Central Asia Regional Trialogue on Land Degradation, Biodiversity and Climate Change

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BESNet
Biodiversity and Ecosystem Services Network

The Linkages between Ecosystem Health, Land Degradation and Climate Change

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Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

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Part I

About IPBES

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

- IPBES's mission:

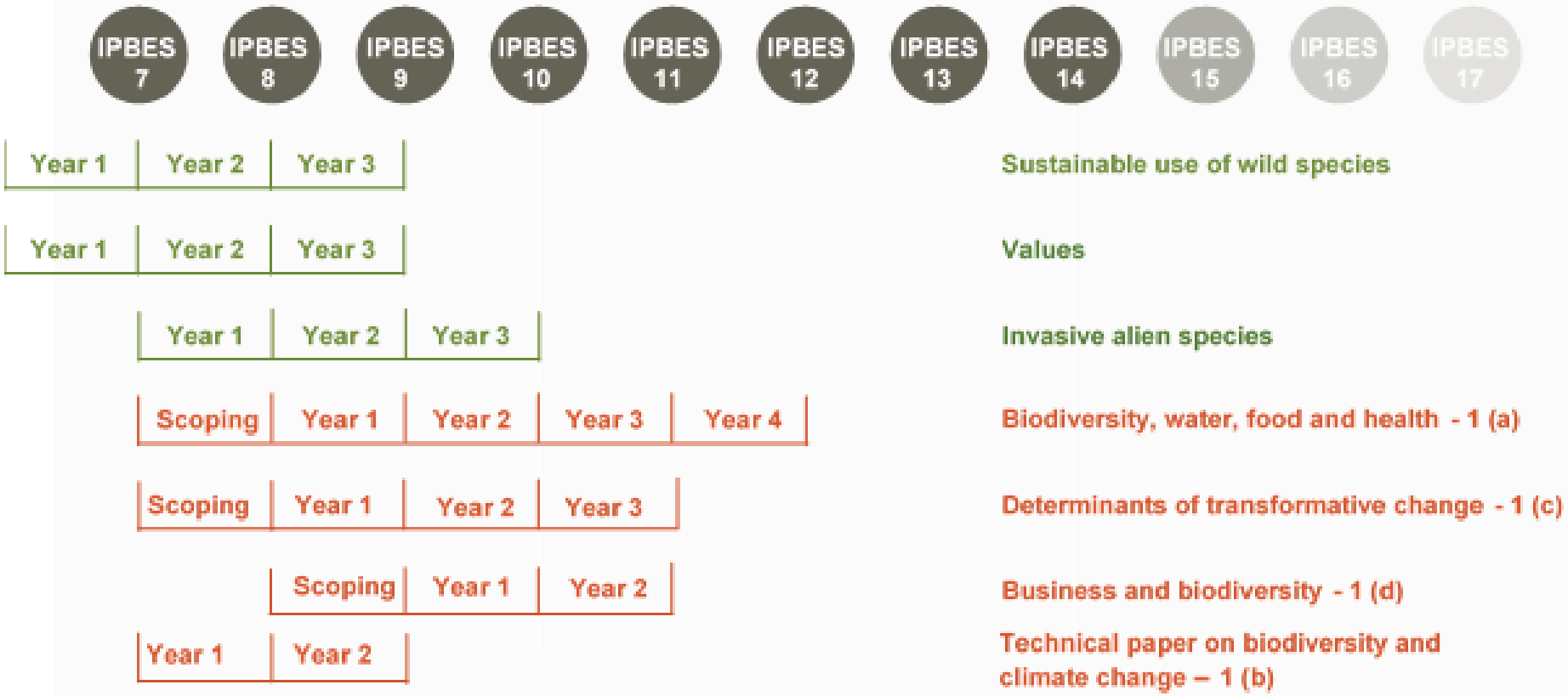
To strengthen knowledge foundations for better policy through science, for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.

- An independent intergovernmental body, established in 2012 by Governments, with currently **133** Members
- IPBES has completed its first work programme (2014-2018) and the last of the straddling elements are the 3 on-going assessments
- IPBES has approved its next work programme (2018-2030)
- Collaborative partnership arrangement with UNEP, UNESCO, FAO and UNDP
- Secretariat hosted by Germany, in Bonn

What does IPBES do? The next work programme of IPBES (to 2030) is grouped around 6 complementary objectives

- 1. Assessing knowledge (synthesis & critical evaluation of available knowledge)
  - On specific themes: “Pollinators, pollination and food Production” (2016); “Land degradation and restoration” (2018); “Sustainable use of wild species” (2021); “Invasive alien species” (2022)
  - On methodological issues: “Scenarios and models” (2016); “Values” (2021);
  - At both the regional and global levels: 4 Regional assessments of Biodiversity and Ecosystem Services (2018); “Global assessment of biodiversity and ecosystem services (2019)
- 2. Policy support
  - Identifying policy-relevant tools and methodologies
  - Facilitating their use & catalysing their future development
- 3. Building capacity
  - Identifying & meeting priority capacity needs of IPBES Members, experts & stakeholders.
- 4. Catalysing the generation of new knowledge
  - Identifying and communicating gaps in knowledge to help fill gaps
- 5. Communicating and engaging
- 6. Improving the effectiveness of the Platform

