FOOD FORWARD NDCs

Reducing land-use change and conversion of natural ecosystems for food production

Overview

Ambitious policies are urgently needed to:

- **Halt (gross) deforestation**: Forests capture and store large amounts of CO_2 and their protection is essential to achieving global climate goals. Halting gross deforestation means no further clearing of natural forests, irrespective of expansion of forest areas (e.g. through reforestation) elsewhere.
- **Protect high-integrity forests**: High-integrity forests are fundamental for ensuring climate goals. High integrity tropical forests are estimated to remove around **1.8 billion tons of CO_2 per year (net)** from the atmosphere and store this carbon in their trunks, branches and roots. These forests are in areas that are far from deforestation frontiers, and therefore considered not under immediate threat of clearance or degradation. However, they need proactive conservation actions to ensure their preservation in the long term.
- **Halt conversion of grasslands and savannahs** into cropland or other land uses. Grasslands and savannahs represent up to 80% of the world's agriculturally productive land (e.g. as a source of feed for livestock) and face some of the fastest rates of conversion of any biome. They store a large amount of organic carbon in their soils and extensive root systems that, if exposed to the atmosphere (e.g. through tillage), would be mostly released in form of CO_2 emissions. Avoiding conversion of grasslands into

croplands is therefore the foremost strategy to avoid CO_2 emissions from these lands.

- **Protect wetlands**: Wetlands (e.g. **peatland**, **mangrove forests** and other coastal ecosystems) have been long considered unproductive and therefore available for conversion into agricultural land. However, as they are among the most carbon-rich ecosystems, the drainage of even a small fraction of them releases massive amount of CO_2 to the atmosphere. Peat soils contain more than **600 gigatonnes of carbon which represents up to 44% of all soil carbon**, and exceeds the carbon stored in all other vegetation types including the world's forests.

Most conversion of natural ecosystems is driven by expansion of agriculture. In the tropics, **more than 90% of all deforestation** is driven directly or indirectly by agriculture. International export demand for commodities is responsible for up to 25% of this tropical deforestation associated with agricultural production, making efforts to build deforestation- and conversion-free supply chains crucial to ending deforestation and ecosystem conversion.

Concrete measures to implement

Policy measures to address **direct and underlying drivers of ecosystem conversion** in order to deliver sustainable, equitable food systems include:

- Combine incentives and disincentives to protect ecosystems:
    - Identify and address the direct and indirect drivers of ecosystem degradation and conversion from food production at national and subnational levels.
    - Develop and adopt appropriate and context-specific (including both voluntary and mandatory) measures by combining incentives for more sustainable products with regulatory requirements (e.g. moratoria) that prevent commodity production practices linked to deforestation or conversion of natural ecosystem and degradation:
        - Promote the adoption of sustainable food production certification schemes (such as Roundtable for Sustainable Palm Oil for palm oil, Roundtable for Responsible Soy for soy, Rainforest Alliance for coffee, cocoa, others) to support sustainability of operations and practices.

        - Build national monitoring and traceability standards and systems (e.g., the monitoring system under Soy Moratoria in Brazil) for commodity supply chains to enable full traceability of commodities to the production level.
        - Ensure compliance with the legal and regulatory frameworks.
    - Expand and introduce new protected areas and areas covered by other effective conservation measures, particularly in areas with high carbon stocks and conservation value, that are equitably governed and managed and ensure recognition of rights of Indigenous Peoples (IPs) and Local Communities (ICs), including over their traditional territories, and that meet the conditions laid out in Target 3 of the Global Biodiversity Framework.
    - Increase budgets and introduce trainings for relevant public authorities to enable adequate and equitable governance, enforcement and management of protected and conserved areas. Activities in protected and conserved areas should involve collaboration with Indigenous Peoples and Local Communities living in these territories.
    - Create systems for gender-responsive, community-led forest monitoring and pasture management on grasslands and savannahs. Promote involvement of forest communities, pastoralists, IPs and LCs in the monitoring and conservation of protected and conserved areas.
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- Shift production to available degraded land:
    - Define and map degraded land and introduce restoration practices that enable sustainable food production.
    - Develop equitable and accessible mechanisms to support the shifting of production to other land, including capacity building for producers, smallholder farmers and public officials, and enable access to technology and agroecological inputs and financial support.
    - Ensure that the shift of food production to available degraded land and related policy development is underpinned by the full and effective participation of all relevant stakeholders, especially directly

affected IPs and LCs, and the adequate application of free, prior and informed consent (FPIC).

