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FAO REGIONAL CONFERENCE FOR THE NEAR EAST

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Blue transformation of aquatic food systems in the NENA region

Executive Summary

Aquatic food systems are critical for food security, livelihoods and the economies of the Near East and North Africa (NENA) region countries and can help them achieve many of the 2030 Sustainable Development Goals. Trade of aquatic products is considerable both within the region and globally. Aquatic food systems in both marine and freshwater have the capacity to produce more sustainable and resilient food and support livelihoods in the region through sustainable and targeted development. FAO's Blue Transformation Roadmap 2022-2030 and its associated Programme Priority Areas provide a blueprint to guide Members to achieve sustainable, resilient and inclusive aquatic food systems within their own national economic, social and resource contexts. Blue Transformation is based on three core objectives: sustainable intensification and expansion of aquaculture; effective management of all fisheries; and updated value chains of aquatic foods.

This document summarizes FAO's Blue Transformation agenda and provides an overview of how this applies to the context of the NENA region The document identifies some capacity-building and technical-assistance areas that may be of regional priority, spanning aquaculture innovation and investment, support to improved fishery assessment for sustainable, adaptive management, strengthened support to small-scale fisheries policy and review of fishery support mechanisms and their linkage to trade. It outlines key opportunities for Members at all development states to invest in and promote Blue Transformation in their aquatic food systems to increase their contribution to aquatic food systems to provide a significantly larger proportion of nutritious food and resilient livelihoods required to meet the 2030 Agenda for Sustainable Development in the NENA region.

Suggested action by the Regional Conference

The Regional Conference is invited to provide guidance on priorities for technical assistance to support aquatic food systems through the following areas:

a) implement the objectives of the FAO Blue Transformation Roadmap 2022-2030 and ensure aquatic foods are included in the programme of work in NENA countries;
b) promote regional cooperation and management towards sustainable fisheries and the sustainable development of aquaculture; by enhancing the effectiveness of the Regional

Commission for Fisheries (RECOFI) in the Gulf and Sea of Oman and Arabian Sea, the General Fisheries Commission for the Mediterranean and the establishment of Regional Fisheries and Aquaculture bodies in the Red Sea and Gulf of Aden;

c) enhance access to blue and climate finance for resilience, innovation and transformation of aquatic food systems;

d) support regional capacity building programmes built around one or more areas of the following key pillars:

i. provide guidance on national policy direction for stimulating greater innovation and investment in aquaculture and promotion of sustainable aqua-business in response to climate risks;

ii. improve fisheries and aquaculture data collections systems, stock assessment and integrated sustainable use and conservation management tools, to support decision makers, ensuring increased public access to information;

iii. strengthen and invest in small-scale fisheries and aquaculture policies supported by national plans of action in alignment with global guidelines and instruments; and

iv. ensure that the nutritional benefits of aquatic foods are included in food security, nutrition and public health strategies and policies, and incorporated in food--based dietary guidelines as part of a food systems approach.

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I. Introduction

1. For 3.3 billion people, aquatic foods provide at least 20 percent of the average per capita intake of animal protein, providing a unique source of omega-3 fatty acids and essential micronutrients that are critical to people's cognitive and physical development. Furthermore, fish consumption has been shown to reduce blood pressure, lower cholesterol levels, and improve cardiovascular function[1]. In 2020, at the global level, around 600 million people had livelihoods that were dependent on aquatic food systems, including 58 million people working in primary production. When considering the entire value chain, approximately half of those employed are women. That same year, the first sale value of aquatic production was around USD 406 billion and world exports of aquatic products, excluding algae, were worth USD 150 billion, reaching then a new record high of USD 176 billion in 2021. Aquatic products represent one of the most traded global food commodities.

2. Aquatic food systems consisting of capture fisheries and aquaculture are crucial in the Near East and North Africa and play an important role in food security and nutrition, and livelihoods of communities.

3. Compared with almost every other animal protein, aquatic food production systems have relatively low carbon emissions[2], water consumption and environmental footprint. They also provide indirect benefits to stakeholders, such as environmental stewardship, ecosystem services and cultural identity. The magnitude of these benefits shows the opportunities provided by aquatic food systems to support the Sustainable Development Goals (SDGs).

