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SUB-COMMITTEE ON LIVESTOCK

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Forest and agriculture linkages: A path towards integrating forests, trees and livestock in dryland silvopastoral systems

Executive Summary

Drylands represent a unique area of the complex agriculture–forest nexus, in which silvopastoralism is an important land management approach that unites livestock, grasslands, shrublands and trees within an integrated agricultural system. It is based on deep traditional knowledge held by Indigenous Peoples, local pastoral and forest-dependent communities. Alongside scientific knowledge, collaboration and knowledge sharing, it can be an important instrument for optimizing the sustainable use of natural resources.

FAO has collected case studies in which silvopastoralism has successfully been used as a key instrument for improving the production, economics, nutrition and livelihoods of dryland communities. The publication *Grazing with trees – A silvopastoral approach to managing and restoring drylands*¹ describes numerous country examples where silvopastoralism has provided multiple benefits such as improved production, nutrition and livelihoods of dryland communities, while contributing to ecosystem health, restoration and other services including climate change adaptation and resilience.

Based on the findings of the publication, this document provides an overview of these multiple benefits and presents recommendations for enhancing the interconnection of sustainable agriculture and forest management through silvopastoralism. It also proposes measures to revive and improve silvopastoral systems and maximize their contributions to the SDGs and global initiatives, including the United Nations Decade on Ecosystem Restoration.²

¹ FAO. 2022. *Grazing with trees – A silvopastoral approach to managing and restoring drylands*. FAO Forestry Paper No. 187. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2280en>

² <https://www.decadeonrestoration.org/>

Suggested action by the Sub-Committee

The Sub-Committee is invited to recommend COAG to:

- encourage Members to improve cross-sectoral coordination on forests, rangelands, food production, land use, and rural development policies and strategies for more sustainable management of drylands and agrosilvopastoral systems;
- encourage Members to improve the resilience of silvopastoral systems to drought and enhance ecosystem restoration efforts in drylands, including through securing tenure rights and strengthening knowledge management and exchange; and
- invite FAO to prepare an assessment on the inclusion of silvopastoral systems in land-use and rural development policies and regulations for better drought management, and to provide support to countries, upon request, in strengthening sustainable management, restoration and monitoring of silvopastoral systems, forests and rangelands.

Queries on the substantive content of the document may be addressed to:

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I. Introduction

1. Agriculture and forestry are the largest land-use categories at the global level, covering over 80 percent of the land surface. Traditionally, agriculture has required an increasing amount of land, leading to alarming rates of deforestation. However, through deliberate efforts in both agriculture and forestry, this trend started to change in the early 2000s. As indicated in the *State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities* (pp. 54–55), it is possible to increase food production, food security and forest cover³ while achieving SDG 2 (Zero Hunger) and SDG 15 (Life on Land), as well as Global Forest Goals 1 and 2.⁴

2. Following the recommendation by the FAO Council at its 165th Session,⁵ the Committee on Agriculture (COAG) and the Committee on Forestry (COFO) strengthened their collaboration with the aim of showcasing and promoting complementary practices in forestry and agriculture. Recognizing that effective use of “data and evidence is necessary to inform decisions and catalyse support for an inclusive

³ FAO. 2016. *State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/i5588e>

⁴ Global Forest Goal 1 is to "Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change". Global Forest Goal 2 is to "Enhance forest-based economic, social and environmental benefits, including the livelihoods of forest-dependent people". See: UN Department of Economic and Social Affairs. 2019. Global Forest Goals and Targets of the UN Strategic Plan for Forests 2030. <https://www.un.org/esa/forests/wp-content/uploads/2019/04/Global-Forest-Goals-booklet-Apr-2019.pdf>

⁵ CL 165/REP, para 22 b) <https://openknowledge.fao.org/handle/20.500.14283/nc381en>

and equitable transformation of the agriculture and forest sectors”,⁶ COAG at its 28th Session and COFO at its 26th Session recommended that FAO enhance collaboration between the two sectors, including through “collecting and analysing necessary science- and evidence-based data on agriculture and forestry interdependencies, including on the direct and underlying drivers of deforestation and land degradation, by further enhancing consistency between agricultural and forest data sets, and compiling case studies and good practices.”⁷

3. In line with this, the technical report *Grazing with trees – A silvopastoral approach to managing and restoring drylands*,⁸ produced jointly by the FAO Forestry Division and the FAO Animal Production and Health Division, presented good practices and evidence on the benefits of optimized livestock grazing through silvopastoralism in restoring, conserving and managing dryland forests and silvopastoral systems. The findings of this technical report also contribute to FAO’s biennial theme for 2024–25 “Water resources management for the four betters: better production, better nutrition, a better environment and a better life, to achieve the 2030 Agenda for Sustainable Development.”⁹

4. The FAO Council at its 171st Session¹⁰ endorsed the above recommendations from COAG 28 and COFO 26 and requested that FAO scale up its related activities in the relevant Programme Priority Areas of its Strategic Framework 2022–31. In response to this guidance, COAG bureau and COFO steering committee jointly drafted an intersessional roadmap towards the next sessions of COFO and COAG in 2024.

