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Forestry and Fishery Linkages: Restoring Mangroves for Coastal Livelihoods

The Commission is invited to:

- Consider how RECOFI can play a role to identify the value that mangroves can play to better inform fisheries management at the regional level
- **Consider how fisheries management at the regional level can better support mangrove restoration projects**
- Consider requesting FAO to establish a regional programme to restore mangroves, strengthen fisheries and support coastal livelihoods through sustainable, community-led initiatives. This should include targeted training and support for women- and youth-led enterprises, engagement with women's organizations, and involvement of youth organizations in mangrove restoration, fisheries governance, and climate-smart coastal livelihoods.

Introduction

1. This document, jointly prepared by the Near East Forestry and Range Commission (NEFRC) *NEFRC/2025/6* and the Regional Commission for Fisheries (RECOFI) *RECOFI/XIII/2025/11*, explores the linkages between forestry and fisheries. It highlights shared challenges such as resource degradation and climate pressures, while identifying opportunities for integrated solutions. It emphasizes the importance of cross-sectoral collaboration and the need to scale up innovative approaches to sustainably transform agrifood systems.

2. Future climate projections for the Arabian Peninsula highlight rising temperatures, decreasing precipitation, increased coastal erosion and rising sea levels, all attributed to anthropogenic climate change. These trends exacerbate heat stress and aridity, directly threatening mangrove ecosystems that depend on and benefit from stable coastal conditions and freshwater inflow. Sea-level rise can inundate mangroves, while higher temperatures and prolonged drought may limit their growth and

survival. Such impacts will weaken mangroves' role in coastal protection, carbon storage, and marine biodiversity.[1]

3. At its 164th and 165th Sessions, the FAO Council requested FAO "to showcase and promote existing and complementary practices between agriculture activities and the conservation, restoration and sustainable use of forests, avoiding deforestation and maintaining ecosystem services, noting that agriculture and forestry can synergistically support sustainable development". Additionally, the FAO 177th Council Session highlighted agroecology and other innovative approaches as an important approach to achieving sustainable, inclusive and resilient food systems.[2]

4. FAO's 2023 report on The World's Mangroves 2000–2020[3] recorded 14.8 million hectares globally in 2020, with 677 000 hectares lost over two decades. More than 20 percent of mangroves have disappeared in 40 years, largely due to aquaculture, land-use change, and climate-driven retraction.

5. In the Near East region, mangroves are present but limited in distribution compared to tropical regions like Southeast Asia. However, their ecological and socio-economic value is significant, especially in the Red Sea, Arabian Gulf, and parts of the southern Mediterranean.[4] Rising sea levels, more frequent cyclones, and altered freshwater flows are threatening these ecosystems, which are crucial for biodiversity conservation and coastal resilience. For instance, Oman's mangroves, covering approximately 1000 ha[5], have been impacted by urbanization and human activities such as fuelwood harvesting and grazing of livestock, compounding the challenges posed by climate change.

6. Mangroves in the RECOFI, primarily *Avicennia marina* and *Rhizophora mucronata*, are uniquely adapted to withstand extreme heat and harsh coastal conditions.[6] They provide vital ecological, economic, and cultural benefits for the region. These include coastal protection, fisheries support, carbon storage, and ecotourism potential, while serving as key feeding grounds for migratory birds along the Eurasia-Africa flyway.[7]

7. Fisheries production in the RECOFI region reached approximately 1.7 million tonnes in 2021, with the Islamic Republic of Iran (I.R.) and Oman accounting for 39 percent and 53 percent of total production, respectively. Beyond production, fisheries represent an important livelihood for coastal communities in the RECOFI region, as well as a major source of protein. The sector faces a number of challenges related to overfishing, climate change impacts and coastal development, and Member countries are working to ensure its long-term sustainability for the livelihoods of the thousands involved in this activity.

8. While RECOFI works to adopt an Ecosystem Approach to Fisheries (EAF) and Aquaculture (EAA), the specific role of mangroves has not been discussed at the Commission level. This document aims to initiate that discussion, recognizing that mangroves serve as critical habitats for fishery resources, functioning as nurseries, feeding grounds, and reproduction areas, this joint work forms an important topic of discussion. The document will be presented at the Working Group of Fisheries Management (WGFM) and then for consideration at RECOFI's upcoming 13th Session which will be hosted by Sultanate of Oman from 15-18 September 2025.

