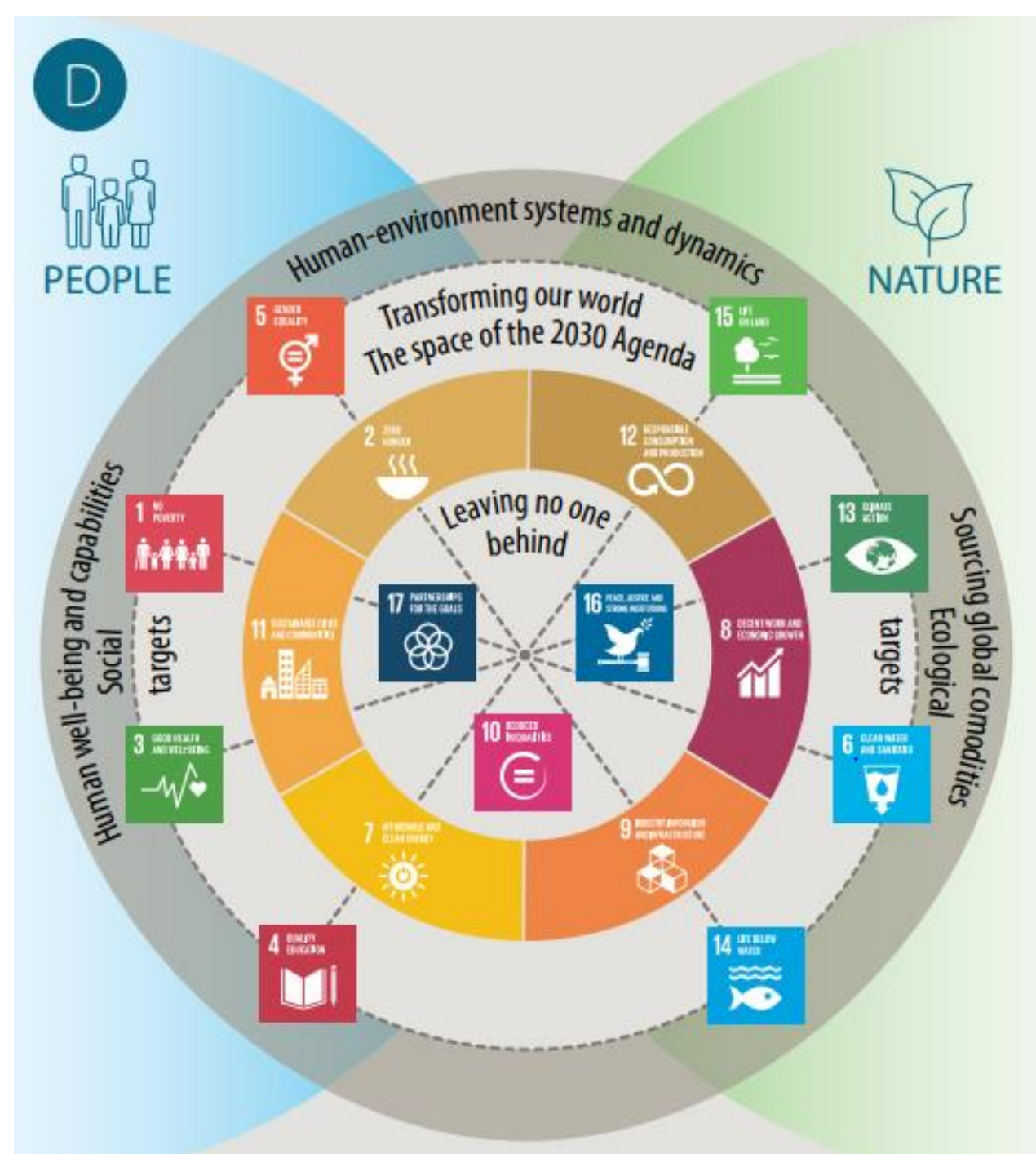
Figure VIII
Multi-beneficial Policymaking



Source: Adapted from International Resource Panel, 2017, Assessing global resource use: A systems approach to resource efficiency and pollution reduction

“There is reason for hope: human well-being need not depend on intensive resource use”

“..it is possible to advance human development within the sustainability limits of impacting nature. In order to accelerate progress in that way, a more integrated approach that addresses multiple goals simultaneously is needed, rather than narrow, sectoral approaches that focus on one or an excessively narrow subset of goals at a time”



world environment situation [site under construction]

<https://environmentlive.unep.org/situation>



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Data and Statistics Assessments World Data Sustainable Development Goals Get Involved Log In Teua Lughu

Environment Situation Room

Full screen

Pollution

Select theme-

WESR: Pollution - English - Filter views ...

Sort by Title - Date - Filter activated views

- Artisanal and Small-scale Mining (ASM Population)
- Bing aerial imagery
- Changes in Ocean Acidification - KNB
- Commercial Activity (Shipping Lanes) 2008 - KNB
- Commercial Activity (shipping Lanes) 2013 - KNB
- Consumption of Ozone-Depleting Substances - CFCs (1990-2016)
- Cumulative Ocean Impact - Sum of Pressure Data 2013 - KNB
- Eliminating PCBs
- Global Carbon Emissions weighted by population (2014)

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Thank you

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Science Division