5. As an important step of this roadmap, the COFO Working Group on Dryland Forests and Agrosilvopastoral Systems (the COFO Working Group), at its 3rd Session in 2023, invited FAO to “support countries in strengthening their forest and rangeland monitoring systems to measure silvopastoral, social, economic and environmental values in response to accelerating the achievement of the SDGs as well as other pledges, such as the UN Decade on Ecosystem Restoration and the Kunming-Montreal Global Biodiversity Framework.”¹¹

6. At this same Session, the COFO Working Group also recommended to continue the facilitation of technical collaboration, including with bodies such as the COAG Sub-Committee on Livestock, to enhance coordinated responses to Members’ needs for an integrated dryland management approach.¹² In collaboration with the Near East Forestry and Range Commission, the COFO Working Group also underscored the “need to achieve better synergies between forest and agriculture in drylands through intersectoral approaches, for more sustainable agrifood systems.”¹³

7. FAO is progressing on mainstreaming pastoralism and rangelands in its work and is supporting the development and implementation of tools, guidelines and generating knowledge on pastoralism and rangelands.¹⁴ In 2022, the importance of rangelands was elevated to global prominence when the United Nations General Assembly (UNGA) called upon FAO to facilitate the implementation of the International

⁶ COFO/2022/4, para 11 <https://openknowledge.fao.org/handle/20.500.14283/nj906en> and COAG/2022/4, para 11 <https://openknowledge.fao.org/handle/20.500.14283/nj003en>

⁷ C 2023/22, para 18 b) <https://openknowledge.fao.org/handle/20.500.14283/nj925en> and COFO/2022/REP, para 17 c) <https://openknowledge.fao.org/handle/20.500.14283/nk728en>

⁸ FAO. 2022. *Grazing with trees - A silvopastoral approach to managing and restoring drylands*. FAO Forestry Paper, No. 187. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2280en>

⁹ C 2023/REP, para 52 <https://openknowledge.fao.org/handle/20.500.14283/nm800en>

¹⁰ CL 171/REP, para 24 a) and b) <https://openknowledge.fao.org/handle/20.500.14283/nl148en>

¹¹ COFO/WG-DF/2023/REP, para 24 <https://openknowledge.fao.org/handle/20.500.14283/cc8197en>

¹² COFO/WG-DF/2023/REP, para 18 <https://openknowledge.fao.org/handle/20.500.14283/cc8197en>

¹³ COFO/WG-DF/2023/REP, para 26 <https://openknowledge.fao.org/handle/20.500.14283/cc8197en>

¹⁴ COAG:LI/2024/INF/7, <https://www.fao.org/coag/sub-committee-on-livestock/second-session/en/>

Year of Rangelands and Pastoralists (IYRP)¹⁵ in 2026. Accordingly, the COFO at its 26th Session in 2022 encouraged the COFO Working Group to support the IYRP by mobilizing its cross-regional expertise,¹⁶ which has resulted in a number of initiatives, including the first Drylands Summer School, held on 12–15 September 2023.¹⁷

II. The role of silvopastoralism in integrated dryland management

8. Sustainable management of dryland forests and trees in the face of a changing climate offers a gateway to sustainable development. Drylands host 27 percent of the world's forests and woodlands¹⁸ and an estimated half of the world's livestock.¹⁹ Livestock production systems are the main socioeconomic activity of many rural people in dryland areas, with more than 200 million people raising livestock in pastoral and agropastoral systems globally.²⁰

9. However, approximately 6 percent of the world's drylands underwent desertification between 1982 and 2015.²¹ This was largely driven by unsustainable land-use practices, including overgrazing, which was intensified further by climate change. Agricultural and forestry policies are now evolving to recognize the vital role of pastoralism in enhancing rural livelihoods and food security. This shift involves a departure from exclusive afforestation approaches, embracing mixed strategies that encompass controlled grazing – within and outside forests – to ensure sustainable use and management of natural resources while contributing to food security and income generation.