4. Although aquatic food systems are efficient producers of nutritious food, there are issues regarding their sustainability. Pollution, overfishing and poor management of fisheries, inefficient and overcrowded aquaculture, and unequal distribution of benefits along value chains, among others, hamper the ability of aquatic food systems to maximize their contribution to sustainable development across the Near East and North Africa (NENA) region, and globally overall.

5. The Declaration for Sustainable Fisheries and Aquaculture of the FAO Committee on Fisheries (COFI)[3], adopted at the 34th Session of the COFI in 2021, fully recognized the contribution of fisheries and aquaculture to fighting poverty, hunger and malnutrition, its ability to prepare for and respond to the projected impacts of climate change, and its commitment to sustainability. Aligned with the FAO Strategic Framework 2022-31[4], the 2021 COFI Declaration for Sustainable Fisheries and Aquaculture and the goals of SDG 14, FAO developed the Blue Transformation Roadmap 2022-2030 and Programme Priority Area (PPA) to increase their contribution to healthy diets, ensuring environmental stewardship and inclusive and sustainable growth.

6. This document reviews the impact of aquatic food systems on the NENA region as well as opportunities and potential actions to deliver a Blue Transformation.

II. Blue Transformation

7. FAO estimates that by transforming global aquatic food systems, global aquatic food production could grow from 178 million tonnes in 2020 to almost 250 million tonnes per year by 2050, under a high road scenario, and consequently increased the apparent per capita consumption of aquatic foods to 25.5 kilograms per year by 2050. However, producing more aquatic food does not automatically lead to lower hunger rates, improved livelihoods or sustainable outcomes. This requires a concerted effort that considers environmental impacts as well as the social and economic viability of every element of an aquatic food system.

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[1] https://www.unnutrition.org/library/publication/role-aquatic-foods-sustainable-healthy-diets

[2] MacLeod, M.J., Hasan, M.R., Robb, D.H.F. *et al.* Quantifying greenhouse gas emissions from global aquaculture. *Sci Rep* **10**, 11679 (2020). https://doi.org/10.1038/s41598-020-68231-8

[3] FAO. 2021. *2021 COFI Declaration for Sustainable Fisheries and Aquaculture*. Rome. https://doi.org/10.4060/cb3767en

[4] FAO. 2021. *FAO's Strategic Framework 2022-2031*. Rome. https://www.fao.org/3/cb7099en/cb7099en.pdf

8. Blue Transformation[5] is a targeted effort by which agencies, governments and stakeholders can use existing and emerging knowledge, tools and practices to secure and sustainably maximize the contribution of aquatic food systems for food security, nutrition and affordable healthy diets for all. FAO Members have already highlighted the importance of Blue Transformation as FAO's vision to achieve sustainable aquatic food systems[6] through three core objectives:

a. sustainable intensification and expansion of sustainable aquaculture satisfies rising global demand for aquatic foods;
b. effective management of all fisheries and aquaculture delivers healthy stocks and production, and secures equitable livelihoods; and
c. upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

9. Blue Transformation offers a vision of how aquatic food systems can maximize their potential as drivers of employment, economic growth, social development and economic recovery, particularly in the face of conflict over resources and the projected impacts of climate change.

III. Sustainable intensification and expansion of sustainable aquaculture satisfies rising global demand for aquatic foods.

10. An ever-increasing global population and a greater understanding of the health benefits of aquatic foods means that the global demand continues to grow. Given sustainability challenges in capture fisheries, aquaculture must grow sustainably to satisfy this supply gap for aquatic foods, while generating new or securing existing sources of income and livelihood opportunities.

11. Global aquaculture production (aquatic animals and algae) has increased by 54 percent since 2011, exceeding 126 million tonnes in 2021, remaining one of the fastest growing agricultural producing sectors in the world. In the region, aquaculture also provides approximately 31 percent of all fisheries and aquaculture production of aquatic animals.

