POLICY BRIEFS IN SUPPORT OF THE UN HIGH-LEVEL POLITICAL FORUM 2026

Energy and Life on Land: SDG7 and SDG15 Interlinkages

SDG7 POLICY BRIEFS IN SUPPORT OF THE UN HLPF 2026

This document is part of a series of policy briefs compiled by the multistakeholder SDG7 Technical Advisory Group (SDG7 TAG) in support of the review of SDG7 at the High-level Political Forum (HLPF) 2026. Convened by UN DESA, the SDG7 TAG is composed of over 40 experts from governments, UN organizations, international organizations and other stakeholders. The HLPF is the central United Nations platform for the follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) at the global level. More information on the SDG7 TAG, including previous editions of the annual SDG7 Policy Briefs, is available here.

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KEY MESSAGES

- **Achieving both Sustainable Development Goal (SDG) 7 and SDG15 requires transforming the energy transition. This transformation is one that includes agrifood systems and seeks to achieve its goals while halting biodiversity loss, protecting land resources and ensuring food security, while also reducing emissions.**

  SDG7 targets access to affordable, reliable and sustainable modern energy for all. At the same time, SDG15 aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation, while also halting biodiversity loss.

  As this policy brief shows, ecosystems, biodiversity, the environment and resilience (the concerns of SDG15) can all benefit significantly from the expansion of renewable energy and the transition away from fossil fuels (the concerns of SDG7), if sustainability and food security remain at the core of policies and plans.

  Indeed, if long-term sustainability is to be ensured, it is essential to guarantee that the development of energy infrastructure is not in competition with food production, the preservation and sustainable use of biodiversity, and land rights. In addition, the broader ecological footprint of energy systems must be addressed. All this requires energy infrastructure planning that factors in ecological impacts, food security, social equity and inclusive stakeholder engagement – particularly with farmers and rural producers.

  Sustainable energy solutions, which range from solar photovoltaic (PV) to biogas, can transform agricultural waste into energy and reduce reliance on fossil fuels. They can also offer opportunities in achieving the goals of the energy transition, food security and SDG15 all at the same time

- **Integrated policies, strong stakeholder collaboration and adequate finance are key to this transition**.

  For Indigenous people, smallholder farmers, rural communities and women in particular, inclusive governance and strong rights protection are vital in ensuring that the energy transition is just and equitable. It is also vital to adopt an integrated approach – one that ensures the transition is in line with a transformation towards a sustainable and resilient agrifood system. This involves the protection of food security and nutrition. It also involves the sustainable management, use and preservation of land, water, biodiversity and genetic resources.

  Through cross-sectoral coordination, the renewable energy transition, sustainable management of land and water resources, and food security can all be managed effectively. Such coordination is vital in supporting both global sustainability goals and local development needs at the same time. It can also enhance agricultural productivity, rural electrification and food security, while minimizing land-use conflicts.

- **Integrated land-use planning must also safeguard wildlife habitats, maintain ecological corridors and respect indigenous land rights.**

  As global energy and food demands rise, competition for land and water resources increases, posing significant risks to ecosystems, biodiversity and land rights. Without integrated planning, this growing pressure can lead to deforestation, biodiversity loss, land degradation, food insecurity and conflict over land tenure and use. This is especially so in vulnerable communities and ecosystems, including displacement settings.

  To ensure that energy transitions do not create further social or environmental vulnerabilities and put food security at risk, it is therefore important to draw on existing methodologies, frameworks and tools. These can provide guidance for integrated land-use planning. Examples include the Framework for Integrated Land Use Planning (ILUP)[1] from the Food and Agriculture Organization (FAO).

- **Clean energy solutions can help reduce pressure on forests and contribute to forest landscape restoration.**

  Such solutions include innovative technologies that use processed biomass for heat and power production at an industrial level, as well as clean cooking systems. Other clean cooking alternatives, such as biogas, ethanol and electric cooking, are also becoming increasingly viable. At the same time, by-products of bioenergy generation, such as biodigestate and biochar, can potentially contribute to the restoration of degraded soils by replenishing soil nutrients. This increases agricultural yields and enhances the efficiency of resource use by enabling a circular economy approach. In addition, solar PV systems can support the maintenance of grasslands and help reduce desertification, contributing to broader land restoration goals. All these solutions also offer co-benefits for livelihoods by improving agricultural productivity and creating new economic opportunities.

