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**Avoiding, reducing and reversing land and soil degradation of agricultural lands**

# Avoiding, reducing and reversing land and soil degradation of agricultural lands

## Note by the secretariat

*Summary*

By its decision 19/COP.16, the Conference of the Parties invited the Food and Agriculture Organization of the United Nations (FAO) and other relevant partners, working within their respective mandates and procedures, to collaborate to provide guidance to Parties on promoting sustainable land use and responsible governance to prevent and reverse the degradation of agricultural lands and soils, and on promoting sustainable and diverse cropping systems and crops to improve food security and nutrition in the context of climate change and environmental degradation.

The present document summarizes the background, rationale, structure and key messages of that guidance and its companion compilation of activities, tools and an associated digital landing page on the Agrifood Systems Technologies and Innovations Outlook Knowledge Base. This document highlights the strategic importance of agricultural lands to land degradation neutrality, food security, ecosystem services and rural livelihoods. It emphasizes that effective action depends not only on biophysical measures but also on enabling conditions that strengthen tenure security, participation, inclusive finance, value chains, innovation and equitable benefit-sharing for farmers, Indigenous Peoples, pastoralists, local communities and other land users.

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# I. Background

1. By its decision 19/COP.16, the Conference of the Parties (COP) to the United Nations Convention to Combat Desertification (UNCCD) invited the Food and Agriculture Organization of the United Nations (FAO) and other relevant partners, working within their respective mandates and procedures, to collaborate to provide guidance to Parties on promoting sustainable land use and responsible governance to prevent and reverse the degradation of agricultural lands and soils and on promoting sustainable and diverse cropping systems and crops to improve food security and nutrition in the context of climate change and environmental degradation.

2. Agricultural lands, including cropland and rangelands, are central to achieving food security and nutrition objectives, climate and biodiversity objectives, and land restoration at scale, yet these lands have received less restoration attention than ecosystems with high biodiversity value. Where agricultural lands and soils are not restored or managed sustainably, efforts to restore land and ecosystems elsewhere are unlikely to have positive impacts at scale, and pressures to convert natural ecosystems to agriculture are likely to increase.

3. In response to decision 19/COP.16, the secretariat collaborated with FAO and other partners to develop guidance on avoiding, reducing and reversing the degradation of agricultural lands and soils. The guidance, titled "Living soils, productive lands, resilient landscapes: Guidance on avoiding, reducing and reversing the degradation of agricultural lands and soils",[1] helps develop context-specific pathways for addressing the degradation of productive lands and for contributing to land degradation neutrality (LDN), food security and nutrition objectives, and the provision of ecosystem services. The guidance succeeds in this by promoting integrated land use planning and sustainable land use systems for LDN, sustainable land and water management, and diversified production systems across croplands, grasslands, pasturelands, rangelands and supporting ecosystems.

4. The guidance was prepared through a consultative process, including peer review by five key UNCCD constituencies (i.e. national focal points, science and technology correspondents, intergovernmental organizations, civil society and the private sector), as well as consultation and feedback sessions during international events.[2] These were followed by a review process in which stakeholders of both FAO and UNCCD were given the opportunity to provide written comments, which were then considered in producing the final draft of the guidance.

5. The present document summarizes the background, rationale, structure and key messages of the guidance and its companion compilation of activities, and it presents the associated digital landing page on the Agrifood Systems Technologies and Innovations Outlook Knowledge Base (ATIO KB) as a means to ensure that Parties and other stakeholders have sustained access to curated and up-to-date technical and enabling resources. It is intended to support the Committee on Science and Technology (CST) in formulating conclusions and recommendations for consideration by the COP.

# II. Evidence base and rationale

6. The guidance is non-prescriptive and is intended to be adaptable to diverse institutional, ecological and socioeconomic contexts while recognizing national

[1] See https://www.unccd.int/resources/manuals-and-guides/living-soils-productive-lands-resilient-landscapes-guidance-avoiding.

