DELHI SCHOOL OF ARTIFICIAL INTELLIGENCE

15 LIFE ON LAND

EDUCATION Ai

Protect, restore & promote terrestrial ecosystems

Artificial Intelligence for Life on Land

Like other environmental SDGs, SDG 15 encounters significant challenges, with only 2 out of 12 targets currently on track. This lack of progress poses a threat to biodiversity, **with the world experiencing its largest species extinction since the Cretaceous Period (dinosaur age),** ongoing forest loss, and land degradation. Additionally, the lack of progress jeopardizes other SDGs, as many communities rely on land safety and biodiversity for survival, directly linking to climate change.

The connection between AI and SDG 15 is well-documented, with numerous UN use cases: 7 out of 40 in AI for Good: Innovate for Impact and approximately 45 use cases out of 408 in the UN Activities on AI.

Particularly, there are several AI applications related to SDG 15 that include monitoring land-use change. Land use change refers to the change of typology of a specific land, such as deforestation or desertification, which is also often used as a proxy for biodiversity impact.

Using satellite images, AI can show what is happening on the ground, thereby helping organizations limit the deforestation of their activities, but also help governments protect those areas. These solutions can also help with planning land management and reforestation.

Additionally, AI can be used to help count and monitor biodiversity. For instance, AI can analyze recorded forest noises or videos to identify the species present, providing insights into the local ecosystem and animal behaviors. This aids scientists in devising effective conservation strategies. Additionally, AI assists the government in anti-poaching efforts by enabling rangers to optimize patrol routes using randomization and historical data for enhanced efficiency and poacher deterrence. These use cases demonstrate the potential of AI to advance SDG 15, but it's crucial to establish guardrails to ensure mutual support between AI and SDG 15. AI's potential for biodiversity preservation must be balanced against the risk of exploitation by poachers or other malicious actors.

Moreover, the development of AI hardware solutions requires specific resources, which could impact land use and contribute to pollution. Similarly, the production and marketing of goods using AI can drive land usage change and biodiversity loss, highlighting the need for careful consideration of AI's environmental impact.

Key Considerations for Stakeholders

- **International collaboration:** Alignment on good practices around AI are important to make sure that all actors can collaborate on those matters.
- **Technology improvement:** To reduce the quantity of energy consumed would be imperative to support the development of SDG 15, hence technologies with less energy requirements should be prioritized.

Impact

AI could act as an (positive) enabler for 100% of the SDG 15 targets and act as an inhibitor (negative) for 33% of the targets.

Use case 1

Monitoring biodiversity status using AI to provide governments with improved information on pathways to protect it.

Use case 2

Using AI to review deforestation to assure to have precise information and make informed decisions.

Use case 3

Implementing AI solutions to help the government prevent poaching.

Life on land

- Global trends underscore persistent challenges to biodiversity and forests, despite their critical roles as planetary life-support systems. Global forest area continues to decline, primarily due to agricultural expansion, despite notable progress in sustainable forest management. Alarmingly, species are silently becoming extinct, the protection of key biodiversity areas has stalled and global illicit wildlife trafficking has steadily increased, posing serious threats to biodiversity and the benefits it provides to people.
- Efforts are under way to tackle these challenges, with countries advancing implementation of access and benefit-sharing instruments and integrating biodiversity values into national accounting systems. There's also a growing global commitment to biodiversity conservation, reflected in increased funding and the adoption of the Kunming-Montreal Global Biodiversity Framework.

A national park manager surveys tree nursery saplings in a desert area of central Saudi Arabia that is being regreened to combat land degradation, desertification and drought.