IPBES assessments

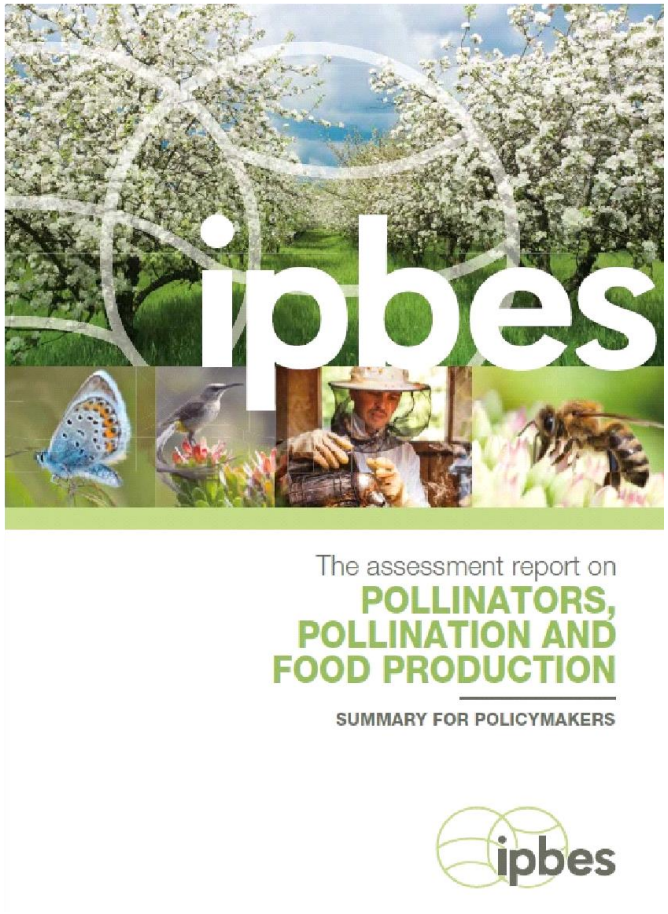


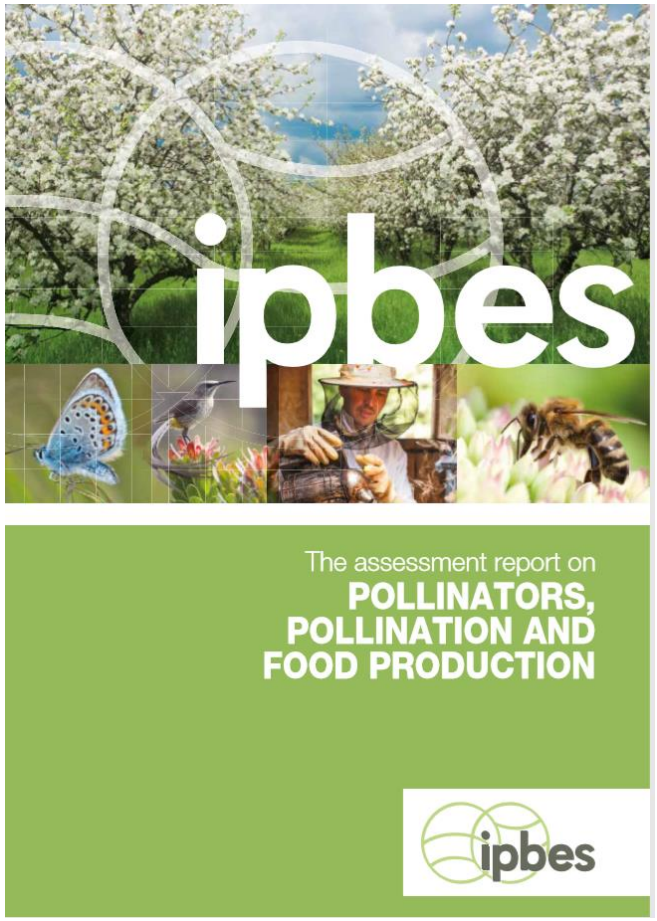
Part II

About IPBES assessments and their early impact

Assessment of an evidence base = scientific literature, grey literature and Indigenous and local knowledge

550 pages





DRIVERS OF POLLINATOR & POLLINATION CHANGE

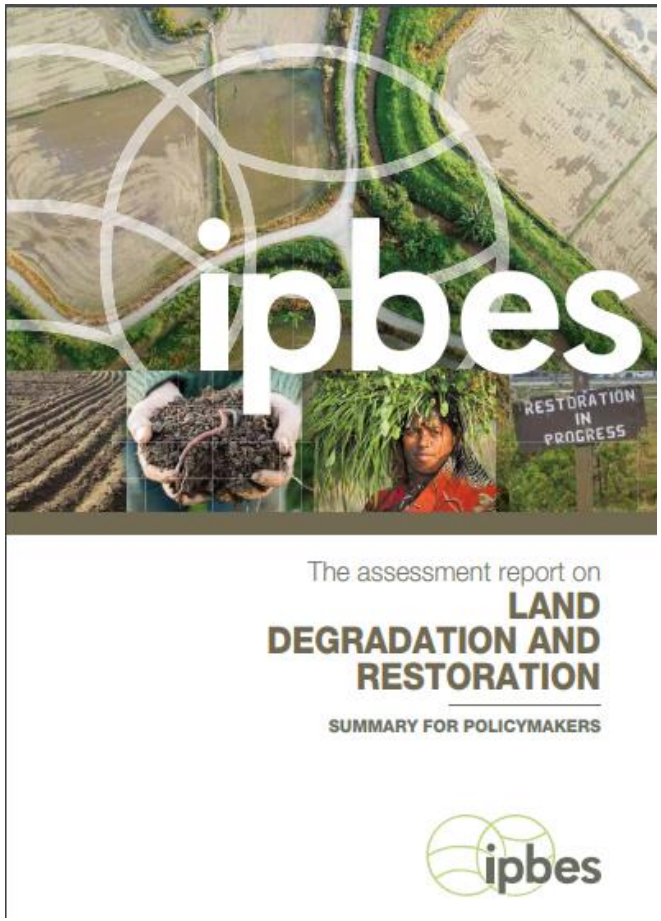
- The abundance, diversity and health of pollinators and the provision of pollination are threatened by direct drivers that generate risks to societies and ecosystems.

