



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

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Worsening Worldwide Land Degradation Now ‘Critical’, Undermining Well-Being of 3.2 Billion People

***Main cause of species loss & driver of
the migration of millions of people by 2050***

***In landmark 3-year assessment report,
100+ experts outline costs, dangers & options***

Worsening land degradation caused by human activities is undermining the well-being of two fifths of humanity, driving species extinctions and intensifying climate change. It is also a major contributor to mass human migration and increased conflict, according to the world’s first comprehensive evidence-based assessment of land degradation and restoration.

The dangers of land degradation, which cost the equivalent of about 10% of the world’s annual gross product in 2010 through the loss of biodiversity and ecosystem services, are detailed for policymakers, together with a catalogue of corrective options, in the three-year assessment report by more than 100 leading experts from 45 countries, launched today.

Produced by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the report was approved at the 6th session of the IPBES Plenary in Medellín, Colombia. IPBES has 129 State Members.

Providing the best-available evidence for policymakers to make better-informed decisions, the report draws on more than 3,000 scientific, Government, indigenous and local knowledge sources. Extensively peer-reviewed, it was improved by more than 7,300 comments, received from over 200 external reviewers.

Serious Danger to Human Well-being

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.

“With negative impacts on the well-being of at least 3.2 billion people, the degradation of the Earth’s land surface through human activities is pushing the planet towards a sixth mass species extinction,” said Prof. Robert Scholes (South Africa), co-chair of the assessment with Dr. Luca Montanarella (Italy). “Avoiding, reducing and reversing this problem, and restoring degraded land, is an urgent priority to protect the biodiversity and ecosystem services vital to all life on Earth and to ensure human well-being.”

“Wetlands have been particularly hard hit,” said Dr. Montanarella. “We have seen losses of 87% in wetland areas since the start of the modern era – with 54% lost since 1900.”

According to the authors, land degradation manifests in many ways: land abandonment, declining populations of wild species, loss of soil and soil health, rangelands and fresh water, as well as deforestation.

Underlying drivers of land degradation, says the report, are the 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.

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, the IPBES experts estimate this will have fallen to less than 10%.

Crop and grazing lands now cover more than one third of the Earth’s land surface, with recent clearance of native habitats, including forests, grasslands and wetlands, being concentrated in some of the most species-rich ecosystems on the planet.

The report says 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.

Avoidance of further agricultural expansion into native habitats can be achieved through yield increases on the existing farmlands, shifts towards less land degrading diets, such as those with more plant-based foods and less animal protein from unsustainable sources, and reductions in food loss and waste.

Strong Links to Climate Change

“Through this report, the global community of experts has delivered a frank and urgent warning, with clear options to address dire environmental damage,” said Sir Robert Watson, Chair of IPBES.

“Land degradation, biodiversity loss and climate change are three different faces of the same central challenge: the increasingly dangerous impact of our choices on the health of our natural environment. We cannot afford to tackle any one of these three threats in isolation – they each deserve the highest policy priority and must be addressed together.”

The IPBES report finds that 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, with land degradation between 2000 and 2009 responsible for annual global emissions of up to 4.4 billion tonnes of CO₂.

Given the importance of 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.

Projections to 2050

“In just over three decades from now, an estimated 4 billion people will live in drylands,” said Prof. Scholes. “By then it is likely that land degradation, together with the closely related problems of 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.”

Dr. Montanarella added: “By 2050, the combination of land degradation and 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 report also underlines the challenges that land degradation poses, and the importance of restoration, for key international development objectives, including the United Nations Sustainable Development Goals and the Aichi Biodiversity Targets. “The greatest value of the assessment is the evidence that it provides to decision makers in Government, business, academia and even at the level of local communities,” said Dr. Anne Larigauderie, Executive Secretary of IPBES. “With better information, backed by the consensus of the world’s leading experts, we can all make better choices for more effective action.”

Options for Land Restoration

The report notes that successful examples of land restoration are found in every ecosystem, and that many well-tested practices and techniques, both traditional and modern, can avoid or reverse degradation.

In croplands, for instance, some of these include reducing soil loss and improving soil health, the use of salt tolerant crops, conservation agriculture and integrated crop, livestock and forestry systems.

In rangelands with traditional grazing, maintenance of appropriate fire regimes, and the reinstatement or development of local livestock management practices and institutions have proven effective.

Successful responses in wetlands have included control over pollution sources, managing the wetlands as part of the landscape, and reflooding wetlands damaged by draining.