- **Strategic environmental and social assessments, participatory land-use planning and siting criteria should guide the development of renewable energy projects and associated infrastructure.**

  These tools ensure that biodiversity, human rights and community benefit sharing are fully considered. To minimize land-use conflicts and other negative impacts, it is important to prioritize low-impact siting options, such as the use of land that is unsuitable for cultivation. It is also important to prioritize the adoption of sustainable agricultural management practices, such as crop rotation and cover crops. Dual-use models, such as agrivoltaics – which integrate agriculture with solar PV – can help balance energy needs with sustainable land use and contribute to the SDG15 targets. Where possible, existing infrastructure, such as rooftops, should be utilized for renewable energy installations in order to minimize land-use change and habitat disruption.

- **Efficient monitoring of the state and use of natural resources is key in ensuring that renewable energy development takes place in a sustainable manner, consistent with land conservation and restoration constraints.**

  Developing policies and incentives that reward the deployment of energy systems that have a low land-impact can help redirect investments toward sustainable technologies and practices. At the same time, such policies can support the restoration of land and ecosystems. Monitoring should also capture the impact of energy system deployment on agricultural productivity, soil health and water-use efficiency.

1. Energy and Life on Land: SDG7 and SDG15 Interlinkages

Energy and land systems are strictly interconnected. The trade-offs and potential synergies between them are therefore vital in ensuring long-term sustainability and in achieving the SDG7 and SDG15 goals.

Energy system expansion involves a variety of challenges that must be carefully managed. The availability of land, its condition, management and competing uses are all critical factors in energy planning. Renewable energy infrastructure, too, can place additional pressure on already strained land ecosystems. Most of this pressure can be avoided or minimized, however, by careful planning and policy measures.

At the same time, land resources play a central role in numerous global issues, such as food security, biodiversity conservation, climate change, ecosystem resilience and human rights protection. Sustainable land management must therefore consider competing uses and demands, as land can potentially serve multiple and sometimes conflicting purposes. Without integrated planning, renewable energy expansion risks causing ecological fragmentation, loss of biodiversity, soil and water depletion or degradation of critical habitats. This, in turn, has an adverse impact on agricultural production, while uncoordinated renewable energy expansion may affect both food security and rural livelihoods.

Despite these challenges, when well-integrated into broader land management strategies, renewable energy systems can also bring a range of environmental and social benefits.

As an example, bioenergy systems that use agricultural residues can be sustainably integrated with waste management strategies. In this way, while generating clean energy for the benefit of agrifood systems and other sectors, they can also reduce the potential contamination of surface and water resources, while also cutting emissions of greenhouse gases (GHGs) and other air pollutants. At the same time, the use of bioenergy by-products, such as biochar and biodigestate, can support soil health, contributing to ecosystem restoration and biodiversity goals. Similarly, solar and wind installations can be co-located on agricultural land, installed along existing infrastructure, or placed on unsuitable land – potentially adding value to otherwise marginal areas.

The above approaches can also reduce pressure on high-value conservation areas while promoting land rehabilitation and climate adaptation. Moreover, improved energy access through renewable energy interventions can enhance water availability. It achieves this via improved irrigation and pumping systems, which can also increase agricultural yields and enable more efficient land use.

These synergies can contribute to the diversification of rural livelihoods, improve land, protect biodiversity and sustain agricultural production. Integrated resource management frameworks and lifecycle analyses can help balance energy production with the conservation of terrestrial ecosystems, enhancing soil functions and nutrient cycles.

Meanwhile, recent global trends highlight both the importance and urgency of the clean energy transition, as well as the potential risks to land systems.

In 2023, renewable energy accounted for 29.9 per cent of global electricity generation, up from 25.8 per cent in 2019.[2] Similarly, the share of renewables in total final energy consumption reached 13.5 per cent in 2023, increasing from 16.7 per cent in 2015.[3,4] By reducing dependence on fossil fuels, this growth has brought several environmental benefits. It can, however, potentially lead to new land-use conflicts, especially in regions with weak governance or fragile ecosystems.

Similarly, the use of traditional biomass for energy, such as burning firewood and charcoal for cooking, remains widespread. Globally, around 2.1 billion people still rely on solid biomass fuels as their primary source of energy for cooking and heating. This biomass is refers mostly to firewood and charcoal burned in open fires, with this taking place predominantly in sub-Saharan Africa and South Asia.[5] The situation is more acute in displacement settings, as over 80 per cent of refugees living in camps still depend on firewood for cooking.[6] It is estimated that without urgent action, 1.8 billion people will still be dependent on traditional stoves and fuels for cooking in 2030.[7] Wood fuel accounts for approximately 50 per cent of total global roundwood removals, with between 1.9 billion cubic metres and 2.3 billion cubic metres consumed annually for energy purposes.[8] This extensive use can contribute significantly to deforestation and forest degradation, especially when harvesting is unsustainable. Moreover, indoor air pollution from burning wood fuel with inefficient stoves poses severe health risks, disproportionately affecting women and children.