12. In NENA, aquaculture production increased by 132 percent over 20 years to reach almost 1.8 tonnes in 2021 (worth over USD 2.5 billion[7]), with Egypt alone accounting for 90 percent of the total followed by Saudi Arabia with 5.6 percent. Overall, around 87 percent of all aquatic food production in the region (fisheries and aquaculture) came from just four of the nineteen NENA countries: Egypt, Morocco, Oman and Mauritania. Many countries have ambitious growth targets as part of their food security strategies.

13. The aquaculture component of FAO's Blue Transformation Roadmap 2022-2030 envisions three key outcomes:

a. 35 percent growth in global sustainable aquaculture production by 2030;
b. growth in aquaculture employment and skilled labours improves income and livelihoods; and
c. achieve full and productive employment and decent work in the aquaculture sector for all women and men by 2030.

14. For most water-scarce NENA countries lacking surface water, options for aquaculture growth at scale to meet regional food security objectives are largely limited to expansion of near or off-shore nascent net-cage sectors and saline/brackish water ponds (e.g. for shrimp).

15. Offshore aquaculture has the potential to increase productivity, lower environmental impacts, and enhance fish health and welfare. However, it also faces technical, regulatory, economic and social (including worker welfare) constraints. Marine cage farming has shown promise in the region, though upscaling is also likely to require further movement to offshore locations with greater environmental carrying capacity (including to climate-induced, thermal and salinity stresses). This will also require

[5] FAO. 2022. *Blue Transformation - Roadmap 2022–2030: A vision for FAO's work on aquatic food systems.* Rome. https://www.fao.org/3/cc0459en/cc0459en.pdf

[6] Report of the 172nd Session of the FAO Council.

[7] Equivalent to <USD1.5/kg farm-gate; reflecting the dominant share of low value tilapias at this time point.

the transfer and adaptation of more costly cage technologies capable of reliable operation in these higher energy environments.

16. The Arabian Gulf is generally too shallow with water temperature and salinity extremes too great to support cage operations. Offshore production in deeper (>30m), cooler, well-flushed waters has been attempted in Qatar (52km offshore, 40m depth) and offers a potentially "climate-smart "solution, but it incurs higher capital and operational costs relative to inshore production. On the Arabian Sea, Oman has recently established fish cage farm on a total area of 1.5 million square meter on the Arabian Sea. Saudi Arabia also developed projects on the Red Sea aiming to reach 300 tons from sea bream and sea bass.

17. Onshore production in controlled environment, known as Recirculating Aquaculture Systems (RAS), offer potential for grow-out production in higher-income, more urbanized NENA countries. Environmentally beneficial attributes include ability to: (i) concentrate and re-use nutrient-rich wastes; (ii) locate farms in brownfield, less environmentally sensitive sites; and (iii) prevent escapes and preclude transmission of pathogens to the environment. Whilst RAS grow-out technology has matured significantly, high capital and operational costs relative to open systems, mean they are only likely to be economically viable for production of higher-value species at significant scale.

18. Higher-income Gulf States have led the region in investment in recirculating aquaculture investments. In the United Arab Emirates systems designed to produce Atlantic salmon (*S. salar*), yellowtail kingfish (*S. lalandi*), European seabass (*D. labrax*), and brown-spotted grouper (*E. cooides*) and sturgeon caviar (i.e. high value option) have been established in Saudi Arabia and the peri-urban areas of Dubai and Abu Dhabi i.e. co-located with sizable municipal markets.

19. Coastal brackish water culture in ponds, tanks or pens may present a lower investment opportunity for some countries in the region. There is limited smallholder pond production of tilapia in arid inland areas, in integrated fish farms with crop production or frequently integrated as decoupled aquaponic system in agriculture farms. In the Gulf region such production benefits from direct and indirect agricultural subsidies, effectively serving as welfare transfers to small-holder farmers. However, one company – National Aquaculture (NAQUA) – practises semi-intensive culture of shrimp in a 60-km stretches of coastal ponds on the Red Sea coast, and other projects on various scales are established in Oman.