In urban areas, urban spatial planning, replanting with native species, the development of ‘green infrastructure’ such as parks and riverways, remediation of contaminated and sealed soils (e.g. under asphalt), wastewater treatment and river channel restoration are identified as key options for action.

Opportunities to accelerate action identified in the report include:

- Improving monitoring, verification systems and baseline data;
- Coordinating policy between different ministries to simultaneously encourage more sustainable production and consumption practices of land-based commodities;

- Eliminating ‘perverse incentives’ that promote land degradation and promoting positive incentives that reward sustainable land management; and
- Integrating the agricultural, forestry, energy, water, infrastructure and service agendas.

Making the point that existing multilateral environmental agreements provide a good platform for action to avoid, reduce and reverse land degradation and promote restoration, the authors observe, however, that greater commitment and more effective cooperation is needed at the national and local levels to achieve the goals of zero net land degradation, no loss of biodiversity and improved human well-being.

Knowledge Gaps

Among the areas identified by the report as opportunities for further research are:

- The consequences of land degradation on freshwater and coastal ecosystems, physical and mental health and spiritual well-being, and infectious disease prevalence and transmission;
- The potential for land degradation to exacerbate climate change, and land restoration to help both mitigation and adaptation;
- The linkages between land degradation and restoration and social, economic and political processes in far-off places; and
- Interactions among land degradation, poverty, climate change, and the risk of conflict and of involuntary migration.

Environmental and Economic Sense

The report found that higher employment and other benefits of land restoration often exceed by far the costs involved. On average, the benefits of restoration are 10 times higher than the costs (estimated across nine different biomes), and, for regions like Asia and Africa, the cost of inaction in the face of land degradation is at least three times higher than the cost of action.

“Fully deploying the toolbox of proven ways to stop and reverse land degradation is not only vital to ensure food security, reduce climate change and protect biodiversity,” said Dr. Montanarella, “It’s also economically prudent and increasingly urgent.”

Echoing this message, Sir Robert Watson, said: “Of the many valuable messages in the report, this ranks among the most important: implementing the right actions to combat land degradation can transform the lives of millions of people across the planet, but this will become more difficult and more costly the longer we take to act.”



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IPBES has today released the Summary for Policymakers (SPM) of the IPBES Assessment Report on Land Degradation and Restoration. The SPM present the key messages and policy options, as approved by the IPBES Plenary.

To access the SPM online go to <https://goo.gl/ERXLNr> The complete report (inclusive of all data) will be published later this year.

Please note: The Assessment report deals with the entirety of land-based ecosystems, including but not limited to soil, and also covering the aquatic ecosystems enclosed and fed by the land, such as rivers and lakes

About IPBES:

Often described as the "IPCC for biodiversity" IPBES is an independent intergovernmental body comprising 129 member Governments. Established by Governments in 2012, it provides policymakers with objective scientific assessments about the state of knowledge regarding the planet's biodiversity, ecosystems and the contributions they make to people, as well as the tools and methods to protect and sustainably use these vital natural assets.

For more information about IPBES and its assessments visit www.ipbes.net

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Highlights

1. Avoiding, reducing and reversing land degradation and restoring degraded land is an urgent priority to protect the biodiversity and ecosystem services vital to all life on Earth and to ensure human well-being.
2. Land degradation through human activities is undermining the well-being of at least 3.2 billion people.
3. Land degradation through human activities is pushing the planet towards a sixth mass species extinction.
4. Widespread lack of awareness of land degradation as a problem is a major barrier to action.
5. Less than one quarter of the Earth's land surface remains free from substantial human impacts. By 2050 it is estimated that this will drop to less than 10% – and this will be mostly in deserts, mountainous areas, tundra and polar areas unsuitable for human use or settlement.
6. Wetlands are particularly degraded, with 87% lost globally in the last 300 years; 54% since 1900.
7. Habitat loss through transformation, and the decline in suitability of the remaining habitat through degradation, are the leading causes of biodiversity loss.
8. Between 1970 and 2012, the index of the average population size of wild land-based species of vertebrates dropped by 38% and freshwater species by 81%.

Projections

1. The population in drylands will have increased from 2.7 billion in 2010 to 4 billion by 2050.
2. The unprecedented growth in consumption, demography and technology will roughly quadruple the global economy in the first half of the twenty-first century.
3. Unless urgent and concerted action is taken, land degradation will worsen in the face of population growth, unprecedented consumption, an increasingly globalized economy, and climate change.
4. Most future degradation is expected to occur in Central and South America, sub-Saharan Africa and Asia.
5. Land degradation and climate change are likely to force 50 to 700 million people to migrate by 2050.
6. By 2050, land degradation and climate change will reduce crop yields by an average of 10% globally, and up to 50% in certain regions.
7. The capacity of rangelands to support livestock will continue to diminish in the future, due to both land degradation and loss of rangeland area.
8. 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.
9. In a middle of the road scenario, the reduction is projected to be equivalent to a complete loss of the original biodiversity of an area about 1.5 times the size of the USA.