- Assess and prevent imported ecosystem conversion:
    - Assess and address how deforestation and ecosystem conversion and associated emissions are embedded in imported agricultural commodities (e.g. soy, palm oil, cocoa, and cattle). Such an assessment should acknowledge the shared responsibility in addressing these challenges, with consumer countries regulating the import of risk commodities, and both consumer and producer countries increasing consumer awareness around sustainable commodities to reduce deforestation and conversion pressures in producer countries.
    - Assess and address the impact of international and regional trade agreements on deforestation, conversion and degradation and associated human rights violations, and reform them to include environmental and social safeguards that exclude and mitigate these risks.
    - **Establish regulations for sustainable supply chains** that are free from deforestation and conversion of natural ecosystems and implement legislations to dissuade import of products that have an impact of ecosystem integrity. The **European Union Deforestation Regulation** is a good example of such regulations.
    - Promote the import of products certified under sustainable food production certification schemes that ensures **deforestation and conversion-free** production through segregated and identity-preserved supply chains to support sustainability of operations and practices in producer countries.
    - Adopt public procurement policies that favour sustainably produced commodities, based on robust sustainability standards and frameworks. See ***Integrate healthy and sustainable diets in public procurement***.
    - Conduct campaigns to raise awareness among consumers about the environmental impact of ecosystem-risk commodities, and promote the consumption of sustainably produced goods, helping to reduce the demand-driven pressures on forests and other natural ecosystems in producer countries. See ***Increasing demand for sustainable healthy diets***.

- Reform, redirect and repurpose existing public finance and subsidies, and increase finance to enable sustainable, deforestation and conversion-free food production:

    - In line with **Target 18 of the Global Biodiversity Framework**, identify by 2025, eliminate, phase out or reform harmful subsidies for food production in a just, fair, effective, and equitable manner.
    - Conduct a thorough analysis of existing subsidies for food production. Understand the types and amounts of subsidies and identify which ones may be repurposed.
    - Adopt best practices to enable sustainable food production through restoration:

        - Design (repurposed) incentives and subsidies in a way to ensure improvement in soil quality and health to maintain long-term productivity.
        - Repurpose the most harmful agricultural subsidies to promote sustainable agricultural practices that restore land, increasing the cost-effectiveness of these policies.
        - Establish a functioning market for ecosystem services to help people restore more land—and provide more ecosystem services.
        - Ensure that large-scale restoration projects (e.g., afforestation to sequester carbon) do not conflict with IPs, LCs and smallholder farmers land use, food security and food sovereignty, and prevent other "**green grabbing**" practices by governments, investors, or business.

    - Facilitate responsible public and private finance for investments that support sustainable agricultural production, such as lowering import duties for commodities complying with sustainable production standards and/ or explicitly embracing criteria on deforestation and ecosystem conversion.
    - Deploy public nature-based funds, and leverage other sources of funding to focus on systemic solutions at the landscape and jurisdictional level. Because deforestation and conversion drivers are mostly socio-economic in nature, addressing them requires promoting sustainable alternative economies that are not based on the

exploitation of natural resources (e.g. supporting transition to sustainable forest and grassland management).