10. Within this context, silvopastoralism emerges as a key solution, uniting livestock and trees within an integrated agricultural system. Indigenous Peoples and local communities hold deep knowledge, skills and strategies that have ensured the survival and adaptation of silvopastoralism since prehistoric times. The potential to expand silvopastoralism through informed policymaking and participatory governance frameworks is vast. This approach holds the power to restore degraded forests and pastoral lands, diminish the environmental impact of livestock and optimize the sustainable use of natural resources. These practices are indispensable in enhancing both the production and sustainability of drylands on a global scale, while simultaneously offering a vital source of income to local communities.

11. Silvopastoral communities often bear the brunt of the impacts of climate change, which exacerbates other risk factors including food insecurity, armed conflict, migration and environmental degradation. Trees and forests help strengthen the resilience of communities in this context: they are a source of fibre, fuel, food and fodder, and provide valuable ecosystem services including shade, soil and

¹⁵ <https://iyrp.info/>

¹⁶ COFO/2022/REP, para 26 e) ii. <https://openknowledge.fao.org/handle/20.500.14283/nk728en>

¹⁷ <https://www.fao.org/dryland-forestry/working-group/cofo-wg-summer-school/en/>

¹⁸ FAO. 2019. *Trees, forests and land use in drylands: the first global assessment – Full report*. FAO Forestry Paper No. 184. Rome. <https://openknowledge.fao.org/handle/20.500.14283/ca7148en>

¹⁹ United Nations Convention to Combat Desertification. 2017. *The Global Land Outlook*, first edition. Bonn. https://www.unccd.int/sites/default/files/documents/2017-09/GLO_Full_Report_low_res.pdf

²⁰ COAG/2020/19, para 2 <https://openknowledge.fao.org/handle/20.500.14283/nd394en>

²¹ Intergovernmental Panel on Climate Change (IPCC) (2023) *Deserts, Semiarid Areas and Desertification*, in *Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*.

https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_CCP3.pdf

water conservation.²² For example, leaves and fruits from woody vegetation in the Ferlo region in Senegal are crucial as fodder for livestock.²³

12. Silvopastoral systems provide people, including the rural poor, with additional cash from tree products.²⁴ Wild harvested forest foods, including wild meat, add to the food security and nutrition of forest-adjacent people, including pastoralists.²⁵ Therefore, the sustainable use of forests is an essential part of sustainable agrifood systems for pastoral communities.

13. Overgrazing is a main cause of forest land degradation. Therefore, a key challenge is reconciling the grazing needs of livestock with the conservation of trees and forests in dryland areas. Silvopastoralism offers a solution, but despite its benefits, it is still a low investment priority for most dryland regions. Although many countries have enabling policies that can support the implementation of silvopastoral systems, they are often implemented poorly or not at all.²⁶

14. The FAO report *World Livestock: Transforming the livestock sector through the Sustainable Development Goals*²⁷ showed that converting other ecosystems, especially forests, to produce fodder will have serious repercussions for people and the environment. However, the rehabilitation of degraded lands and the expansion of agroforestry, alongside better grazing management, can boost agricultural productivity, increasing usable surfaces by another billion hectares in the future.²⁸

15. The following sections present country examples and experiences in enhancing silvopastoralism for integrated dryland management and improving livelihoods, economics and nutrition.

A. Silvopastoralism is a multifunctional management approach for improving the production, economics, nutrition and livelihoods of dryland communities

16. Silvopastoral systems are multifunctional and incorporate varying production cycles that stabilize production throughout the seasons and ensure long-term sustainability for silvopastoral producers. The production of non-wood forest products in silvopastoral systems, livestock and plants plays a crucial role in increasing resilience through supporting livelihoods, food security and nutrition during harsh conditions.