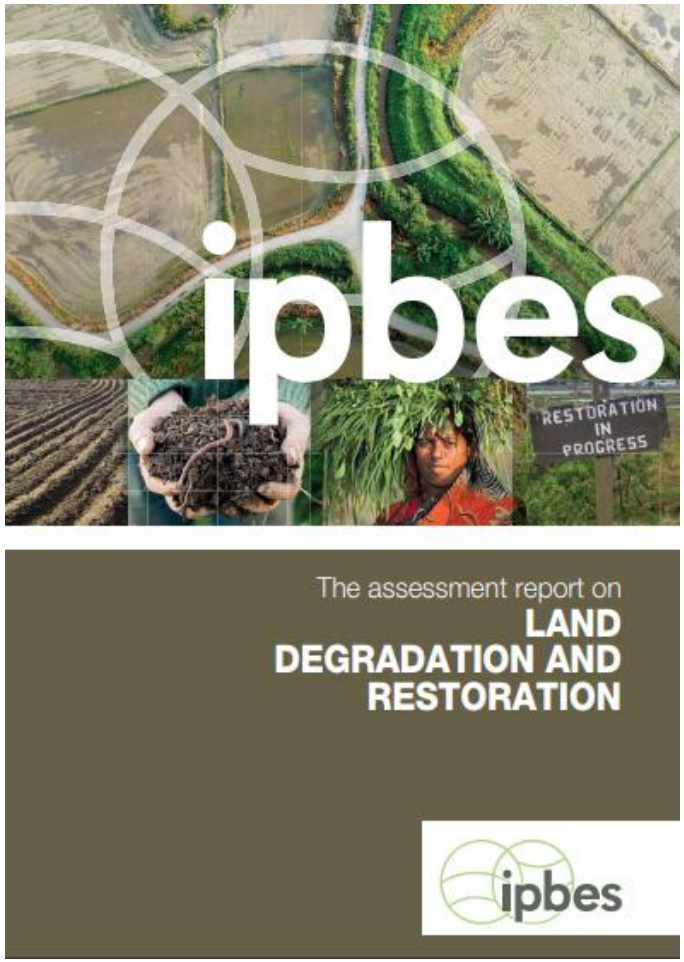
- Threats include:
- land-use change
- intensive agricultural management and pesticide use
- environmental pollution
- invasive alien species
- Pathogens
- Climate change

LAND-USE CHANGE

- Habitat destruction
- fragmentation and degradation
- conventional intensive land management practices:
- high use of agrochemicals
- intensively performed tillage, grazing or mowing
- By 2030, the area of agricultural land is expected to increase a further 10%, mainly in the developing world

Land Degradation and Restoration





- Approved in 2018 at the 6th session of the IPBES Plenary in Medellín, Colombia
- 3 year process
- Approx 4,000 scientific, Government, indigenous & local knowledge sources
- 98 selected authors + 7 early career fellows from 45 countries, assisted by 79 contributing authors

Degradation of the Earth's land surface through human activities is negatively impacting the well-being of at least 3.2 billion people & the pressures on global land resources are greater than at any other time in human history

Tyler Hicks/The New York Times

Serious Danger to Human Well-being

LAND DEGRADATION is defined as the many human-caused processes that drive the decline or loss in biodiversity, ecosystem functions or ecosystem services in any terrestrial and associated aquatic ecosystems

- Land degradation can manifest in many ways: land abandonment, declining populations of wild species, loss of soil and soil health, rangelands and fresh water, as well as deforestation.
- **Rapid expansion and unsustainable management of croplands and grazing lands** is **the most extensive global direct driver of land degradation**, causing significant loss of biodiversity and ecosystem services – food security, water purification, the provision of energy and other contributions of nature essential to people. This has reached 'critical' levels in many parts of the world, the report says.
- Wetlands - losses of 87% in wetland areas since the start of the modern era – with 54% lost since 1900
- Biodiversity loss is projected to reach 38–46% by 2050. The strongest drivers of biodiversity loss to date have been **agriculture followed by forestry, infrastructure, urban encroachment and climate change.** In the 2010–2050 period, **climate change, crop agriculture and infrastructure development** are expected to be the drivers of biodiversity loss with the greatest projected increase.