[2] Global-Hub on Indigenous Peoples' Food Systems, 13–17 October 2025, World Food Forum, Rome, Italy; Youth Assembly, 13–17 October 2025, World Food Forum, Rome, Italy; the twenty-third session of the Committee for the Review of the Implementation of the Convention, 1–5 December 2025, Panama City, Panama; the Second International Conference on Agrarian Reform and Rural Development (ICARRD+20), 24–28 February 2026, Cartagena, Colombia; Désertif'actions conference, 25–28 March, Djerba, Tunisia; and contributions from the private sector though a consultation process conducted by the World Business Council for Sustainable Development in 2026.

circumstances and priorities. It is designed to support national focal points and science and technology correspondents of the UNCCD working with FAO Country Offices and both governmental and non-governmental agencies/organizations dedicated to agriculture. It is intended to support a wide range of end users, including policymakers, land-use planners, land management practitioners, investors, farmers, pastoralists, Indigenous Peoples and civil society organizations. The guidance is also intended to be relevant for Parties to the other Rio conventions and for coordination mechanisms across those conventions.

## A. Agricultural lands as a strategic priority

7. Degradation of agricultural lands and soils is already widespread and undermines the productive capacity of agrifood systems, the provision of ecosystem services and the resilience of rural livelihoods. Agricultural lands are often the locus of intensive management and high pressure on land, soil and water resources, and continued degradation in these areas is likely to compromise efforts to ensure food security and nutrition, reduce poverty and achieve LDN.

8. Recent FAO assessments indicate that more than 60 per cent of global human-induced land degradation takes place on agricultural lands, with marked regional differences in extent and severity.[3] At the same time, projections indicate that agriculture will need to produce substantially more food by 2050, even as climate change, water stress and other environmental constraints intensify, reinforcing the need to conserve and restore the productive and ecological functions of agricultural lands.[4,5] Land degradation, particularly of croplands, contributes substantially to global yield gaps and threatens future production.[6] Moreover, smallholder farmers feel more insecure about their rights to the land they farm than ever before: the share of adults who feel likely or very likely to lose some or all of their land or housing increased from 19 per cent in 2020 to 23 per cent in 2024, representing about 1.1 billion people.[7]

9. At the same time, avoiding, reducing and reversing degradation of agricultural lands and soils can generate substantial social and economic co-benefits for rural communities when measures are linked to viable value chains, appropriate incentives and inclusive governance. These co-benefits include more stable and diversified incomes for farmers and pastoralists, improved resilience of smallholder production systems, reduced vulnerability to climate and market shocks and more opportunities for youth and women in land-based livelihoods.

10. Avoiding, reducing and reversing degradation of agricultural lands and soils should therefore be treated as a strategic pillar of efforts to achieve LDN and related goals in food security and nutrition, climate change, biodiversity and sustainable development. Giving greater visibility and priority to agricultural lands within restoration and land management agendas can help align investments, policies and practices with the multiple benefits that sustainable agricultural landscapes can deliver.

## B. Integrated responses to interconnected challenges

11. Decision 19/COP.16 emphasizes the need for guidance that links land and soil degradation of agricultural lands with integrated water resources management, sustainable and diverse cropping systems and crops, food security and nutrition, climate change, biodiversity loss, environmental degradation and inclusive land governance. The guidance reflects this integrated framing by connecting the dynamics of degradation on agricultural lands with wider social, economic and ecological processes across landscapes.

[3] See https://doi.org/10.4060/cd7488en.
[4] See https://doi.org/10.1038/s43016-021-00322-9.
[5] See https://www.ipcc.ch/srccl/chapter/chapter-5/.
[6] See https://www.fao.org/family-farming/detail/en/c/1749879/.
[7] See https://openknowledge.fao.org/handle/20.500.14283/cd8473en.

12. The guidance promotes an integrated response that combines LDN concepts and indicators, integrated land use planning and sustainable land use systems with sustainable land and water management and integrated, diversified and resilient production systems. It promotes support from an enabling environment that encompasses governance, tenure, policy coherence, markets and value chains, science, innovation, data and finance. By situating agricultural lands within broader landscape and policy systems and explicitly linking field practices and value chains to planning processes, the guidance seeks to support coherent action that can simultaneously reduce degradation, strengthen resilience and deliver co-benefits across climate, biodiversity and development objectives.