²² FAO. 2022. *The State of the World's Forests 2022. Forest pathways for green recovery and building inclusive, resilient and sustainable economies*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cb9360en>

²³ Dendoncker, M., Ngom, D., & Vincke, C. 2015. Tree dynamics (1955-2012) and their uses in Senegal's Ferlo region: Insights from a historical vegetation database, local knowledge and field inventories. *Bois et Forêts des Tropiques*, 6(326): 25–41. <https://doi.org/10.19182/bft2015.326.a31281>

²⁴ Razafindratsima, O.H., Kamoto, J.F.M., Sills, E.O., Mutta, D.N., Song, C., Kabwe, G., Castle, S.E. *et al.* 2021. Reviewing the evidence on the roles of forests and tree-based systems in poverty dynamics. *Forest Policy and Economics*, 131: 102576. <https://doi.org/10.1016/j.forpol.2021.102576>

²⁵ FAO. 2022. *Forest-based adaptation: transformational adaptation through forests and trees*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2886en>

²⁶ FAO. 2021. *Building climate-resilient dryland forests and agrosilvopastoral production systems: An approach for context-dependent economic, social and environmentally sustainable transformations*. Forestry Working Paper No. 22. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cb3803en>

²⁷ FAO. 2018. *World Livestock: Transforming the livestock sector through the Sustainable Development Goals*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/ca1201en>

²⁸ HLPE. 2019. *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security*. HLPE Report #14. Rome. <https://openknowledge.fao.org/handle/20.500.14283/ca5602en>

17. Silvopastoralism can improve the quality and variety of local diets through terrestrial animal source food.²⁹ An FAO study in Argentina, Chad and Mongolia demonstrated the multifaceted contribution of livestock grazing to socioeconomic well-being in woodlands and grasslands, especially in remote areas. Livestock and livestock products, including living animals, meat, milk and hides, represented between 37 and 74 percent of direct sales income.³⁰ When self-consumption is added, the total contribution of grazing livestock could account for much more than 75 percent of total income. Similarly, in the Caatinga region of Brazil, *fundos de pasto* (pasture farm) communities have thrived for centuries by combining communal livestock husbandry with tree products. Communities gather fruits like umbu, licuri, passion fruit and araticum, while wood is sustainably extracted for construction purposes.³¹

B. Silvopastoralism contributes to ecosystem health, restoration and services provision

18. Silvopastoralism contributes to ecosystem health in multiple ways. The combination of different land uses, including the stratified layers of vegetation and grazing livestock under various management systems, creates a variety of microclimatic niches and spatial heterogeneity, which boost biodiversity.³²

19. In Australia, research concluded that the economic potential of implementing silvopastoral systems in private native spotted gum regrowth forests was substantially higher than that of reclearing it for cattle production.³³ In Nigeria, an analysis of four different grazing-based livestock systems, from extensive to semi-intensive, concluded that 48 percent of them used fodder from trees and shrubs during the dry season, and 91 percent did so during the rainy season.³⁴

20. In Latin America, pasture-based cattle farms increased their forage production by over 175 percent and their milk production per hectare by over 75 percent after introducing trees into the local pastoral system.³⁵ In India, the Jhansi dryland areas have increased their production tenfold using a ten-year silvopastoral rotation plan.³⁶

21. Integrating forests and rangelands under sound grazing management plans can support drought management. In Uzbekistan, water management strategies in the field include increasing retention and water harvesting; building wells; and planting fodder crops around wells to reduce pressure on local

²⁹ FAO. 2023. *Contribution of terrestrial animal source food to healthy diets for improved nutrition and health outcomes*. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc3912en>

³⁰ Wane, A., Cesaro, J.D., Duteurtre, G., Touré, I., Ndiaye, A., Alary, V., Juanès, X. et al. 2020. *The economics of pastoralism in Argentina, Chad and Mongolia: Market participation and multiple livelihood strategies in a shock-prone environment*. FAO Animal Production and Health Papers No. 182. Rome, FAO and CIRAD. <https://openknowledge.fao.org/handle/20.500.14283/cb1271en>

³¹ Bech Gaivizzo, L.H., Litre, G., Lopes Ferreira, J., Gomes Pereira da Silva, R., Nogueira Soares, D., Moraes Reis, R., Almeida, A.C. et al. 2019. Resilience to climate change in Fundo de Pasto Communities in the semiarid region of Bahia State, Brazil *Sociedade & Natureza*, 31, 1–22. <https://seer.ufu.br/index.php/sociedadennatureza/article/view/46331>

³² FAO. 2022. *Grazing with trees - A silvopastoral approach to managing and restoring drylands*. FAO Forestry Paper No. 187. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2280en>

³³ Francis, B., Venn, T., Lewis, T. & Brawner, J. 2022. Case studies of the financial performance of silvopastoral systems in Southern Queensland, Australia. *Forests*, 13(2): 186. <https://doi.org/10.3390/f13020186>

³⁴ Jamala, G.Y., Oke, D.O. & Fajemisin, A.N. (2016). Traditional silvopastoral systems and farmers' indigenous knowledge of fodder trees and shrubs in Southern Guinea Savanna, Adamawa State, Nigeria. *Forests and Forest Products Journal*, 9(2006), 93–102.