Figure SPM 14 **The Wetland Extent Trends (WET) index representing the trends in natural wetland extent per region relative to 1970.**

Source: Based on Ramsar Convention secretariat and UNEP-WCMC (2017)[26] and Dixon *et al.* (2016).[27]

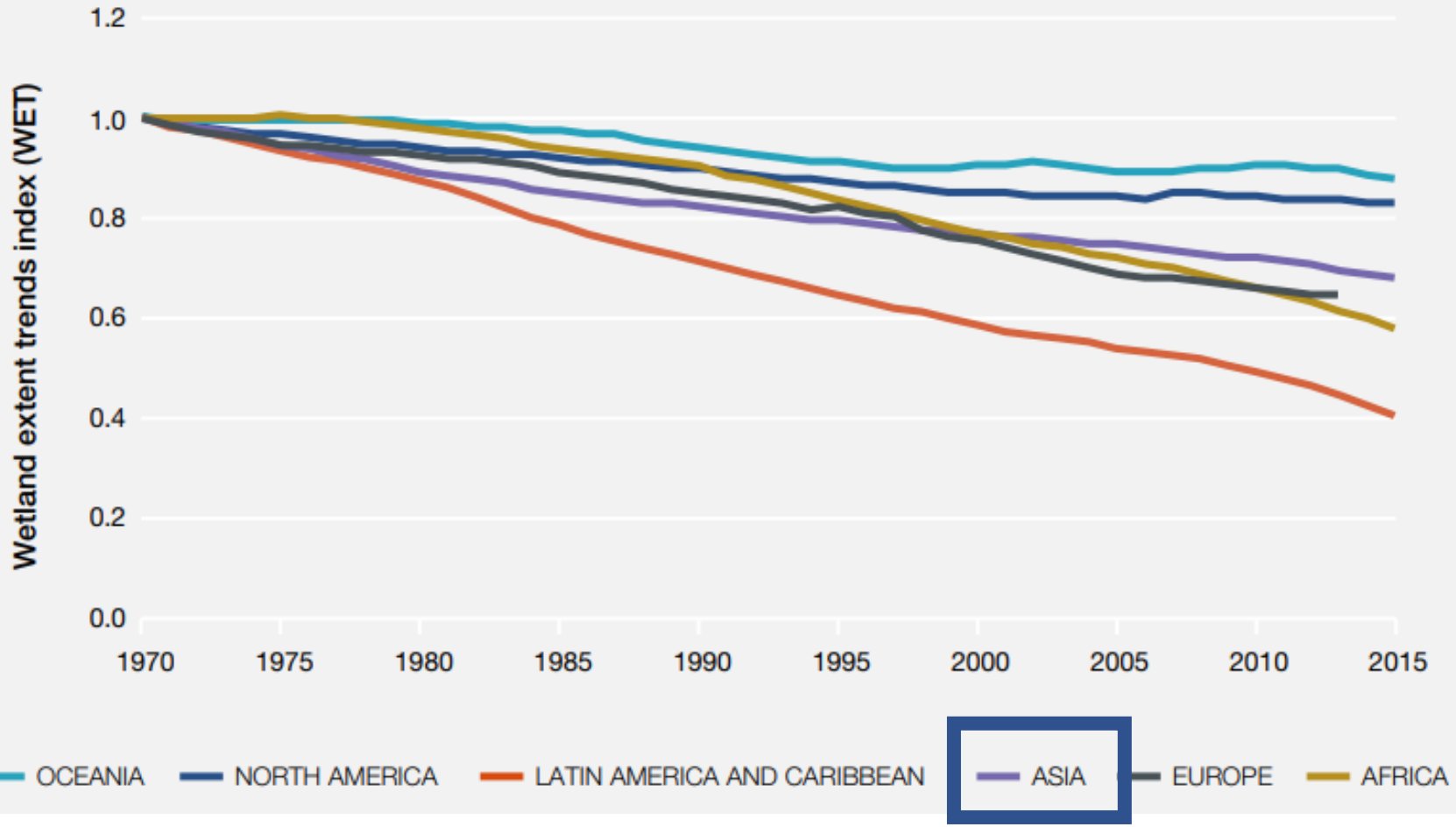
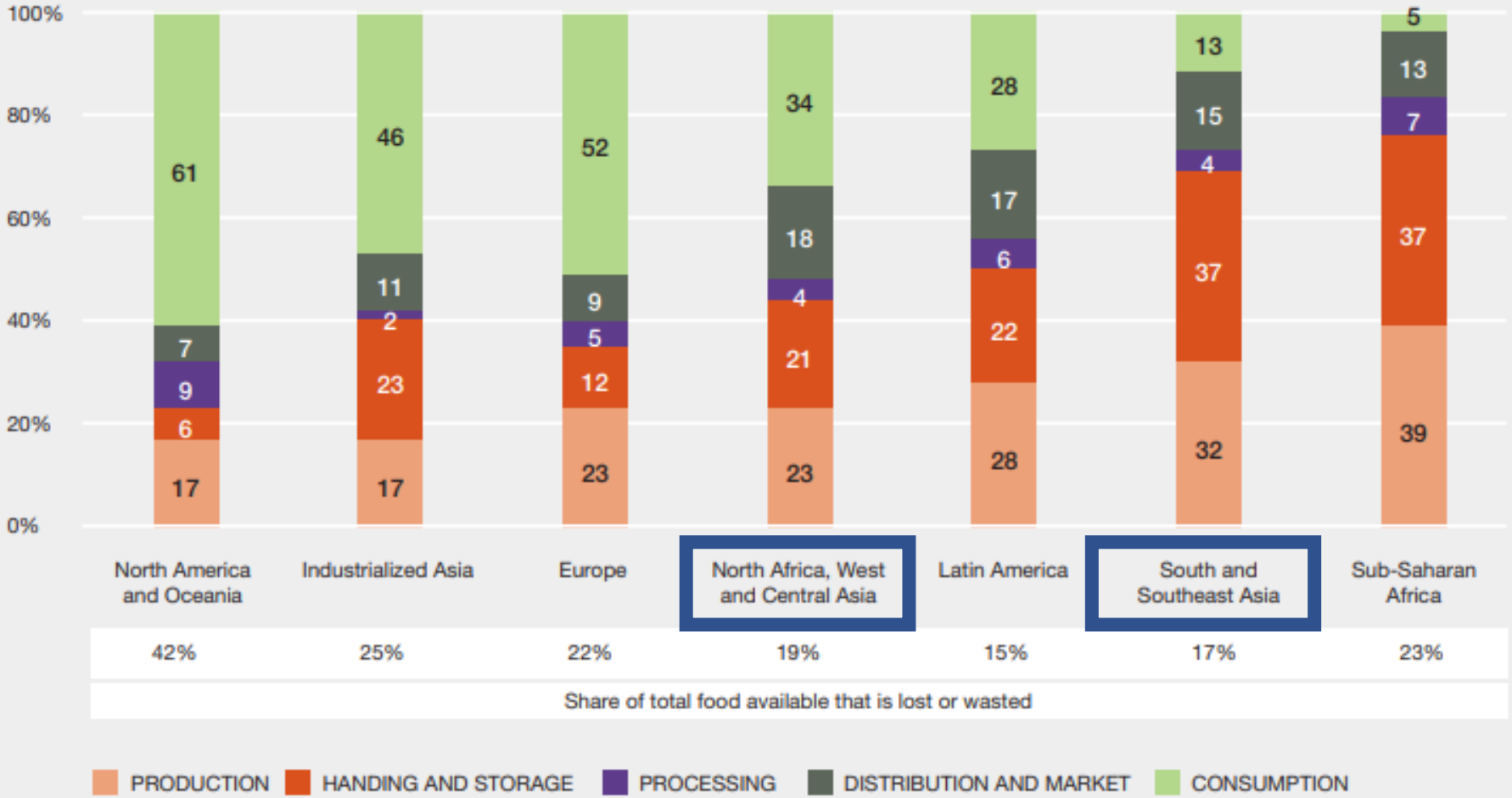