13. The guidance also responds to the need for policy and planning approaches that consider not only current patterns of land degradation and agricultural production, but also likely future changes in climate, water availability, land suitability and production conditions. In this way, the guidance supports the use of forward-looking analysis to help Parties identify how agricultural realities may evolve over time, including where shifts in crop choice, production systems, land and water management practices, infrastructure and value chains may be needed to sustain productivity, resilience, food security and nutrition under changing conditions.

## C. A practical and modernized guidance package

14. The guidance is part of a broader package that is designed to respond to Parties' needs for both conceptual orientation and practical support. The main body of the guidance sets out principles, concepts and recommendations for avoiding, reducing and reversing degradation of agricultural lands and soils, while a separate compilation of activities translates these into a structured menu of indicative activities, frameworks, approaches, tools and practices organized by implementation stages/levels and thematic clusters.

15. The guidance and its companion compilation of activities recognize that relevant technical guidance is widely distributed across numerous organizations, platforms and knowledge products and that these materials are continually evolving, with important gaps in coverage for some themes, user groups and regions. A static document alone cannot capture the full range of validated resources or systematically highlight areas where guidance remains limited; the combined use of a structured guidance document, a curated compilation of activities and tools and a dedicated digital landing page are intended both to organize what is currently available and to make gaps more visible so that they can inform future work, partnerships and investments.

## D. Structure and development of the guidance

16. The main body of the guidance (part I) is organized around three functional domains, preceded by cross-cutting principles and followed by reflections on constraints, gaps and the way forward. The domains are:

(a) Integrated land use planning and sustainable land use systems for LDN, with specific attention to LDN assessment, planning and monitoring in agricultural lands;

(b) Integrated, diversified and resilient production systems and sustainable land and water management across croplands, grasslands, pasturelands, rangelands and supporting ecosystems, such as forests and wetlands within agricultural landscapes; and

(c) The enabling environment, encompassing governance, tenure, integrated land, soil and water governance, institutional capacity development, policy coherence, markets and value chains, science, innovation, data, and investment and finance.

17. The companion compilation of activities (provided in the part II of the guidance) mirrors these domains through three levels: integrated land use planning and sustainable land use systems for LDN (Level 1), integrated, diversified and resilient production systems (Level 2) and the enabling environment (Level 3). Within each level, thematic clusters corresponding to the subsections of the guidance function as modular entry points and bring together related activities, prerequisite considerations, suggested next steps, and selected

frameworks, approaches, tools, innovations, and practices for different users and scales. Each activity typically references multiple frameworks/approaches/tools. This structure is summarized in the table below.

18. Part II of the guidance is being expanded through inputs received during the external scientific reviews of the guidance. At the time this document was prepared, part II of the guidance already contained dozens of activities across each of the 12 clusters.

Table 1
**Illustrative structure of levels and clusters used in the guidance**

| Level | Focus | Thematic clusters |
|---|---|---|
| **Level 1** | Integrated land use planning and sustainable land use systems for land degradation neutrality | Assessment; implementation from planning to practice; monitoring and adapting |
| **Level 2** | Integrated, diversified and resilient production systems | Croplands; grazing lands; supporting ecosystems; integrated sustainable land and water management dimensions across production systems |
| **Level 3** | Enabling environment | Policy coherence; markets and value chains; integrated governance of soil, land and water; resource mobilization and investment; science and innovation |

19. The guidance and its companion compilation were developed through an inclusive and systematic process that drew on reports of the Science-Policy Interface, background documents of the FAO Committee on Agriculture, global and regional assessments, and relevant technical guidance produced by the UNCCD, FAO and other partners. In addition to consolidating existing frameworks, approaches and tools, the process sought to identify themes, user needs and geographic contexts for which few suitable resources currently exist, so that these gaps can be signalled to Parties and partners and can guide future development of guidance, tools and investment.

## E. A living digital companion for sustained guidance

20. To ensure that the guidance remains living, adaptive and responsive to emerging knowledge and user needs, FAO and the secretariat are complementing it with a dedicated landing page on the Agrifood Systems Technologies and Innovations Outlook Knowledge Base (ATIO KB). This landing page is designed to provide Parties and other users with a digital companion to the guidance and its compilation of activities, building on existing data and knowledge partnerships and on ongoing work to strengthen digital access to agrifood systems technologies, innovations and guidance resources.

