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FAO REGIONAL CONFERENCE FOR LATIN AMERICA AND THE CARIBBEAN

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Addressing the challenges of the water-forests-biodiversity-soil nexus in a climate change context

Executive Summary

Latin America and the Caribbean, a rich and diverse region, stands as a strategic ally in the global provision of food thanks to its abundant productive resources. However, global changes, including economic and population growth, climate change and environmental degradation, are increasing pressure on ecosystems and natural resources such as land, soil, water, forests and biodiversity, threatening their capacity to sustain the provision of ecosystem services.

To support the 2030 Agenda for Sustainable Development, the Sustainable Development Goals (SDGs) and adapt to climate change, it is crucial to acknowledge ecosystem services' importance to production systems. Understanding the interdependence of natural resources and socioeconomic drivers of degradation is essential to address the multiple and complex challenges that productive systems are facing. In this regard, Integrated Landscape Management (ILM), Integrated Land Use Planning (ILUP), and Integrated Land and Water Management (ILWM) provide suitable frameworks to manage natural resources, offering the opportunity to maximize long-term multiple benefits, considering trade-offs and complementarities of interventions over the resources involved.

In the region, FAO can support countries to utilize the ILM, ILUP and ILWM approaches to take advantage of win-win solutions and manage trade-offs related to the nexus between land, soil, water, forest and biodiversity and foster *better production, better nutrition,* a *better environment* and a *better life* for all.

Suggested actions by the Regional Conference

The Regional Conference is invited to:

(a) reaffirm that, in order to achieve the 2030 Agenda for Sustainable Development and its Sustainable Development Goals under FAO's stewardship, it is fundamental and urgent to use integrated approaches to natural resources management, in which the nexus between land, soil, water, forest and biodiversity is recognized;

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(b) provide guidance on priorities for FAO's technical support for:

(i) the adoption, dissemination, and scale-up of good, holistic and innovative approaches and practices that recognize the vital links between natural resources and their role in sustaining production systems;

(ii) strengthening governance and development of policies, programmes, regulations and institutional frameworks in order to establish an enabling environment for: 1) the adoption of sustainable and integrated natural resources management; 2) strengthening land, water and other natural resources tenure; and 3) access to data and information systems on natural resources management for adequate, timely and informed decision-making; and

(iii) promoting regional and international cooperation, knowledge sharing and resource mobilization efforts for sustainable and integrated resources management.

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I. INTRODUCTION

1. This document presents the case to consider the nexus between land, soil, water, forests and biodiversity, in FAO's work in Latin America and the Caribbean region (LAC), through the use of different approaches. For this, it first highlights the importance of considering the inter-linkages between land, soil, water, forests and biodiversity for the management of natural resources. It then briefly describes proposed approaches as frameworks to ponder nexus considerations when managing complex environmental systems. The final sections describe how nexus considerations among land, soil, water, forests and biodiversity through integrated approaches could be incorporated in the Organization's work to better support its Members.

II. LAND, SOIL, WATER, FOREST AND BIODIVERSITY MULTIPLE LINKAGES

2. Latin America and the Caribbean, a rich and diverse region, stands as a strategic ally in the global provision of food thanks to its abundant productive resources. However, global changes, including economic and population growth, climate change and environmental degradation, are increasing pressure on natural resources such as land, soil, water, forests and biodiversity and threaten their capacity to provide ecosystem services.[1]

3. The region has an immense natural capital with 46 percent of the world's tropical forests, nearly 60 percent of the planet's terrestrial biodiversity,[2] 23 percent of cultivable land and a third of the total freshwater available.[3] However, these resources are facing, for different reasons, a strong pressure and their ecosystem equilibrium is at stake. For example, forest cover has decreased more than 13 percent

[1]Durango, S., Sierra, L., Quintero, M., Sachet, E., Paz, P., Da Silva, M., Valencia, J. & Le Croq, J.F. 2019. *2030 - Alimentación, agricultura y desarrollo rural en América Latina y el Caribe - Documento Nº9 - Estado y perspectivas de los recursos naturales y los ecosistemas en América Latina y el Caribe (ALC)*. FAO. In: https://www.fao.org/documents/card/en?details=ca5507es%2f