Terrestrial ecosystems also continue to face increasing pressures. As of 2025, the world had a total forest area of 4.14 billion hectares, covering approximately 32 per cent of the global land area. Since 1990, an estimated 489 million hectares of forest have been lost, globally, through deforestation, although the pace of loss has slowed significantly. Between 1990 and 2000, the annual rate of net forest loss was 10.7 million hectares, while between 2015 and 2025, the annual rate of loss was 4.12 million hectares. This rate remains a concern, however, as losses are still occurring at an unsustainable rate.[9]

In addition, each year between 2015 and 2019 at least 100 million hectares of healthy and productive land were degraded, affecting global food and water security and impacting around 1.3 billion people.

Urban expansion, deforestation and grassland conversion – as well as the rise of energy demand coupled with climate change – are direct drivers of land degradation, worldwide.[10] At the same time, FAO estimates that 1.66 billion hectares of land – a figure corresponding to more than 10 per cent of the world's land area – have been affected by human-induced degradation.[11] The above figures underscore the need for a more integrated approach – and one that recognizes the dual priorities of clean energy development and land conservation.

Assessing the Necessary Changes

To achieve alignment between SDG7 and SDG15, several systemic challenges need to be addressed:

- **Although some major renewable energy markets have integrated environmental impact assessments and land-use permitting into their renewable energy planning and development processes, in many other contexts, a key barrier remains the lack of coordination between energy planning and land governance.**

  In particular, most developing countries have not yet fully integrated environmental and land considerations into their renewable energy development strategies. This disconnect can result in unintended ecological impacts and missed opportunities for integrated solutions.

  Land tenure insecurity – particularly in agricultural, rural and forested areas – further complicates the situation, undermining efforts to protect biodiversity and restore degraded ecosystems. This insecurity can create uncertainty around land access and ownership, which complicates long-term planning for renewable energy projects and natural resource management. It also increases the risk of conflict and displacement, particularly for Indigenous peoples and local communities.

  Without improved integration and careful managing, the expansion of renewable energy systems can potentially contribute to deforestation, habitat loss and competition with food production. Promoting land management practices that protect soil structure, maintain organic matter and support nutrient cycling is essential to preserve the long-term productivity of both energy and agricultural systems. These practices also contribute to land degradation neutrality. They also help maintain the ecological integrity of landscapes that are under increasing pressure from climate change and development.

  Ensuring a just energy transition requires robust sustainability assessments that account for competing land uses and risks that are ecological, as well as social.

- **Many countries lack strategic environmental and cumulative impact assessment frameworks for the energy sector, resulting in planning processes that overlook broader ecological consequences.**

  Limited financing for integrated approaches – such as clean cooking, combining renewable energy with agriculture, forestry or conservation – further constrains progress. Strengthening regulatory frameworks, mobilizing adequate finance and building institutional capacity are critical to mainstreaming nature-positive energy solutions that deliver co-benefits for climate, biodiversity and livelihoods, especially for rural communities.

2. Policy Implications and Recommendations

1) **Agrifood system solutions can simultaneously address SDG7 and SDG15, while also delivering the SDG1 goal of an end to poverty and the SDG2 goal of zero hunger.**

   Such solutions, which include the restoration of degraded agricultural land, can help build resilience, reduce GHG emissions, increase sequestration and strengthen food security. At the same time, they can also take account of the spatial and ecological impacts of renewable energy expansion. Indeed, renewable energy infrastructure should be developed using a planning approach that takes account of competing land uses and ecosystem integrity. Such approaches should also be undertaken without compromising food security (SDG2) or livelihoods (SDG1).

   Agrivoltaics and the use of land for renewable energy generation that is unsuitable for cultivation are example solutions for achieving a balance between SDG targets. Another solution may be sustainable bioenergy generation. Such pathways ensure alignment between the achievement of SDG7 goals and biodiversity protection and land restoration. In addition, in order to avoid negative impacts on critical habitats and ecological corridors, spatial planning tools should be complemented by biodiversity monitoring frameworks. These should align with the Kunming Montreal Global Biodiversity Framework (KMGBF), enabling informed siting decisions and adaptive management.

2) **Renewable energy systems with a low impact on the terrestrial landscape and on ecosystems should be prioritized within national and international action plans. Specific instruments and incentives should also be put in place in order to promote such systems.**

   Governments should prioritize incentives for land-efficient technologies such as agrivoltaics and floating PV. They should also apply carbon taxes on emissions resulting from unsustainable land-use practices. Renewable energy deployment should be aligned with land restoration and conservation goals.