21. The landing page mirrors the structure of the compilation of activities contained in part II of the guidance by organizing content into three levels and associated clusters and presenting activities, frameworks, approaches, tools and practices as an artificial intelligence-enabled, searchable thematic catalogue. Users can navigate by level and cluster, filter content according to user profile, scale of action, type of intervention and, where possible, thematic interest, and access linked resources hosted by partner platforms and knowledge systems.

22. The artificial intelligence (AI) landscape spans a continuum from general purpose foundation models (e.g. large language models) to domain-specific AI systems, like the ATIO KB. The general purpose foundation AI models are designed to perform a wide range of tasks across domains, whereas domain-specific systems are trained or configured to operate within a defined thematic and data scope. The ATIO KB represents a domain-specific AI system which leverages curated, validated and often proprietary datasets and platforms from partner organizations (e.g. the World Overview of Conservation Approaches and

Technologies) to deliver contextually relevant and authoritative outputs. Its architecture prioritizes retrieval from these trusted knowledge sources (i.e. a retrieval-augmented approach), thereby enhancing reliability and traceability of responses. Expanding the system's scope to include validated guidance (in addition to technologies and innovations) further strengthens its role as a specialized decision-support tool grounded in vetted institutional knowledge that can enhance the utility of the guidance and its relevance into the future.

23. By leveraging curated and validated datasets and knowledge products and allowing for progressive enrichment through new evidence, tools, case studies and partnerships, the ATIO KB is expected to support more systematic, accessible and up-to-date guidance for policy design, planning and field implementation. Over time, this living knowledge base can help address gaps inherent in static compilations, including by better reflecting locally embedded, traditional and grassroots knowledge and facilitating more consistent and traceable use of evidence across sectors and scales.

24. The ATIO KB could be further supported with tools capable of providing on-demand site-specific data to support investments in agricultural lands made available in more easily accessible forms. Two examples of this address different dimensions of the challenge: (1) the Resilient Agriculture Investment for net-Zero land degradation (RAIZ) mapping tool; and (2) the integrated investment targeting tool for land restoration and drought resilience.

25. The RAIZ accelerator is a global initiative launched at the thirtieth session of the United Nations Framework Convention on Climate Change to unlock, map, and scale investments for worldwide farmland restoration. RAIZ includes a geospatial data platform for land restoration, which was developed by the Group of 20 Global Land Initiative Coordination Office of the UNCCD with technical support from FAO, the Food and Land Use Coalition, and the Alliance of Bioversity International and the International Center for Tropical Agriculture (part of the CGIAR System Organization). The RAIZ mapping tools aim to provide essential data to a wide range of stakeholders, including investors, policymakers, non-governmental organizations, project developers, and other entities across agrifood value chains, helping them to swiftly and accurately identify areas with the greatest potential for productive restoration.

26. An integrated investment targeting tool for land restoration and drought resilience is being developed by FAO as a mechanism to combine data-driven mapping with investment planning to combat land degradation and enhance resilience. It is being designed to help governments and investors identify, prioritize and fund projects that restore land, improve water management and boost community resilience. This integrated geospatial decision-support platform builds on and connects existing datasets and tools through an AI-assisted interface that exposes only the information relevant to each user's specific context and objectives. The tool provides decision-makers at the farm, landscape, regional and national scales with a single user-friendly platform to identify, prioritize and plan land-based investments based on evidence-grounded return on investment, considering financial, environmental and social benefits.