Figure 2 12 Global food losses and food waste - extent, causes and prevention. WRI analysis based on FAO (2011). Source: From Lipinski *et al.* (2013).



Dryland degradation can be seen in the creation of water-related infrastructure resulting in the expansion of irrigated croplands and pastures

- Example - Central Asia/Turkmenistan
- agriculture is almost entirely dependent on irrigation, initially established in the Soviet era and driven, in particular, by a desire to rapidly expand the production of cotton.
- Flaws and inefficiencies in the design of these irrigation systems has led to widespread soil and water degradation due to waterlogging and salinization with significant implications for the country's plans to diversify its agricultural base and enable its food requirements to be met.
- This same pattern can be found across the Aral Sea drainage basin, encompassing much of Turkmenistan, Uzbekistan and Tajikistan and leading to one of the world´s worst examples of desertification

Drivers of land degradation:

- high-consumption lifestyles in the most developed economies, combined with rising consumption in developing and emerging economies
- high and rising per capita consumption, amplified by continued population growth in many parts of the world, can drive unsustainable levels of agricultural expansion, natural resource and mineral extraction, and urbanization – typically leading to greater levels of land degradation.
- IPCC: Data available since 1961 show that **global population growth** and **changes in per capita consumption** of food, feed, fibre, timber and energy have caused unprecedented rates of land and freshwater use with agriculture currently accounting for ca. 70% of global fresh-water use

- By 2014, more than **1.5 billion hectares of natural ecosystems had been converted to croplands.** Less than 25% of the Earth's land surface has escaped substantial impacts of human activity – and by 2050 this will have fallen to <10%.
- **Crop and grazing lands now cover more than one third of the Earth´s land surface**
- Increasing demand for food and biofuels will likely lead to continued **increase in nutrient and chemical inputs and a shift towards industrialized livestock production systems, with pesticide and fertilizer use expected to double by 2050.**

Status, trend and extent of direct drivers of land degradation across subregions globally