³⁵ Chará, J., Rivera, J., Barahona, R., Murgueitio R., E., Deblitz, C., Reyes, E., Mauricio, R.M. et al. 2017. Intensive silvopastoral systems: Economics and contribution to climate change mitigation and public policies. In: F. Montagnini, eds. *Integrating landscapes: Agroforestry for biodiversity conservation and food sovereignty*. pp. 395–416. Advances in Agroforestry, vol. 12. Springer, Cham International Publishing. https://doi.org/10.1007/978-3-319-69371-2_16

³⁶ Yadav, A., Gendley, M., Sahu, J., Kumar, P.P., Chandraker, K., & Dubey, A. 2019. Silvopastoral system: A prototype of livestock agroforestry. *The Pharma Innovation Journal*, 8(2), 76–82. <https://www.thepharmajournal.com/archives/2019/vol8issue2/PartB/8-1-94-847.pdf>

rangelands. In the area, leaves from trees and shrubs complement animal feed during drought periods, mobilizing alternative feed sources from crop residues.³⁷ In Kenya, a forest-based grazing management plan was introduced to restore degraded lands and establish watering points in the Great Rift Valley's northern region. This approach promoted natural regeneration, tree planting and fodder management. It also boosted beef and milk production, while enabling local communities to engage in businesses like seedling production, herbal medicine collection and beekeeping.³⁸

C. Silvopastoralism contributes to climate change adaptation and resilience

22. While people living in dryland forests and rangelands usually graze their livestock in these areas legitimately, pastoralist activities have traditionally been viewed as a challenge to restoration. Now agricultural and forestry policies are increasingly considering the importance of pastoralism in improving rural livelihoods and bolstering food security, shifting from pure reforestation and afforestation approaches towards mixed approaches that include grazing inside and outside forests. Countries like Lebanon, Morocco and United Republic of Tanzania have already updated their national forest and rangeland laws and policies to account for these mixed approaches.³⁹

23. Silvopastoralism can also directly support climate change mitigation. FAO's Ex-Ante Carbon-balance Tool (EX-ACT)⁴⁰ was used to estimate the per hectare carbon emissions associated with converting pasture, forest and native Cerrado land in Brazil to soy, and to compare the carbon emissions from 2021 to 2050 under business-as-usual and land degradation neutrality scenarios. In the Cerrado, the study showed that while expanding soy production over native Cerrado vegetation generates each year an additional 433.8 tonnes of CO₂-equivalents (tCO₂-e) per hectare, integrating soy production into existing pastureland through silvopastoralism would generate annually only 11.7 tCO₂-e per hectare, making pastureland the best scenario.⁴¹

24. In Morocco, a successful large-scale forest restoration initiative with climate adaptation and mitigation benefits has been implemented, offering local grazing associations compensation for protecting areas by closing them to grazing while grazing and resting periods were secured for the rest of the land. In 2019, there were more than 175 associations with approximately 101 000 hectares of restored dryland. The commitment and support received from the grazing associations has been linked to the reforestation success rates with associated climate benefits.⁴²

III. Towards more efficient silvopastoral systems

25. Experiences and lessons so far show considerable potential in silvopastoral systems as a means of integrated land management that serves multiple environmental, economic and social objectives. However, fully unlocking this potential requires cross-sectoral approaches and close coordination and collaboration at all levels, from policies to action on the ground. Improving the governance and

³⁷ FAO. 2022. *Grazing with trees - A silvopastoral approach to managing and restoring drylands*. FAO Forestry Paper No. 187. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2280en>

³⁸ FAO. 2022. *Grazing with trees - A silvopastoral approach to managing and restoring drylands*. FAO Forestry Paper No. 187. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2280en>

³⁹ See the publications of Agence Nationale des Eaux et Forêts, Morocco at <http://www.eauxetforets.gov.ma/Pages/Publications.aspx>

⁴⁰ <https://www.fao.org/in-action/epic/ex-act-tool/suite-of-tools/ex-act/en/>

⁴¹ FAO. 2022. *Valuing, restoring and managing "presumed drylands": Cerrado, Miombo-Mopane woodlands and the Qinghai-Tibetan Plateau*. Forestry Working Paper No. 30. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc0110en>

⁴² Moukrim, S., Lahssini, S., Naggar, M., Lahlaoui, H., Rifai, N., Labbaci, A., Arahou, M. & Rhazi, L. 2019. Compensation pour mises en défens forestières et réhabilitation des écosystèmes par l'implication de la population. *Alternatives Rurales*, (7), 156–171.