[2]UNEP-WCMC. 2016. *The state of biodiversity in Latin America and the Caribbean: A mid-term review of progress towards the Aichi Biodiversity Targets.* Nairobi (Kenya), United Nations Environment Programme (UNEP). In: https://www.cbd.int/gbo/gbo4/outlook-grulac-en.pdf

[3] FAO. 2022. *The State of the World's Land and Water Resources for Food and Agriculture 2021 – Systems at breaking point*. FAO. In: https://doi.org/10.4060/cb9910en

in the last three decades,[4] and it is estimated that approximately 50 percent of productive soils of the region are being affected by high level of erosion primarily due to unsustainable management and loss of vegetation cover.[5] Agricultural practices, such as overuse of agrochemicals and antibiotics, as well as inappropriate use of plastics, are contaminating water and soils and threatening biodiversity, putting at stake the environment's capacity to provide environmental services.

4. The degradation of productive resources is also driven by climate change, which, in turn, is accelerated by greenhouse gases (GHG) emissions. Just over a quarter of total regional GHG emissions originate from agriculture.[6] Additionally, due to climate change, an increase in the frequency of extreme weather events is expected, which calls for urgent preparedness of agricultural systems with further efforts towards adaptation and building their resilience.

5. Also, it is forecasted that agriculture will need to produce in 2050 almost 50 percent more food, feed and biofuel than it did in 2012.

6. Understanding the interdependence of natural resources and the services they provide to productive systems is essential to address the multiple and complex challenges that those systems are facing.

7. For example, forests provide ecosystem-based solutions related to water availability and quality, reducing the negative consequences of extreme weather events and unsustainable management practices. They influence water availability by regulating river flows and promoting aquifer recharge, and by decreasing erosion, impacting water quality and land degradation. Furthermore, forests influence cloud formation through evapotranspiration, thereby influencing the climate.[7] Forest health is intrinsically dependent on biodiversity, which in turn, through pollinators, plays an essential role in agriculture and food security.

8. Soils provide fundamental ecosystem services, biodiversity and fertility, regulation of the water cycle, and food safety, quality and nutritional value. They are the largest water filter on earth, cleaning tens of thousands of cubic kilometres of water each year; they contain more carbon than all the vegetation on the planet and host a tremendous diversity of organisms crucial for multiple environmental processes.[8]

9. One key contribution of the nexus between soils and biodiversity lies in nutrient cycling and soil fertility maintenance. Soil organisms, including bacteria and fungi, play a vital role in decomposing organic matter and releasing nutrients that are crucial for plant growth. This intricate web of interactions supports the overall health and productivity of terrestrial ecosystems.

10. Soil organic matter, with its carbon content, is a strategic element for adapting to climate change and mitigating its effects, providing benefits for the current and future population.[9] LAC soils have the highest carbon sequestration potential in the world; they could increase their carbon sequestration mitigating between 12 and 48 percent of the total regional net GHG[10].

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[4]Branthomme, A., Merle, C., Kindgard, A., Lourenço, A., Ng, W.-T., D'Annunzio, R. & Shapiro, A. 2023. *How much do large-scale and small-scale farming contribute to global deforestation?* FAO.
In: https://doi.org/10.4060/cc5723en

[5]Santibañez, 2007.
In: https://www.researchgate.net/publication/227236633_Trends_in_Land_Degradation_in_Latin_America_and_the_Caribbean_the_Role_of_Climate_Change

[6]World Bank Group, 2022. *A roadmap for climate action in Latin America and the Caribbean 2021-2025.* Washington, D.C. In: https://openknowledge.worldbank.org/server/api/core/bitstreams/d3e9d5ba-bdea-543b-8e51-e53f39308a73/content

[7] FAO 2020. *The State of the World's Forests 2020, Forests, biodiversity and people*.
In: https://www.fao.org/publications/card/en/c/CA8642EN/