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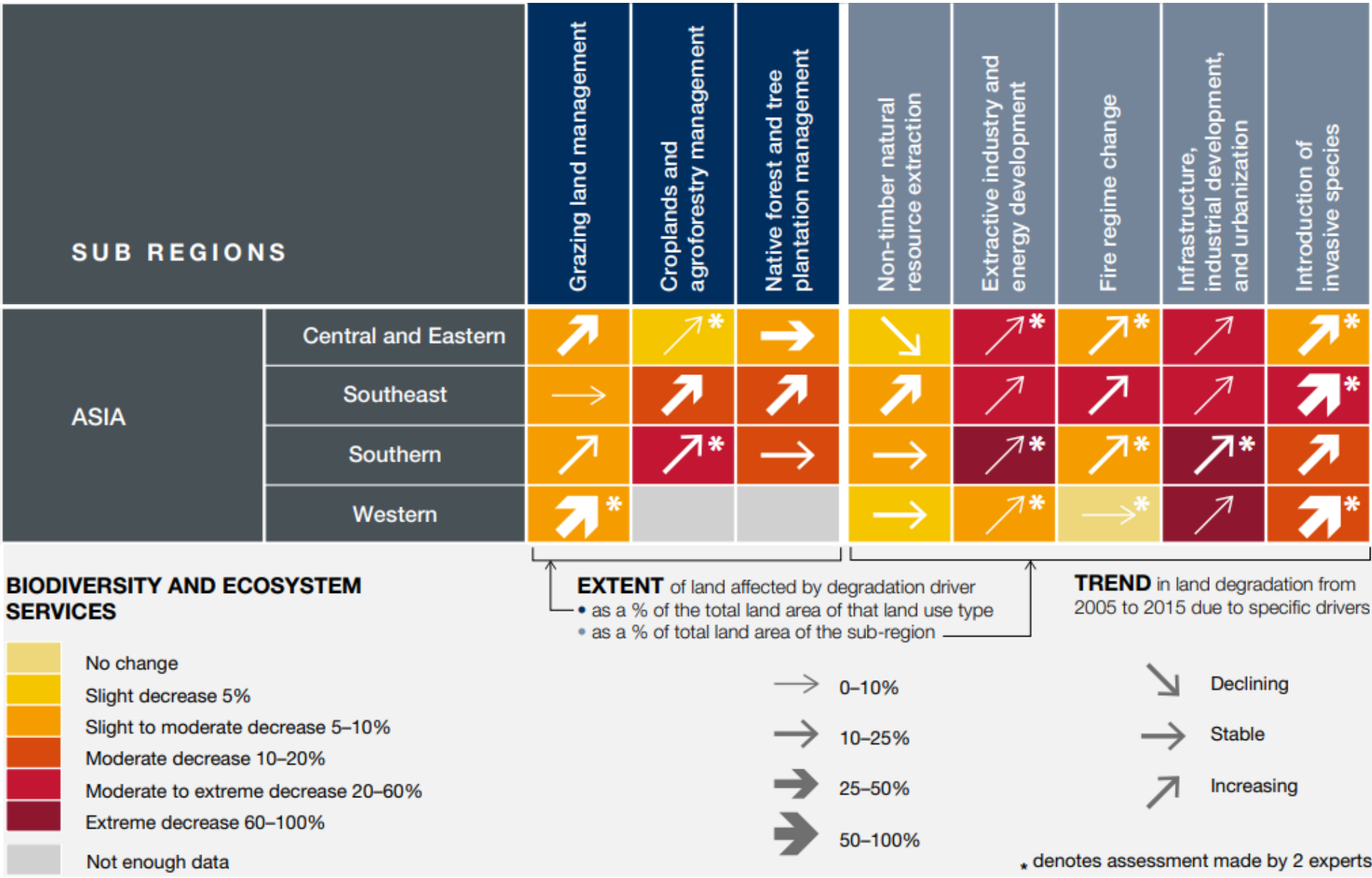


Climate change and land degradation

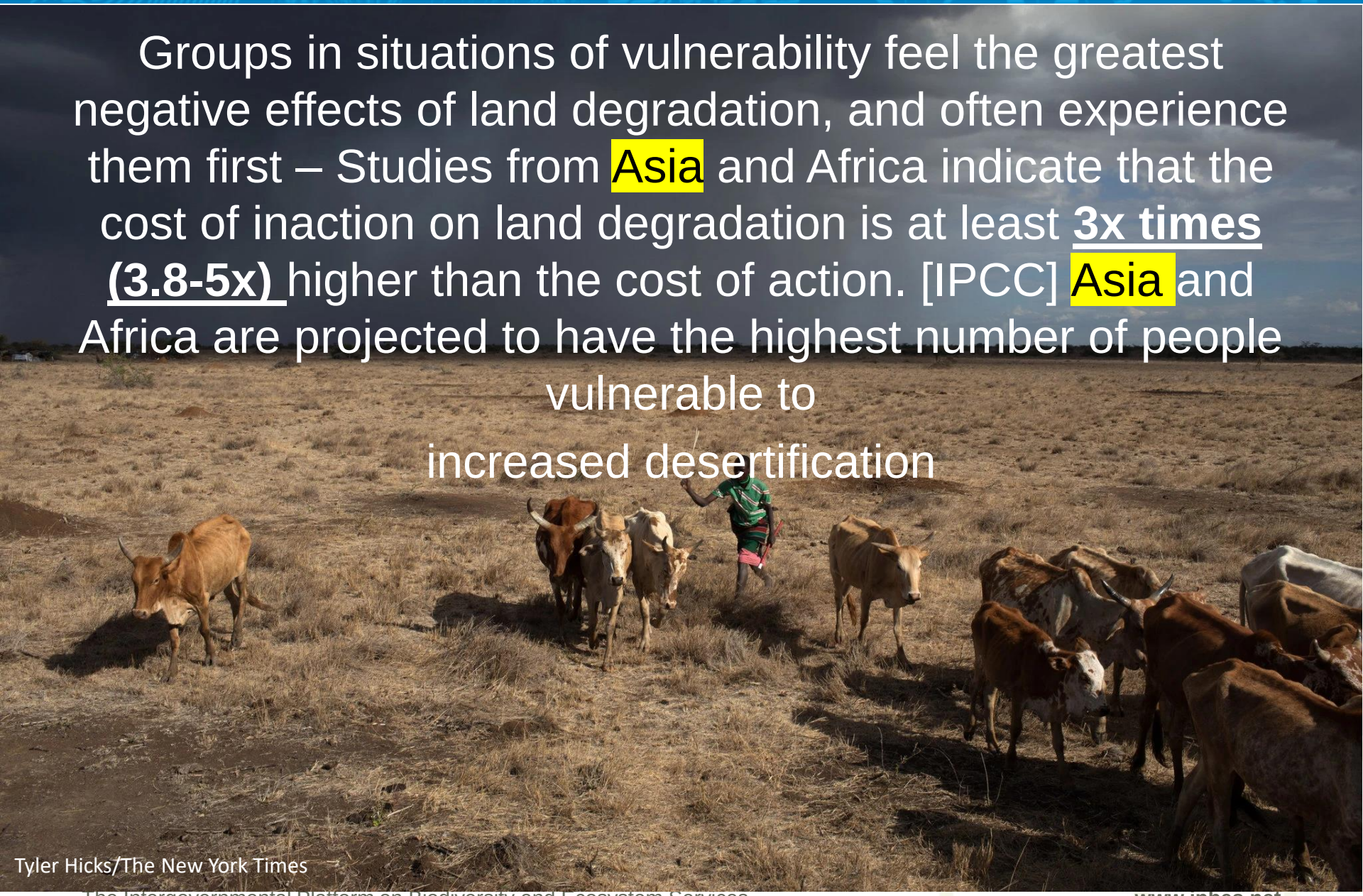
- **land degradation is a major contributor to climate change**, with deforestation alone contributing about 10% of all human-induced greenhouse gas emissions
- Another major driver of the changing climate has been **the release of carbon previously stored in the soil (carbon sequestration by soil)**, with land degradation between 2000 and 2009 responsible for annual global emissions of up to 4.4 billion tonnes of CO2.
- IMPORTANT* **soil's carbon absorption and storage functions =** the avoidance, reduction and reversal of land degradation could provide more than a third of the most cost-effective greenhouse gas mitigation activities needed by 2030 to keep global warming under the 2°C threshold targeted in the Paris Agreement on climate change, increase food and water security, and contribute to the avoidance of conflict and migration.
- Over the past 200 years, **soil organic carbon**, an indicator of soil health, has **dropped an estimated 8% globally** (176 Gt C - equivalent to the carbon that would be lost from clearing an area of tropical forest approximately the size of Australia).
- The impacts of climate change on land degradation include **accelerated soil erosion** on degraded lands as a result of more extreme weather events, increased risk of forest fires, and changes in the distribution of invasive species, pests and pathogens