Economics

1. The estimated economic cost of biodiversity and ecosystem services lost because of land degradation is more than 10% of annual global gross product.
2. High-consumption lifestyles in more developed economies, combined with rising consumption in developing and emerging economies, are the dominant factors driving land degradation globally.
3. Studies from Asia and Africa indicate that the cost of inaction on land degradation is at least three times higher than the cost of action.
4. The benefits of restoration exceed the costs by an average ratio of 10 to one (estimated across nine biomes).
5. Benefits include increased employment, business spending, local investment in education, and improved livelihoods and gender equity.
6. The full impact of consumption choices on land degradation worldwide is not often visible due to the distances that can separate many consumers and producers.
7. The increasing spatial disconnect between consumers and the ecosystems that produce the food and other commodities they depend upon has resulted in a growing lack of awareness and understanding of the implications of consumption choices for land degradation.
8. Many of those who benefit from overexploitation of natural resources are among the least affected by the direct negative impacts of land degradation, and therefore have the least incentive to take action.

Climate Change Links

1. Land degradation is a major contributor to climate change, and climate change is foreseen as a leading driver of biodiversity loss (along with crop agriculture and infrastructure development) through 2050.
2. The contribution of land degradation to climate change includes the release of carbon sequestered in soil. Between 2000 and 2009, land degradation was responsible for annual global emissions of 3.6–4.4 billion tonnes of CO₂.
3. 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).
4. Without urgent action, further losses of 36 gigatons of carbon from soils - especially from Sub-Saharan Africa – is projected by 2050 (equivalent to nearly 20 years of emissions from the global transportation sector - all freight and passenger traffic by land, air, water and sea). The main processes include deforestation and forest degradation, the drying and burning of peatlands, and the decline of carbon content in many cultivated soils and rangelands because of excessive disturbance and insufficient return of organic matter to the soil.
5. Deforestation alone contributes approximately 10% of all human-induced greenhouse gas emissions, and can further alter the climate through changes in surface reflectivity and the generation of dust particles.
6. In mountainous and high latitude regions, permafrost melt and glacier retreat will result in mass land movements such as landslides and surface subsidence (cave-ins, sinking) and higher greenhouse gas emissions. In forests, the likelihood of wildfires, pest and disease outbreaks increases in scenarios where droughts and hot spells are projected to be more frequent.
7. The impacts of climate change on land degradation include accelerated soil erosion on degrade 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.

8. Strong 2-way interaction between climate change and land degradation mean the issues are best addressed in a coordinated way.
9. Some activities aimed at climate change mitigation can increase the risk of land degradation and biodiversity loss - e.g. expansion of bioenergy crops. Planting trees where they did not historically occur (afforestation), can have an impact similar to deforestation, including the reduction of biodiversity and disruption of water, energy and nutrient cycles.
10. Avoiding, reducing and reversing 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 2°C, increase food and water security, and contribute to the avoidance of conflict and migration.

Human Health and Security

1. Four-fifths of the world's population now lives in areas where there is a threat to water security.
2. Every 5% loss of gross domestic product, itself partly caused by degradation, is associated with a 12% increase in the likelihood of violent conflict.
3. Transformation of natural ecosystems to human use can increase the risk of human diseases such as Ebola, monkey pox and Marburg virus, some of which have become global health risks by bringing people into more frequent contact with pathogens capable of transferring from wild to human hosts. Modifications in hydrological regimes affect the prevalence of pathogens and vents that spread disease
4. Land degradation generally increases the number of people exposed to hazardous air, water and land pollution, particularly in developing countries, with the worst-off countries recording rates of pollution-related loss of life higher than those in wealthy countries.
5. Land degradation generally harms psychological well-being by reducing benefits to mental balance, attention, inspiration and healing. It has particularly negative impacts on the mental health and spiritual well-being of indigenous peoples and local communities.
6. Land degradation, especially in coastal and riparian areas, increases the risk of storm damage, flooding and landslides, with high socio-economic and human costs.