management of land use and land-use change involves taking a series of decisive and concrete measures. These include:

- **Participatory processes that enable sound development, implementation and monitoring of legal and regulatory tools and planning instruments related to sustainable land use.** These include the development of participatory management planning, taking into consideration the multifunctionality of silvopastoral management systems and addressing issues related to access to land, including tenure and water rights, types of land use, pasture management, controlling livestock diseases, and promoting the organization of local associations.
- **Improving knowledge of silvopastoralism supported by sound data.** Following the guidance of the 28th Session of COAG and the 26th Session of COFO, a special study by the FAO Global Forest Resources Assessment (FRA),⁴³ expected in 2025, aims to strengthen existing assessments on agroforestry, including silvopastoralism, at national, regional and global levels. The study also represents an opportunity to consolidate and complement agroforestry data already collected by FAO, including the FRA of trees outside forests⁴⁴ and the FAO Corporate Statistical Database (FAOSTAT), allowing for the inclusion of socioeconomic data.
- **Utilizing technology and innovation for restoration monitoring.** If deployed effectively across critical landscapes, monitoring and information systems can be crucial for improving ecosystem health and achieving land degradation neutrality. Examples of available tools include the Global Livestock Environmental Assessment Model (GLEAM),⁴⁵ the Framework for Ecosystem Restoration Monitoring (FERM),⁴⁶ the System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL),⁴⁷ Collect Earth⁴⁸ and Earth Map,⁴⁹ and FAO's FRA.⁵⁰
- **Supporting land management through reviving traditional silvopastoral systems.** Supporting or re-enabling land management through securing traditional pastoral systems has proven to be an effective approach to rangeland restoration. Examples of traditional rangeland management systems where land and key resources are regulated by local communities have shown to be effective tools for rangeland restoration.⁵¹
- **Strengthening land tenure rights.** Often, silvopastoral management occurs in areas where land tenure is insecure. Silvopastoral management requires clarity on grazing rights and rights to plant trees on land, to be able to incentivize investing and work on adaptation through land improvement. Regulations governing land tenure need to secure and balance rights to access and use forests and grazing areas under clear, fair and transparent rules. Moreover, applying the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in

⁴³ <https://www.fao.org/forest-resources-assessment/en/>

⁴⁴ Foresta, H. de, Somarriba, E., Temu, A., Boulanger, D., Feuilly, H., & Gauthier, M. 2013. *Towards the assessment of trees outside forests*. Forest Resources Assessment Working Paper 183. Rome. <https://openknowledge.fao.org/handle/20.500.14283/aq071e>

⁴⁵ <https://www.fao.org/gleam/en/>

⁴⁶ <https://ferm.fao.org/>

⁴⁷ <https://www.fao.org/in-action/sepal/overview/sepal-a-powerful-open-source-platform-for-forest-and-land-monitoring/en>

⁴⁸ <https://openforis.org/tools/collect-earth/>

⁴⁹ <https://earthmap.org/login>

⁵⁰ <https://www.fao.org/forest-resources-assessment/en/>

⁵¹ FAO. 2022. *Grazing with trees - A silvopastoral approach to managing and restoring drylands*. FAO Forestry Paper No. 187. Rome. <https://openknowledge.fao.org/handle/20.500.14283/cc2280en>

the Context of National Food Security⁵² will strengthen equitable and inclusive gender-sensitive planning and land tenure rights.

- **Strengthening knowledge management and exchange.** The implementation and maintenance of sustainable silvopastoral systems require continuous development of their knowledge base. This includes strengthening traditional and scientific knowledge through South-South and triangular cooperation as well as through international fora. It also includes: country-validated national data sets prepared for land degradation monitoring and reporting in the context of the United Nations Convention to Combat Desertification national reporting process; SDG Indicator 15.3.1 reporting; the annual greenhouse gas inventory submission to the United Nations Framework Convention on Climate Change; national reporting to biodiversity-related international commitments; reporting on progress towards the Global Forest Goals;⁵³ and taking advantage of the awareness-raising activities and knowledge sharing events organized under the United Nations Decade on Ecosystem Restoration.

⁵² <https://openknowledge.fao.org/handle/20.500.14283/i2801e>

⁵³ UN Department of Economic and Social Affairs. 2021. *The Global Forest Goals Report 2021*. <https://doi.org/10.18356/9789214030515>