What does mean in the future?

- In 2010 the population live in drylands and will have increased from 2.7 billion >4 billion (by 2050) - land degradation + climate change will have forced **50-700 million people to migrate**.
- Decreasing land productivity also makes societies more vulnerable to social instability – particularly in dryland areas, where years with extremely low rainfall have been associated with an increase of up to 45% in violent conflict
- By 2050, land degradation + climate change is predicted to **reduce global crop yields by an average of 10%, and by up to 50% in some regions**. In the future, most degradation will occur in Central and South America, sub-Saharan Africa and **Asia** – the areas with the most land still remaining that is suitable for agriculture
- The **capacity of rangelands to support livestock will continue to diminish in the future**, due to both land degradation and loss of rangeland area

Groups in situations of vulnerability feel the greatest negative effects of land degradation, and often experience them first – Studies from Asia and Africa indicate that the cost of inaction on land degradation is at least **3x times (3.8-5x)** higher than the cost of action. [IPCC] Asia and Africa are projected to have the highest number of people vulnerable to

increased desertification



Tyler Hicks/The New York Times

https://www.addisherald.com/land-restoration-makes-progress-in-ethiopia-mongabay/

Available Options

Existing multilateral environmental agreements

Adopt landscape-wide approaches that integrate across sectors

Eliminate perverse incentives that promote degradation

More relevant, credible and accessible information

Coordinated policy agendas that encourage more sustainable production and consumption practices

Table SPM 2 **Aspirations for addressing land degradation and possible actions and pathways.**

The appropriateness and relevance of different aspirations varies from place to place, depending on regional and national contexts. The lists of actions are indicative, non-exhaustive and non-exclusive.

AMBITION	STRATEGY
SAFEGUARDED BIODIVERSITY	Greater protection of biodiversity through enlarged and more effective protected area systems, halting conversion of natural land, large-scale restoration of degraded land, biodiversity offsetting where land transformation is unavoidable
LOW-CONSUMPTION LIFESTYLES	Lower per-capita consumption patterns, including the adoption of less land-degrading diets, such as more vegetable-based diets, and low- and renewable-energy-based housing, transportation and industrial systems
GLOBAL HUMAN POPULATION AT NEAR-ZERO GROWTH	Improving gender equality and moving towards improved access to education, voluntary family-planning, and social-welfare for ageing populations
CIRCULAR ECONOMY	Reduced food loss and waste, sustainable waste and sanitation management systems, reuse and recycling of materials
LOW-INPUT PRODUCTION SYSTEMS AND RESOURCE MANAGEMENT	More land-, energy-, water-, and material-efficient and low-emission production systems for food, fiber, bioenergy, mining, and other commodities
SUSTAINABLE LAND MANAGEMENT	Sustainable land management practices in croplands, rangelands, forestry, water systems, human settlements, and their surrounding landscapes, specifically directed at avoiding, reducing and reversing land degradation

Sustainable Land Management

- The benefits of sustainable land management maintaining ecosystem functions and services, while also supporting human wellbeing, are the primary goals of **sustainable land management** (SLM).
- SLM has great potential and adaptability to local contexts, and can preserve and enhance ecosystem services in all land-use systems.

Sustainable land management is defined as **"the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions."**

- Degradation of water, soil and vegetation, as well as the emission of greenhouse gases (GHGs) that contribute to climate change, can all be addressed by SLM practices that simultaneously conserve natural resources, reduce emissions, and store carbon, among other benefits.
- SLM protects and enhances the multiple services and functions provided by land, which fall into four distinct categories: Provisioning, Regulating, Supporting and Cultural services

Sustainable Land Management

- For example, reducing land degradation through SLM practices could be as low as 20 USD per hectare (UNEP et al., n.d.), if SLM were adopted, the economic rates of return are high, with potential economic rates of return of around 12 to 40 percent for SLM projects in Africa, such as activities that conserve soil and water, manage forests, or provide small-scale irrigation (ELD, 2015).