Remedial Options

1. National and international responses to land degradation are often focused on mitigating damage already caused. Policies are typically fragmented in nature, targeting specific, visible drivers of degradation within specific sectors of the economy, in isolation from other drivers.
2. Land degradation is rarely, if ever, the result of a single cause and can thus only be addressed through the simultaneous and coordinated use of diverse policy instruments and responses at the institutional, governance, community and individual levels.
3. Avoiding, reducing and reversing land degradation is essential for reaching the majority of the Sustainable Development Goals and would synergistically support nearly all of them.
4. Land managers, including indigenous peoples and local communities, have key roles to play in the design, implementation and evaluation of sustainable land management practices.
5. Proven approaches to halting and reversing land degradation include:
 - Urban planning, replanting with native species, green infrastructure development, remediation of contaminated and sealed soils (e.g. under asphalt), wastewater treatment and river channel restoration.
 - Better, more open-access information on the impacts of traded commodities.
 - Coordinated policy agendas that simultaneously encourage more sustainable consumption of land-based commodities.

- Eliminating perverse incentives that promote degradation – subsidies that reward overproduction, for example – and devising positive incentives that reward the adoption of sustainable land management practices.
6. Examples of well-tested practices and techniques, both traditional and modern, to halt degradation of agricultural lands include:
- Rangelands:
 - Land capability and condition assessments and monitoring
 - Grazing pressure management
 - Pasture and forage crop improvement
 - Silvopastoral management
 - Weed and pest management
 - Rangelands with traditional grazing in many dryland regions have benefitted from maintaining appropriate fire regimes and the reinstatement or development of local livestock management practices and institutions. A variety of passive or active forest management and restoration techniques have successfully conserved biodiversity and avoided forest degradation while yielding multiple economic, social and environmental benefits.
 - Combating land degradation resulting from **invasive species** involves the identification and monitoring of invasion pathways and the adoption of eradication and control measures (mechanical, cultural, biological and chemical).
 - Responses to land degradation from **mineral resource extraction** include:
 - on-site management of mining wastes (soils and water)
 - reclamation of mine site topography
 - conservation and early replacement of topsoil
 - restoration and rehabilitation measures to recreate functioning grassland, forest, wetland and other ecosystems
 - Effective responses to avoid, reduce and reverse **wetland** degradation include:
 - controlling point and diffuse pollution sources
 - adopting integrated land and water management strategies; and
 - restoring wetland hydrology, biodiversity, and ecosystem functions through passive and active restoration measures, such as constructed wetlands

Comments about the IPBES Land Degradation and Restoration Assessment

“The assessment of land degradation and restoration by IPBES is a wake-up call for us all. It shows the alarming scale of transformation that humankind has imposed on the land and the changing nature of the forces driving land degradation. We live in an increasingly connected world, yet as consumers we are living ever further away from the lands that sustain us. Addressing land degradation location by location is insufficient when consumption in one part of the world influences the land and people in another. The global target of Land Degradation Neutrality requires a new land agenda that ensures we can effectively, sustainably and equitably manage these dynamics.”

- **Monique Barbut, Executive Secretary of the United Nations Convention to Combat Desertification (UNCCD)**

“Unsustainable land use is scarring the Earth for generations. It is costing us billions, impacting human health and contributing to climate change. This report by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems is a comprehensive effort to build credible scientific evidence so we can make much better decisions about land – for our people and our planet.”

- **Erik Solheim, Executive Director of UN Environment**

This report demonstrates the challenges we face due to global soil degradation, and the impact on human life if this critical issue is not urgently addressed. It is now essential to translate the report's recommendations into tangible action. To do this, we will need to put biodiversity and people's well-being at the heart of decision making, and foster interaction between all sectors of society. UNESCO will play its role by bringing experience and mobilizing its resources and networks to build these bridges between culture, education, science local and indigenous knowledge.

- **Audrey Azoulay, Director-General of UNESCO**

“The degradation of land resources undermines our efforts to end hunger. The Land Degradation and Restoration Assessment will be an important guide for our country partners and FAO alike, as it draws on the best available science and local expertise. Managing land resources is critical for ensuring our vision for sustainable food and agriculture, and we are happy to have contributed to this effort. A healthy soil is the backbone of all healthy food system.”

- **José Graziano da Silva, Director-General of the Food and Agriculture Organization of the United Nations**

“Around 12 million hectares of land are lost each year to degradation. In addition to harming the well-being of at least 3.2 billion people, land degradation costs more than 10% of annual global GDP in lost ecosystem services like preventing harmful nutrient run-off into streams or decreasing the effects of floods. Halting and reversing current trends of land degradation could generate up to USD 1.4 trillion per year of economic benefits and go a long way in helping to achieve the Sustainable Development Goals.”

- **Achim Steiner, Administrator of UNDP**