- Provide and scale technical and financial support to smallholder farmers and producers for sustainable food production focusing on eliminating deforestation and conversion, promoting agroecological approaches and advancing sustainable forest management.
- Provide and increase funding to jurisdictions and sub-national governments that implement zero-deforestation and zero-conversion policies with ambitious and concrete implementation targets, and strengthening sustainable ecosystem management and land use planning, governance and law enforcement in all jurisdictions.

Enabling governance measures

- Inclusive and participatory governance:
  - Adopt integrated land-use planning in coordination with all ministries and national and subnational agencies, including for the zoning and designation of land for conservation, afforestation, reforestation, sustainable forest and ecosystem management, and agriculture.
  - In line with **Target 1 of the Global Biodiversity Framework (GBF)**, develop and implement spatial planning processes that ensure resilient communities through people-centred planning; integrating local knowledge into community-based and traditional management models; incorporating ecological connectivity data into spatial planning decision making; including protection of coastal ecosystems in overall disaster risk reduction frameworks; and ensuring inclusive, gender-responsive stakeholder engagement processes, with measures to ensure transparency and accountability.
  - In line with **GBF Target 22**, ensure inclusive participation and access to justice and information related to biodiversity for stakeholder engagement processes, including measures to ensure transparency and accountability.
  - Adopt gender-responsive land tenure reforms and other measures that enhance women's empowerment and decision-making role, as it relates to land access, management, inclusion, and use. In line with **GBF Target 23**, ensure gender equality and a gender-responsive approach for biodiversity action.

    - Follow the guidance of the United Nations General Comment on Land and Economic, Social and Cultural Rights, to ensure equitable access, use, and control of land.

- Adopt participatory and inclusive approaches to Indigenous Peoples & Local Communities (IPs and LCs), including to:

    - Introduce inclusive and rights-based approaches to conservation, that strengthen and recognize the role of Indigenous Peoples & Local Communities (IPs and LCs) as rights holders of their territories
    - Expand the recognition of IPs' and LCs' territorial rights, and ensure measures are taken to protect them from environmental crimes committed within their jurisdictions.
    - Empower IPs and LCs, and enhance local control and remove institutional barriers preventing them from decision-making for their own ecosystems; and ensure their right to land and resources, customary sustainable use and traditional knowledge and FPIC
    - Invest in communities for sustainable livelihoods and economies, with particular emphasis on ensuring gender equity and enhancing women's empowerment.
    - Avoid "green grabbing" approaches to afforestation for carbon removal that negatively impact IPs, LCs and smallholder farmers' land use, food security, and food sovereignty.
    - Facilitate IPs' and LCs' access to funding mechanisms, and enhance direct channels for accessing finance resources.
    - Empower IPs and LCs to adequately engage and position themselves in global discourse.
    - Enable the integration of IPs' and LCs' knowledge and practices into the design and implementation of nature-based solutions.
    - Support and protect environmental human rights defenders.

- Coherent governance across scales (including aligning on goals across national and subnational, integrated land use planning)

    - Ensure inclusive governance for enhanced social agency, building institutional structures for co-responsibility by investing in local institutions for a stable network of citizens, communities and

community-based organizations, and fair benefit sharing and progressive income distribution.

- Establish policies and governance systems across all scales, ensuring coordination between different sectors and levels of government to effectively implement forest sector mitigation and adaptation activities and control and enforcement measures, including in sectors like agriculture, urban development, infrastructure, mining and rural development, which influence forests and drive deforestation and conversion.

    - Seek alignment between national policies and subnational development plans to ensure coherent implementation across different levels of governance.
    - Align and reform existent institutions and their goals with national ecosystem goals and for the implementation, financing, and monitoring of forest-related policies, ensuring coherence and synergies between different sectors.

- International collaboration to increase finance and technology sharing:

    - Adopt collaborative approaches to mobilize necessary financial resources for implementing the mitigation and adaptation opportunities and explore support from international financial institutions or private sector entities, particularly for developing countries with constrained financial capacities.
    - Promote finance and technology transfer to producer countries to spur innovation in traceability of products, forest monitoring, agroecological practices and supply chain sustainability.