   Mobilizing investments towards these goals requires:

   - innovative financing mechanisms, including blended finance models that combine public and private capital
   - carbon markets that reward emissions reductions
   - payment for ecosystem services schemes that incentivize biodiversity conservation and sustainable land stewardship.

3) **The implications of renewable energy expansion on land-use, biodiversity and food security should be integrated into climate policies and land-use planning frameworks.**

Multilateral support, through financing and technical assistance, should prioritize capacity-building for integrated land-energy planning, particularly in biodiversity-rich regions. Such support should also be provided to smallholder farmers and rural communities whose livelihoods depend on land, biodiversity and agricultural production.

4) **Integrated land-energy-climate frameworks for coherent policymaking should be institutionalized. Integrated approaches should guide national and sub-national planning to ensure policy decisions related to the development of the energy sector can reflect land, biodiversity and water constraints. At the same time, such approaches should also enhance cross-sectoral coordination and accountability. These frameworks should be supported by inter-ministerial coordination mechanisms and capacity-building programmes for local authorities and planners.**

5) **Sustainable bioenergy and clean cooking solutions should be prioritized, as these can play a pivotal role in combating deforestation and land degradation.**

Bioenergy derived from agricultural and forestry residues, or from biomass from degraded lands, can offer a low-emissions energy source that does not increase pressure on forests – provided fuels are properly harvested, stored and applied. Expanding access to clean cooking solutions further reduces dependence on wood fuel or charcoal, relieving pressure on forest resources and contributing to healthier and more sustainable livelihoods. This is especially the case in rural and low-income areas, and notably for women and girls. Alongside biomass-based strategies, other clean cooking solutions – such as biogas, ethanol and electric cooking – are becoming increasingly affordable and scalable. Such solutions should be promoted for their broader health, environmental and development co-benefits.

6) **Monitoring systems should be strengthened, ensuring that they are inclusive, adaptive and locally grounded.**

Indicators to assess renewable energy and land-use interactions should be developed through participatory processes with relevant stakeholders and local communities. Monitoring should be responsive to social and ecological changes. It should also draw on scientific tools to guide real-time policy adaptation. To ensure a holistic approach, monitoring frameworks should track biodiversity outcomes, land tenure impacts and impacts on food security and ecosystem service changes.

Monitoring should also include transparent reporting mechanisms and participatory oversight involving youth, Indigenous peoples and local communities to ensure accountability and intergenerational fairness. To ensure a just transition, data-driven approaches must translate into tangible social and environmental impacts.

7) Just transitions can be achieved through inclusive governance and the protection of rights – including those of agricultural workers and communities.

Clean energy policies must uphold land and tenure rights, especially for Indigenous people, women and marginalized communities. Participatory planning, benefit-sharing and access to justice are critical for equitable outcomes across land-energy systems. Legal frameworks should recognize customary land rights and ensure that energy investments do not displace communities or undermine local stewardship of natural resources. Such frameworks should also integrate gender-responsive and age-responsive approaches across energy and land-use planning, while ensuring the participation of youth and women in monitoring and benefit-sharing mechanisms.

Endnotes

[1] https://openknowledge.fao.org/items/6adb6c14-e656-4e7a-96d9-44a7f88d446b.

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[5] See endnote 3 above.

[6] See GPA, *The state of the humanitarian energy sector: Challenges, progress and issues in 2022,* Global Platform for Action on Sustainable Energy in Displacement Settings, UNITAR Publishing, Geneva, https://www.humanitarianenergy.org/assets/resources/SOHES.pdf (accessed 4 December 2025).

[7] See UNDP, *Policy Brief – No time to waste: Pathways to deliver clean cooking for all, a UNDP approach and policy guide,* United Nations Development Programme, New York, 2025, https://www.undp.org/publications/no-time-waste-pathways-deliver-clean-cooking-all-undp-approach-and-policy-guide (accessed 4 December 2025).

[8] See FAO, *The State of the World's Forests: Forest pathways for green recovery and building inclusive, resilient and sustainable economies,* Food and Agriculture Organization (FAO), Rome, 2022, https://openknowledge.fao.org/server/api/core/bitstreams/f81551bf-0a78-498b-a0a6-17f21467389d/content (accessed 4 December 2025).

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[10] See United Nations, *The Sustainable Development Goals Report: Special Edition*, United Nations, New York, 2023, https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf (accessed 4 December 2025).

[11] See FAO, *The State of the World's Land and Water Resources for Food and Agriculture*, FAO, Rome, 2025, https://openknowledge.fao.org/items/70c15b6b-b563-40bf-a4d5-2151bc5dbd3b (accessed 4 December 2025).

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