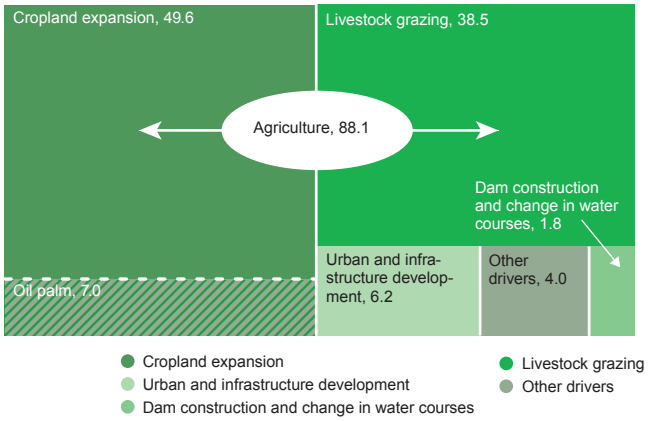
- Urgent action is imperative. Addressing pressing environmental challenges and their underlying drivers and interconnections – including climate change, biodiversity loss, pollution, desertification and deforestation – demands intensified, accelerated efforts, and a comprehensive and integrated approach at local, national and global levels.

Reducing deforestation depends on improving food security, income and land rights

Between 2000 and 2020, the proportion of forest cover decreased from 31.9 to 31.2 per cent of total land area, resulting in net forest area losses of nearly 100 million hectares. Agricultural expansion drove almost 90 per cent of global deforestation; cropland accounted for 49.6 per cent and livestock grazing for 38.5 per cent. Globally, small-scale farming caused 68 per cent of agriculture-driven deforestation, while large-scale farming contributed to 32 per cent. In Africa, small-scale farming was responsible for 97 per cent of agriculture-driven deforestation. Forest losses due to large-scale farming were highest in South America at 48 per cent (mainly linked to livestock grazing), followed by Asia at 38 per cent (due to large-scale crop production, particularly for oil palm plantations). These findings suggest that efforts to reduce deforestation must tackle production system weaknesses while addressing critical needs such as food security, income and land tenure rights for local communities.

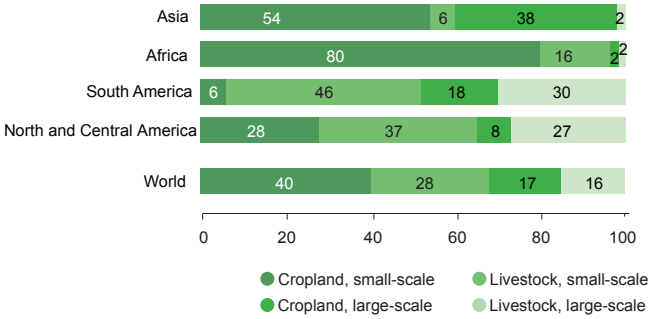
Stemming deforestation also demands a comprehensive approach blending regulatory measures, market incentives and stakeholder collaboration to promote sustainable land management and preserve forest ecosystems.

Main drivers of global deforestation, 2000–2018 (percentage)



Note: "Other drivers" refers to severe degradation affecting natural regeneration whereby forests are transformed into bare soil or other wooded land. Due to rounding, percentages may not add up to 100 per cent.

Share of regional agriculture-driven deforestation associated with large-scale and small-scale livestock and cropland, 2000–2018 (percentage)



Note: Due to rounding, percentages may not add up to 100 per cent.

Risks to species continue to escalate globally

Global biodiversity faces ongoing threats, evidenced by a 12 per cent deterioration in the Red List Index between 1993 and 2024. Over 44,000 species, or 28 per cent of almost 160,000 assessed species, are currently threatened. They include 70 per cent of cycads and 41 per cent of amphibians. The latter are particularly impacted by climate change, habitat conversion and invasive fungal disease. For example, Buckley's glass frog, assessed as Critically Endangered and found only in the Ecuadorian Andes, faces increased extinction risk due to habitat loss from expanding agriculture and livestock grazing, fungal disease and climate change. Regionally, severe biodiversity declines across all species groups are evident in Central and Southern Asia as well as in Eastern and South-Eastern Asia. Stopping the ongoing decline in biodiversity is an urgent race against time, making accelerated conservation efforts imperative to safeguard the irreplaceable and intricate web of life on the planet.

Global Youth AI Advisory Body

Delhi School of Artificial Intelligence