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[1] IPCC Working Group I Interactive Atlas: Regional synthesis
[2] CL 177/9 - Report of the 140th Session of the Programme Committee (Rome, 10-14 March 2025)
[3] https://doi.org/10.4060/cc7044en
[4] Leal, Maricé and Spalding, Mark D 2024. The State of the World's Mangroves 2024. Global Mangrove Alliance. DOI: https://doi.org/10.5479/10088/119867
[5] Mangrove project to reduce 14m tonnes of CO2 emissions - Oman Observer
[6] Rondon, M.; Ewane, E.B.; Abdullah, M.M.; Watt, M.S.; Blanton, A.; Abulibdeh, A.; Burt, J.A.; Rogers, K.; Ali, T.; Reef, R.; et al. Remote Sensing-Based Assessment of Mangrove Ecosystems in the Gulf Cooperation Council Countries: A Systematic Review. *Front. Mar. Sci.* **2023**, *10*, 1241928.
[7] Campbell, O. An Introduction to the Birds of the United Arab Emirates. In *A Natural History of the Emirates*; Burt, J.A., Ed.; Springer Nature: Cham, Switzerland, 2024; pp. 469–505.

I. Mangroves contribution to the food security of coastal communities

9. Studies in the Gulf region highlight the significant carbon storage potential of mangroves, with carbon stocks ranging from 81 to 276 Mg C/ha, depending on the location.[8] While carbon sequestration rates in dryland mangroves are lower than in wetter regions, these ecosystems still play a crucial role in global climate change mitigation.[9]

10. Mangrove restoration offers a wide range of local, national, and regional benefits, including protection against stronger storms, salinization, and coastal erosion, as well as supporting fisheries, food security, and livelihoods. Moreover, mangrove ecosystems provide co-benefits for climate resilience and contribute to tourism. These studies emphasize the urgent need for mangrove restoration as a powerful strategy for both climate adaptation and mitigation.

11. FAO is implementing mangrove and food security initiatives that offer valuable lessons for Near East countries to adopt collaborative, ecosystem-based approaches. Programmes like The Restoration Initiative (TRI)[10] highlight the power of cross-country collaboration to scale up forest and landscape restoration. For example, Guinea-Bissau shared its mangrove restoration experience with Sao Tome and Principe, while in the Western Indian Ocean, FAO-led efforts have restored degraded mangroves through coastal community engagement.[11]

12. As part of the UN Decade on Ecosystem Restoration (2021-2030),[12] mangroves have become a symbol of nature-based solutions (NBS) to global environmental challenges. Their restoration supports the Decade's objectives of halting biodiversity loss, combating desertification, and mitigating climate change. Gulf countries are at the forefront of these efforts, demonstrating a strong commitment to protecting and restoring mangrove habitats. The Abu Dhabi Mangrove Initiative focuses on restoring vital coastal ecosystems, including mangroves, seagrass beds, and coral reefs, to safeguard biodiversity, enhance climate resilience, and sustainably manage the region’s natural resources. This flagship programme highlights the United Arab Emirates’ commitment to ecosystem restoration and sustainable coastal management.[13]

13. Fisheries management in the RECOFI region occurs at both national and regional levels, with RECOFI playing a critical role in managing shared resources in a semi-enclosed basin. As a regional fisheries management organization (RFMO), RECOFI is mandated to make binding measures to ensure the sustainability of fisheries.

14. Regional actions to date include a binding measure on assessing and managing the stock of Kingfish/Narrow-barred Spanish Mackerel (*scomberomerous commerson*), a data collection measure for the RECOFI priority species, as well as efforts to consolidate national fisheries research. RECOFI also formally coordinates with the relevant conservation organization in the region, the Regional Organization for the Protection of the Marine Environment (ROPME), on issues of common mandate such as climate change.

II. Mangrove restoration and the blue economy

15. In the Gulf, mangrove restoration is becoming a key component of blue economy initiatives, with countries such as Oman, Qatar, the United Arab Emirates and Saudi Arabia investing in restoring degraded mangrove areas. These efforts are often linked to broader objectives such as enhancing

[8] Savari et al., 2020; Abdulla Naser, 2023
[9] Eid et al., 2016
[10] https://www.therestorationinitiative.org/
[11] https://www.fao.org/in-action/forest-landscape-restoration-mechanism/resources/articles/article-detail/cross-border-mangrove-restoration--a-collaborative-effort/en?utm_source=chatgpt.com
[12] https://www.decadeonrestoration.org/
[13] https://www.decadeonrestoration.org/abu-dhabi-marine-restoration

coastal resilience, supporting fisheries, improving biodiversity, and contributing to climate change mitigation. As part of their Nationally Determined Contributions (NDCs), several Gulf countries are integrating mangrove restoration into sustainable development frameworks to promote inclusive economic growth and strengthen natural resource management.