Tools and MRV systems to monitor progress

Assess MRV systems, processes and capacities in the forest sector, including systems established in the context of GHG monitoring and REDD+, and how they can be used for the purposes of tracking progress toward NDCs by developing strategies for alignment, addressing overlaps and setting clear targets, milestones and indicators for mitigation and adaptation that address conversion of ecosystems from food production.

GFW

Global Forest Watch

Link: https://www.globalforestwatch.org/

LUCA

Land Use Change (LUC) Alert

Link: https://global-forest-structure.projects.earthengine.app/view/luca-viewer#alerts=1;lon=-42.384952;lat=4.987819;zoom=3;

Global Tree-Scale Forest Monitoring for Climate Action

Link: https://learn.planet.com/forest-carbon-prerelease?_gl=1*6a3vtu*_gcl_au*ODU3NzU1OTUyLjE2OTI2ODcxMDg.

GLEAM

The Global Livestock Environmental Assessment Model

Link: https://www.fao.org/gleam/en/

Agrifootprint LUC

Calculates the Land Use Change (LUC) footprint for crops

Link:

https://wwfint.awsassets.panda.org/downloads/dcf_critical_for_1_5_pathway___summary_and_techincal_metho

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GLFI – Global Feed LCA Institute

Maintains a database of emissions factors for common animal feed ingredients with data that are ‘at farm’ and ‘at plant’.

Link: https://globalfeedlca.org/gfli-database/

MapBIOMAS

Amazonian Annual Land Cover and Land Use Mapping

Link: https://amazonia.mapbiomas.org/en/

Guides and Handbooks

Land in German Development Cooperation: Guiding Principles, Challenges and Prospects for the Future (GIZ)

Link: https://www.giz.de/de/downloads/giz2016_eng_Land_in_German_Development_Cooperation.pdf

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Land Portal – Global Programme Responsible Land Policy, Systematic Approach

Summary of the Global Programme Responsible Land Policy's systematic approach implemented by the German Development Cooperation with examples.

Link: https://landportal.org/library/resources/systematic-approach-global-programme-responsible-land-policy

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Land Portal – Digital Innovations Global Programme Responsible Land Policy

Recent digital innovations that enable more efficient, effective and transparent land management, with examples in Peru, Ethiopia and Laos.

Link: https://landportal.org/library/resources/digital-innovations-global-programme-responsible-land-policy

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Mitigation benefits

- Reducing deforestation and forest degradation can potentially cut emissions up to 3.6 $GtCO_2$ per year, while enhanced forest and ecosystem management and agroforestry practices could sequester an additional 4.6 $GtCO_2$ annually.
- Protecting existing marine and coastal ecosystems could avoid emissions of 304 million tons of carbon dioxide-equivalent (CO_2e) per year, and large-scale restoration could remove an extra **841 million tons per year by 2030**.

Other environmental benefits

Reducing conversion and degradation of natural ecosystems and their sustainable management preserves and enhances their regulating and supporting services:

- Regulating services include pollination, decomposition, water purification, erosion and flood control, and carbon storage and climate regulation.

Healthy forests regulate local climate and prevent extreme surface temperatures and reduce risks of droughts.

- Supporting services include the underlying natural processes, such as photosynthesis, nutrient cycling, the creation of soils, and the water cycle in ecosystems allow life to sustain on Earth.

Adaptation benefits

- Reduced deforestation enhances ecosystem resilience to climate change threats; and builds societal resilience by mitigating risks of floods and extreme weather, as well as infectious diseases, thus reducing healthcare costs.
- Sustainable Forest Management mitigates adverse climate impacts on ecosystems and societies through responsible forestry practices; and promotes sustainable carbon cycles through wood reuse and reforestation.
- Afforestation provides renewable materials for a **circular bioeconomy**, reducing reliance on high-carbon materials.
- Reforestation reduces vulnerability to climate hazards for both communities and ecosystems.
- Reduced deforestation and sustainable forest management promote food security through increased agricultural yields and availability of arable land; and foster better livelihoods thorough improved incomes and job-creation in forest-related activities.
- Protection of natural or semi-natural ecosystems and restoration of degraded ecosystems enhance ecosystem resilience and their services.