[8] FAO. 2015. *Soils and biodiversity. Soils host a quarter of our planet's biodiversity.*
In: https://www.fao.org/documents/card/en/c/43b565e7-57c2-43c6-b4f0-812091486ed3/

[9] FAO. 2017. *Soil Organic Carbon: The hidden potential*. In: https://www.fao.org/3/i6937e/i6937e.pdf

[10] OECD-FAO. 2023. OECD-FAO *Agricultural Outlook 2023-2032*. In: https://doi.org/10.1787/08801ab7-en

11. Therefore, it is crucial to consider the interdependence between land, soil, water, forest and biodiversity to find solutions to local problems to support the 2030 Agenda for Sustainable Development, leaving no one behind. In this regard, Integrated Landscape Management (ILM), Integrated Land and Water Management and Integrated Land Use Planning (ILUP), approaches provide suitable frameworks, offering the opportunity to maximize long-term multiple benefits, considering trade-offs and complementarities of interventions over the resources involved.

III. FAO TECHNICAL APPROACHES

12. The intricate and ample set of issues affecting land, soil, water, forests and biodiversity, and their nexus, requires flexible, broad and integrative approaches. Problems are diverse and specific, and there is no one size fits all solution. Integrated Landscape Management, Integrated Land Use Management and Integrated Land and Water Management are approaches used by FAO that offer frameworks to foster win-win solutions related to the planning, management and use of natural resources; their use will depend on specific circumstances.

13. All these approaches can help countries find solutions that support the implementation of national policies and sustainable development in line with the 2030 Agenda for Sustainable Development, the United Nations Framework Convention on Climate Change , the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, the Convention on Biological Diversity, the Kunming-Montreal Global Biodiversity Framework, the United Nations Convention to Combat Desertification, the conventions on persistent chemicals, and the Convention on Wetlands.

Integrated Landscape Management

14. The Integrated Landscape Management approach deals with large-scale processes in an integrated and multidisciplinary manner, combining natural resource management with environmental and livelihood considerations. The landscape approach also factors in human activities and their institutions, viewing them as an integral part of the system rather than as external agents. This approach recognizes that the root causes of problems may not be site-specific and that a development agenda requires multistakeholder interventions to negotiate and implement actions.[11]

15. Integrated Landscape Management is gaining increasing importance in the context of projects and programmes aimed at overseeing intricate human-environment interactions. It encompasses a spectrum of interventions, ranging from the micro catchment scale primarily overseen by communities and local stakeholders to broader development initiatives involving multiple sectors and stakeholders concerned with both productive and non-productive land uses. ILM facilitates the integrated management of natural resources on a comprehensive scale, with the goal of optimizing ecosystem functions and services. Additionally, ILM addresses the intricate interactions within landscapes, such as those between upstream and downstream areas and the terrestrial, aquatic and atmospheric components.

16. ILM approaches usually follow ten principles adopted by the Convention on Biological Diversity: Continuous learning and adaptation; Common concern entry point; Multiple scales; Multifunctionality; Multiple stakeholders; Negotiated and transparent change logic; Clarification of rights and responsibilities: Participatory and user-friendly monitoring; Resilience; and Strengthened stakeholder capacity.[12]

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[11]FAO. Integrated Landscape Management. https://www.fao.org/land-water/overview/integrated-landscape-management/en/

[12] Sayer et al. 2013. *Ten principles for a landscape approach to reconciling agriculture, conservation, and other competing land uses.* PNAS 110, 21.

Integrated Land Use Planning

17. The Integrated Land Use Planning assesses and assigns the use of resources, taking into account different uses, and demands from different users, including all agricultural sectors – pastoral, crop and forests – as well as industry and other interested parties.[13]

18. ILUP assists with inter-sectoral planning processes and implementation for the sustainable use of land resources. It provides guidance to assess several baseline aspects, including the suitability of agricultural production systems, and the examination of soil and land degradation and socioeconomic factors affecting decision-making on land-use and natural resources management in agricultural landscapes. It also aims to assist with developing country-specific recommendations for the implementation of an agreed intersectoral plan.