# III. Conclusions

**27. The guidance on avoiding, reducing and reversing the degradation of agricultural lands and soils confirms that (i) safeguarding and restoring the productive and ecological functions of agricultural lands is indispensable for achieving LDN, resilient agrifood systems and food security and nutrition objectives, and the delivery of ecosystem services; and (ii) effective responses require integrated planning, coherent implementation and enabling conditions.**

**28. Having considered the guidance and its companion compilation of activities and the associated digital landing page, the CST may wish to consider the following conclusions, with the aim of making recommendations to the COP.**

## A. Conclusion 1 on the strategic importance of agricultural lands

**29. Degradation of agricultural lands and soils should be treated as a strategic priority within LDN and land restoration agendas because it directly undermines food security and nutrition, livelihoods, productive capacity and ecosystem resilience at scale. Given projected increases in food demand and the growing pressures on land, soil and water resources associated with climate change and other drivers, avoiding further degradation and accelerating restoration of agricultural lands is essential for sustaining agrifood systems and for reducing pressures to convert natural ecosystems.**

**30. Efforts to restore and manage agricultural lands sustainably should complement, and not compete with, restoration efforts focused on other ecosystems, recognizing that sustainable agricultural landscapes and conserved natural ecosystems are mutually reinforcing components of resilient territories. Integrating agricultural lands (including cropland and rangelands) more explicitly into restoration strategies can help align interventions with local needs and capacities and support more inclusive, equitable and effective responses.**

## B. Conclusion 2 on applying the land degradation neutrality response hierarchy

**31. Effective responses to the degradation of agricultural lands and soils should apply the LDN response hierarchy. This prioritizes the avoidance of degradation, followed by the reduction of ongoing degradation and, where necessary, the reversal of past degradation through restoration and rehabilitation. Overreliance on restoration to compensate for ongoing degradation should be avoided, particularly in fragile and highly stressed systems where recovery may be slow, costly, uncertain or incomplete. The application of the response hierarchy up until now has been focused primarily on the national scale. However, the concepts of optimizing land use and the management approach to local conditions are equally applicable at the landscape, pasture or farm scales, where differences in microclimate and soils should be considered carefully.**

**32. Applying this hierarchy requires strengthening the assessment, planning and monitoring of agricultural lands, including clearly identifying degradation hotspots and drivers, appropriate zoning and regulation, and the adoption of sustainable land, soil and water management practices tailored to distinct agricultural land types and national circumstances. The response hierarchy also calls for the deliberate targeting of preventive measures in areas at risk of degradation and for restoration and rehabilitation efforts that are designed and implemented in ways that are socially inclusive, economically viable and ecologically sound.**

## C. Conclusion 3 on integrated planning, sustainable land and water management, and resilient production systems

**33. Integrated land use planning, sustainable land use systems, sustainable land and water management and integrated, diversified and resilient production systems provide a coherent planning and implementation architecture for avoiding, reducing and reversing degradation of agricultural lands and soils. Embedding LDN assessment, planning and monitoring in integrated land use planning processes and linking these processes to sustainable land management options and sustainable and inclusive value chains can support more informed decisions on land allocation, management options and trade-offs across agricultural landscapes.**

**34. Integrated and diversified production systems, including agroecological approaches, agroforestry, integrated crop-livestock systems and context-specific soil and water management practices can enhance soil health, water regulation, biodiversity, resilience and productivity while reducing the risk of environmental and social harms and supporting more stable livelihoods. Combining such systems with enabling market**

**conditions and value chain development can help translate sustainable production practices into durable economic opportunities and broader adoption at scale.**

## D. Conclusion 4 on enabling conditions for implementation

**35. Sustained progress in avoiding, reducing and reversing degradation of agricultural lands and soils depends on an enabling environment that encompasses secure and equitable tenure, inclusive and responsible governance, coherent and mutually reinforcing policies, institutional capacity development, functioning markets and value chains, science, innovation and data, and adequate and accessible finance and investment. Without such conditions, technically sound measures are less likely to be adopted, scaled or sustained, particularly by small-scale producers, pastoralists, women, youth and other vulnerable groups.**

**36. In many contexts, such enabling conditions also determine whether farmers, pastoralists, Indigenous Peoples and local communities can participate in and benefit from emerging income-generating opportunities that could underwrite sustainable land and water management investments or the costs of land restoration. These opportunities would require guidance in, among other things, establishing sustainable value chains, establishing ecologically sound uses of renewable energy, and pursuing circular and bioeconomy approaches and high-integrity, land-based carbon. Putting people at the centre of these enabling conditions may therefore entail, where appropriate, measures such as tailored advisory and extension services, accessible and affordable finance for smallholders and community-based initiatives, transparent and equitable benefit-sharing arrangements, support for producer organizations and cooperatives, and investments in infrastructure and services that reduce post-harvest food loss and waste.**