Other sustainable development benefits

Deforestation- and conversion-free food production could contribute significantly to several Sustainable Development Goals (SDGs):

- Reducing deforestation and forest degradation:
    - SDG 15 (Life on land): improved forest management, agroforestry practices, afforestation, reforestation, and forest restoration.

    - SDG 13 (Climate action): mitigating greenhouse gas emissions from deforestation and forest degradation.
    - SDG 6 (Clean water and sanitation): protecting watersheds and maintaining water quality.
    - SDG 12 (Responsible consumption and production): encouraging sustainable forest management and utilization of forest products.
- Combating poverty and promote equity:
    - SDG 1 (No poverty), SDG 5 (Gender equality) & SDG 10 (Reduced inequalities): creating income-generating opportunities through gender-responsive, sustainable forest management and agroforestry practices.
- Ensuring food security:
    - SDG 2 (Zero hunger): supporting agroforestry systems which provide food, feed, and livelihoods.
- Promoting biodiversity:
    - SDG 15 (Life on land): preserving ecosystems and promoting biodiversity through sustainable land and forest management.
- Promoting peace:
    - SDG 16 (Peace, justice, and strong institutions): reducing environmental crime and illegality in affected areas, which ultimately protects populations for improved livelihoods, ensures good governance is in place and tackles some of the most pressing drivers of deforestation and conversion.

Potential challenges, externalities, and trade-offs

- Livelihood risks: If not correctly implemented, reducing deforestation and land degradation may pose risks to smallholder farmers and producers who are dependent on these lands, impacting economic sectors like agriculture, infrastructure, settlements and mining.
- Land use conflicts: Improving forest management, agroforestry and afforestation efforts may cause land use conflicts, particularly regarding

the land needed for these interventions versus other uses.

- Net warming effect: Afforestation and other measures at high latitudes may cause a net warming effect due to **albedo** (i.e., the amount of sunlight earth surface reflects) changes.
- Water and nutrient requirement: These measures could strain local water and nutrient resources, affecting both the environment and other land uses.
- Reduced water availability: Afforestation, especially with unsuitable exotic species, may decrease water availability, leading to conflicts with other land uses and potentially displacing natural non-forest ecosystems.
- Trade-offs in economic development: Implementation of forest protection measures may limit opportunities for economic development, which needs to be carefully weighed against the benefits of such interventions.

Measures to address potential externalities and trade-offs

- Carefully weigh trade-offs between forest goals and other SDGs and consider adjustments in their planning to mitigate any impacts that cannot be avoided.
- **Use field-based indicators** to measure the impacts and track the progress of nature-based solutions against national and international commitments.
- **Choose landscape-scale nature-based solutions** that can provide a solid understanding of the social, economic and environmental context, and deliver multiple benefits for people and nature.
- **Build technical capacity to design**, implement and monitor nature-based solutions.
- Share experiences and progress in a regional context to help identify common challenges, gaps and best practices.
- Design, implement and monitor in close collaboration with local communities directly affected by unsustainable food production.

Implementation costs

- Globally, forest sector mitigation options require costs of which range from about USD 40 to over USD 1,000 per tCO_2.

Intervention in practice

To protect **Brazil's Cerrado**, WWF is working to secure the habitat of endangered species like the giant armadillo and maned wolf. Through habitat restoration and rehabilitation of degraded pastures, the aim is to promote sustainable land use. This includes the effective management of protected areas. WWF also supports traditional communities in adopting sustainable practices to produce native goods, improving both livelihoods and conservation efforts. Additionally, WWF collaborates with public and private sectors, leveraging governance, international markets, financial interventions and advocacy to halt land conversion.

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