19. FAO is in the process of updating the Guidelines for Integrated Land Use Planning. Among the new features of the revised guidelines are: a) moving from top-down land use planning to integrated and participatory land use planning; b) integrating international commitments and Rio Conventions into the national, subnational and local planning processes; c) promoting people-centred planning process, realizing the key role of "land users" and communities affected by planning; d) addressing key issues in land use planning, such as climate change, restoration of degraded land, land degradation neutrality and biodiversity maintenance, water management, peri-urban and urban agriculture, tenure and land rights of women and Indigenous Peoples, mainstreaming, upscaling and outscaling good practices.

Integrated Land and Water Management

20. The 174th Session of the FAO Council endorsed the *FAO's Conceptual framework on integrated land and water resources management*, which highlights the fundamental role of land and water to achieve the Sustainable Development Goals (SDGs). It provides policy guidance and technical assistance to Member countries and support strategic interventions and innovations on efficient and sustainable use of land, soil and water resources.[14]

21. The approach identifies five outcomes: (a) good governance: effective and inclusive land, soil, and water governance solutions are developed and applied at all levels (local, national, regional and global); (b) conservation, restoration and sustainable use of land, soil, and water resources; (c) increased adaptation and resilience to climate change and reduced greenhouse gas emissions; (d) integrated land-soil-water solutions: the transition to sustainable agrifood systems is advanced through developing, promoting and applying integrated land-soil-water solutions that address human-environment interactions and the rural-urban interface; and (e) optimized land-soil-water data and information systems for agrifood systems transformation**.**

IV. PRIORITY AREAS OF INTERVENTION

22. In the region, FAO can support countries to utilize diverse integrated resource management approaches to take advantage of win-win solutions related to the nexus between land, soil, water, forest and biodiversity and foster *better production, better nutrition,* a *better environment,* and a *better life,* leaving no one behind. Specifically, FAO can support countries in the following ways:

[13] FAO. 2020. *Framework for integrated land use planning - An innovative approach*.
In: https://www.fao.org/documents/card/en?details=CB1170EN
[14] FAO. 2023. *FAO's Conceptual framework for integrated land and water resources management.* 137th Session of the Programme Committee. Rome, 6-10 November 2023.
In: https://www.fao.org/3/nn077%20en/nn077%20en.pdf

Regional Priority 1:
Efficient, inclusive and sustainable production

Programme priority area	Main actions
BP1: Innovation for sustainable agriculture production	a. Knowledge generation and sharing to promote an integrated approach for natural resources management, including information for evidence-based decision making and capacity building. b. Promote and enhance soil and forest ecosystem services to improve water quality and availability as a tool against the effects of variable weather conditions over agriculture. c. Enhance capacities to apply agroforestry and other restoration practices in line with the United Nations Decade on Ecosystem Restoration.
BP4: Small-scale producers´ equitable access to resources	a. Promote governance and ownership of land, water and natural resources by less advantaged groups (women, youth and Indigenous People) and acknowledge their crucial role in protecting and managing natural resources.

Regional Priority 3:
Sustainable management of natural resources and adaptation to climate change