**37. Strengthening enabling conditions calls for measures to recognize and protect legitimate tenure rights, enhance participation of land users and communities in decision-making, improve policy coherence across sectors, mobilize and align public and private finance, support innovation and knowledge exchange and develop monitoring and data systems that can inform planning and track progress. Efforts to improve enabling conditions should be grounded in equity and inclusion and should recognize and value the contributions of Indigenous Peoples, local communities and other land users to the sustainable management of agricultural lands.**

**38. The private sector is a key enabler of sustainable land management practices at the farm and landscape level, through, inter alia, the creation of sustainable input and offtake markets and the sharing of transition costs and risks with farmers. Many enabling conditions that support farmers and local communities also leverage private sector contributions to the sustainable management of agricultural lands, if they are responsive to private sector activities, business models and investment practices. Further information on enablers for private sector contributions is available in document ICCD/COP(17)/4 and its annex.**

## E. Conclusion 5 on community well-being and livelihoods

**39. Measures to avoid, reduce and reverse the degradation of agricultural lands and soils are more likely to be effective and sustained when they also strengthen the well-being and economic security of local communities, farmers and herders. In line with article 2 of the Convention and decision 19/COP.16, Parties may therefore wish, where appropriate, to design and implement such measures in ways that improve living conditions at the community level, including by fostering secure and equitable access to land and related resources, supporting sustainable and diversified value chains, reducing food loss and waste, enabling income-generating solutions and facilitating fair access to finance and markets for smallholders and other land users.**

## F. Conclusion 6 on forward-looking planning for future agricultural realities

**40. Responses to degradation of agricultural lands and soils should be informed not only by present conditions but also by forward-looking analysis of how climate, water availability, land suitability and agrifood systems may change over time. Planning that considers future production realities can help Parties anticipate where different crops, production systems, soil management practices, infrastructure and market arrangements may be needed to maintain productivity, resilience, food security and nutrition under changing environmental and socioeconomic conditions.**

**41. Such forward-looking approaches can strengthen the relevance and durability of land use decisions by helping countries identify longer-term adaptation pathways, reduce the risk of maladaptation and better align present investment with future agricultural needs and conditions. They are particularly important where climate change, water stress, soil constraints and evolving market or demographic conditions may require significant adjustments in what is produced, where it is produced and how production systems are supported.**

## G. Conclusion 7 on living knowledge systems for Parties

**42. The combination of the guidance, the curated compilation of activities and tools and the dedicated landing page on the ATIO KB offers a more modern and flexible model of guidance support for Parties than a stand-alone technical document. By organizing validated frameworks, approaches, tools and practices into structured levels and clusters and by providing a digital entry point that can be expanded and updated over time, this package can help Parties and other users to access, navigate and apply relevant knowledge more efficiently while also revealing remaining gaps. An additional advantage of integrating the guidance into a domain-specific AI system, which leverages curated, validated, and often proprietary datasets from partner organizations, is that it allows the delivery of contextually relevant and authoritative outputs in a responsive way no matter what the background or experience level may be of the end user.**

**43. If maintained through continued curation, partnerships and quality assurance, and if progressively enriched with additional knowledge resources – including those originating from grassroots organizations and locally embedded innovators and extension services, as well as spatially explicitly tools to more accurately and accessibly communicate the potential return on investment in land restoration – this living knowledge system can enhance the long-term usefulness, inclusiveness and responsiveness of guidance on agricultural land and soil degradation. It can also help reduce fragmentation in knowledge access and support more consistent and traceable use of evidence across planning, implementation and reporting processes.**

**44. Parties may wish to consider these conclusions when engaging in consultations on a draft decision to be considered by the COP based on the draft text for negotiations that can be found in document ICCD/COP(17)/CST/8, which, following decisions 22/COP.16 and 36/COP.16, contains all draft decisions prepared for Parties for consideration at the seventeenth session of the CST.**