16. Under the Saudi Green Initiative, Saudi Arabia aims to plant 100 million mangrove trees by 2030. The National Center for Vegetation Cover Development and Combating Desertification (NCVC) has already planted 13 million seedlings across regions like Jazan, Madinah and Makkah. These efforts support fisheries by enhancing coastal habitats and align with broader goals of carbon sequestration and shoreline protection.[14]

17. The United Arab Emirates also plans to plant 100 million mangroves by 2030, with 27 million targeted in Abu Dhabi alone. The Environment Agency – Abu Dhabi (EAD), in collaboration with Dendra, uses drone technology for efficient planting and monitoring. Additionally, EAD has introduced national guidelines for mangrove restoration, aiming to serve as a global model for ecosystem rehabilitation.[15]

18. Bahrain's Ministry of Environment, Climate Affairs, and Urban Planning is leading a mangrove reforestation project to strengthen coastal ecosystems. In 2022, the country successfully planted 110 000 mangrove trees, achieving 100 percent of its announced target, and is now working toward meeting its 2023 goal. The project uses saplings from the Tubli nursery and emphasizes careful planning to ensure adaptation to local marine environments.[16]

19. In 2024, Qatar's Ministry of Environment and Climate Change planted 9 000 mangrove seedlings in Al Ghashamiya and Al Thakhira. Mangroves support 97 percent of Qatar’s commercial fisheries, valued at over USD 67 million.[17] The Ministry, in collaboration with ExxonMobil Research Qatar, launched a mangrove rehabilitation programme focused on site mapping, environmental assessments, and biodiversity monitoring, promoting ecosystem-based management to balance coastal development with conservation.[18]saplings planted between March 2023 and March 2024.

20. In Egypt, mangrove restoration projects along the Red Sea and Mediterranean coasts are enhancing coastal resilience, supporting fisheries, and promoting eco-tourism. The Red Sea Global project aims to plant 50 million mangrove trees by 2030, aligning with Egypt's Blue Economy strategy. Efforts around Lake Burullus are also restoring degraded coastal areas, boosting biodiversity and supporting local fisheries, contributing to Egypt's climate adaptation and sustainable resource management goals.[19]

21. Oman's Blue Carbon project, a collaboration between the Environment Authority and Marine Science and Aquaculture (MSA) Green Projects Company, aims to plant 100 million mangrove trees over four years. This initiative is projected to reduce carbon dioxide emissions by 14 million tonnes and generate approximately USD 150 million in carbon credits, supporting Oman's goal of achieving net-zero emissions by 2050.[20]

[14] Coastal mangrove-growing program in Saudi on track
[15] UAE mangrove restoration project to be global template | AGBI
[16] Bahrain's goal to increase mangrove trees discussed
[17] https://thepeninsulaqatar.com/article/11/08/2024/over-9000-mangrove-seedlings-produced-this-year-mecc
[18] Improving management of future coastal development in Qatar through ecosystem-based management approaches - ScienceDirect

[19] https://www.euronews.com/green/2022/05/02/a-mangrove-revolution-how-egypt-is-prioritising-climate-projects-in-the-run-up-to-cop27
[20] https://www.omanobserver.om/article/1144348/oman/environment/mangrove-project-to-reduce-14m-tonnes-of-co2-emissions

III. Opportunities for strengthening forestry–fishery linkages

22. Sustainable aquaculture, improved fisheries management, and ecosystem restoration are key to securing food security and resilient coastal communities across the region.[21] A comprehensive, science-based model for sustainable mangrove restoration and sustainable management in the Near East must be developed, field-tested, and scaled up through a participatory approach involving environmental authorities, fisheries agencies, and local communities.

23. Such model could be powered by artificial intelligence (AI), integrating robust data to inform decision-making, enhance climate and biodiversity outcomes, improve livelihoods, and include a monitoring system with targeted capacity building to strengthen governance and institutional frameworks.

24. Investing in nature-based solutions, including the protection, conservation, and restoration of mangroves and other blue carbon ecosystems, is vital for achieving the 1.5°C target outlined in the Paris Agreement.

25. Monitor the mangrove rehabilitation and its specific role in the behaviour of RECOFI priority species. Ensure national-level results and observations are shared and compared regionally and disseminated to relevant organizations.

26. Establish clear restoration goals, develop nursery practices, and prioritize restoration sites based on updated mapping and habitat analysis.

27. Develop a comprehensive mangrove mapping and monitoring framework, assess data availability, and implement a monitoring system. Leverage FAO's Global Forest Resources Assessment (FRA) platform and the Forest Monitoring for Forest Carbon tool to monitor restoration progress and contributions to climate change mitigation.

28. Support the development of policies that align with climate, biodiversity, and restoration goals, and implement financial mechanisms that compensate local communities with intentional inclusion of youth and women.

29. Foster collaboration through stakeholder engagement, data validation, and the creation of communities of practice. Promote long-term knowledge exchange through workshops and regional partnerships.

30. Identify and share best practices and lessons learned from mangrove restoration and related environmental initiatives. Ensure their integration into national and regional strategies, including Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), Long-term Strategies (LTS), and Biennial Transparency Reports (BTRs).

31. Develop financial compensation (offset) mechanisms for mangrove restoration and local fishing communities. Promote sustainable income opportunities by directing benefits to the local level and drawing on successful experiences from other regions.

[21] NERC/24/6