Programme priority area	Main actions
BE1: Climate change mitigating and adapted agrifood systems	a. Promote REDD++ projects as ecosystem-based solutions to mitigate GHG emissions and positively influence the water cycle. b. Integrate the links between water and land/soil management as tools to reduce GHG emissions. c. Support the inclusion of the Agriculture, Forestry, and Other Land Use (AFOLU) sector, with emphasis in soil and water, as key actor to achieve international agreements related to climate change. d. Foster integrated good practices such as promoting and scaling up drought-resilient, nutritious and indigenous crops and soil recarbonization.
BE3: Biodiversity and ecosystem services for food and agriculture	a. Support countries to implement ecosystem-based solutions to enhance ecosystem services, with an emphasis on pollinators. b. Promote ecosystems restoration to increase biodiversity, with a focus on restoration of agricultural land. c. Enhance countries' capacities and knowledge to incorporate in their programme and policies, Integrated Landscape Management, Integrated Land Use Planning and Integrated Land and Water Management when relevant, fostering considerations on win-win solutions related to land, soil, water, forest and biodiversity. This includes knowledge generation to support decision-making. d. Enhance countries' capacities and knowledge in monitoring land, soil, water, forest, biodiversity and ecosystem services to support informed decision-making. e. Foster regional knowledge sharing related to ecosystems' restoration, including the support of international platforms such a RedParques, the LAC Regional Expert Group on Forest Fires , Invasive Species Specialist Group, among others. f. Support high-level dialogue to implement the United Nations Decade of Ecosystems Restoration action plans.

	g. Incorporate in the urban landscape ecosystem-based solutions related to tree management, to enhance water quality and quantity and non-conventional water use for plantation.

V. CONCLUSIONS AND RECOMMENDATIONS

23. Ecosystem services are crucial to production systems. Recognizing the interdependence of natural resources and socioeconomic drivers of degradation is essential to address the multiple and complex challenges that production systems are facing. It is necessary to implement integrated approaches to provide suitable frameworks to manage natural resources, offering the opportunity to maximize long-term multiple benefits, considering trade-offs and complementarities of interventions over the resources involved. To achieve this overarching goal, FAO proposes the following recommendations:

(a) Reaffirm that, in order to achieve the SDGs of the 2030 Agenda for Sustainable Development under FAO stewardship, it is fundamental and urgent to use integrated approaches to natural resources management, in which the nexus between land, soil, water, forest and biodiversity is recognized.

(b) Recognize the important contributions that ecosystem services make to agricultural production and the fundamental role that land, soil, water, forest and biodiversity play in sustaining these ecosystem services.

(c) Ensure the safeguarding of ecosystem services to improve the quality and availability of water resources, for agriculture production, to preserve livelihoods, diversify sustainable development opportunities, enhance the well-being of the rural population and reduce regional socio-environmental conflicts.

(d) Recognize that the management of natural and productive resources presents multiple, complex and specific challenges, and that sustainable and integrated natural resources management approaches offer appropriate principles of action to address them. Social, cultural, economic and environmental aspects and their interactions should be considered, recognizing the important role played by all actors in society, including women, Indigenous Peoples, Afro-descendants, youth and the elderly.

In this regard, it is important to:

(i) promote the health of soils and biodiversity, as well as the sustainable management of water resources and the care of forests in agrifood systems, in the face of growing pressure on resources and the climate crisis, by adopting holistic and innovative approaches that recognize the indissoluble links between productive resources and enhancing environmental, economic and social synergies, in order to ensure the recognition and safeguarding of the ecosystem services provided by natural resources;

(ii) support the strengthening of governance and development of policies, programmes, regulations and institutional frameworks in order to establish an enabling environment for the adoption of sustainable and interconnected resources management, through measures such as linking agricultural and environmental policies and legal provisions, intersectoral cooperation and understanding of the context of vulnerable groups;

(iii) guide concrete actions to facilitate the adoption, dissemination and scale-up of good practices for sustainable and integrated natural resources management approaches, at policy and programme level, as a mechanism to support the 2030 Agenda for Sustainable Development and address regional priorities;

(iv) promote international cooperation, including knowledge sharing and collaboration at regional level, with the objective of facilitating, where appropriate, technical cooperation, capacity building, knowledge sharing, technology and innovation transfer and the formation of strategic alliances, to promote sustainable resources management at the local, national and regional levels;

(v) strengthen frameworks on land, water and other natural resources tenure;

(vi) create, strengthen, update and promote access to data and information systems on natural resources management for adequate, timely and informed decision making; and

(vii) increase resource mobilization towards the incorporation of integrated natural resources management approaches and principles, and enhance ecosystem services to achieve more efficient, inclusive, resilient and sustainable agrifood systems.