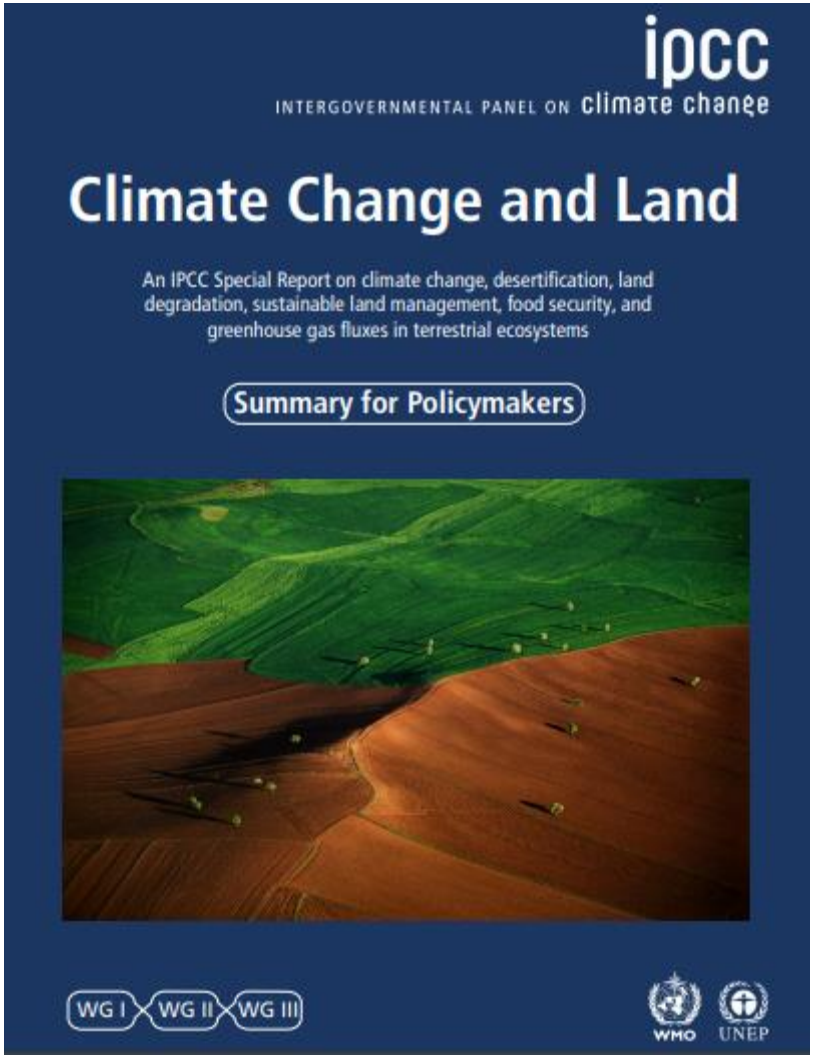
Sustainable Land Management

- SLM is seen as an integral aspect in land use planning and policy, SLM can deliver multiple benefits in relation to national development objectives.
- The ELD Initiative (2015) estimated that adoption of SLM practices and policies could deliver up to **USD 1.4 trillion** in increased crop production worldwide.
- Increasing crop production with SLM practices would support policy makers' attempts to reduce national poverty levels and improve the health and wellbeing of communities, while ensuring ecologically-responsible land management practices.
- At the international level, SLM is an important approach to simultaneously support achievement of **land degradation neutrality (LDN), the Sustainable Development Goals (SDG), and the Rio Conventions.**


One of the UNCCD's main aims is to help countries overcome the barriers to the adoption and scaling up of sustainable land management (SLM) policies and practices needed to reduce poverty, and increase food, water, and energy security for all.

IPCC 2019 Special Report

- This report follows the publication of other recent reports: IPCC Special Report on Global Warming of 1.5°C (SR15), the thematic assessment of **IPBES report on Land Degradation and Restoration, the IPBES Global Assessment Report on Biodiversity and Ecosystem Services**, and the Global Land Outlook of the UN Convention to Combat Desertification (UNCCD).



Key messages

- Land provides the principal basis for human livelihoods and well-being including the supply of food, freshwater and multiple other ecosystem services, as well as biodiversity. Human use directly affects more than 70% of the global, ice free land surface.
- Land also plays an important role in the climate system.
- People currently use **one quarter to one third** of land's potential net primary production for food, feed, fibre, timber and energy.

- Satellite observations have shown vegetation greening over the last three decades in parts of **Asia,** Europe, South America, central North America, and southeast Australia.
- Causes of greening include combinations of an extended growing season, nitrogen deposition, CO2 fertilisation, and land management
- Vegetation browning has been observed in some regions including northern Eurasia, parts of North America, **Central Asia** and the Congo Basin, largely as a result of water stress.
- Globally, vegetation greening has occurred over a larger area than vegetation browning
- The frequency and intensity of dust storms have increased over the last few decades due to land use and land cover changes and climate-related factors in many dryland areas resulting in increasing negative impacts on human health, in regions such as the Arabian Peninsula and broader Middle East, **Central Asia**

UNCCD – COP 14

- Scientific reports relevant to the United Nations Convention to Combat Desertification published in 2018–2019
- **The IPBES Assessment Report on Land Degradation and Restoration;**
- **The IPBES Global Assessment Report on Biodiversity and Ecosystem Services**

Thank you!

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Science and Policy for People and Nature

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