III.1 Key needs to transform aquaculture in the NENA region include the following

20. Increase technical capacity on marine spatial planning and cage site selection and environmental data collection.

21. Support comprehensive regional adoption of spatial planning guidelines for design and management of Allocated zones for aquaculture (AZA) consistent with the ecosystem approach to aquaculture (EAA) and regulation based on environmental quality standards (EQS) to minimize adverse environmental and socioeconomic impacts and negative interactions with other resource uses.

22. Increase awareness on national aquatic animal emergency disease preparedness and response (Progressive Management Pathway for Improving Aquaculture Biosecurity [PMP/AB], antimicrobial resistance [AMR]). This is important to limit transboundary diseases (TADs), support capacity building at enterprise, national and regional scales for proactive biosecurity planning (including emergency preparedness, risk analysis, monitoring and surveillance), and design of progressive management pathways (PMP) at national levels.

23. Including "aquaculture biosecurity" as a permanent agenda item of the RECOFI working group on aquaculture (WGA) has the potential to attract capacity building support contributions from private sector and research experts. This should also support development and adoption of regional strategies for NENA countries accessing shared water resources.

24. For countries bordering the Mediterranean, implementation of the Strategy for the Sustainable Development of Mediterranean and Black Sea Aquaculture of the General Fisheries Commission for the Mediterranean.

IV. Effective management of all fisheries and aquaculture delivers healthy stocks and production, and secures equitable livelihoods.

25. FAO started publishing its regular analysis of the state of global fish stocks in 1974 and has included an updated summary analysis in its biennial FAO flagship publication *The State of World Fisheries and Aquaculture* (SOFIA) since that time. The global fisheries sector in 2022 is now appreciably different compared to that of the 1970s, as are the dominant fish stocks, their location and modes of exploitation.

26. Marine fishery landings from the NENA region reported to FAO (wild capture, and not including aquaculture) have averaged 3.8-4 million tonnes per year since the late 1990s, accounting for some 4.3 percent of the world's total marine capture fisheries production, with a declining trend.

27. The effective management of fisheries is a fundamental objective of the Blue Transformation Roadmap 2022-2030, underpinning national commitment to the SDGs and securing the livelihoods of millions of people in the NENA region. FAO's Blue Transformation Roadmap 2022-2030 establishes three key global outcomes for its fisheries component:

a. implementing effective management of all the world's fisheries;
b. phasing out all illegal, unreported and unregulated fishing activities; and
c. achieving full and productive employment and decent work in the fisheries sector for all.

28. Where sustainable fishery management is implemented, fish stocks recover, and capture fisheries provide increasingly secure social, environmental and economic benefits. However, increasing evidence of the projected impacts of climate change and other hazards on aquatic ecosystems calls for the explicit consideration of climate stressors and disaster risks in fisheries management, integrating climate change adaptation and disaster risk reduction as well as a better connection with natural resources management or development actions. For this purpose, shifting to flexible and adaptive management approaches would allow for continuous adjustments as climate impacts are detected.

29. The region is characterized by three semi-enclosed water bodies – Red Sea, Gulf of Aden, the Arabian Gulf and the Mediterranean Sea with significant proportion of shared stocks. RECOFI which includes Iraq, Bahrain, Kuwait, Qatar, Saudi Arabia, Oman and the United Arab Emirates, in addition to Iran, promotes regional cooperation on sustainable fisheries management in the Gulf, but this requires continued support and strengthening.

30. The General Fisheries Commission for the Mediterranean (GFCM) continues to support NENA countries to improve collaboration and increase sustainability of Mediterranean resources. Its 2030 Strategy for sustainable fisheries and aquaculture in the Mediterranean and the Black Sea provides a pathway for Blue Transformation in the region.

31. The Red Sea and Gulf of Aden are lacking any regional fishery and aquaculture management and cooperation instituitional arrangements at the moment. Recognizing this need, it is imperative that efforts continue to establish a regional aquaculture and fisheries management organization and to implement an Ecosystem Approach to Fisheries that is inclusive and can help Members adapt to changes in conditions for fisheries and aquaculture production. The region also requires close collaboration to assess the health of stocks.

32. A significant challenge to fisheries management is illegal unreported and unregulated fishing (IUU). Countries in the region should invest in monitoring, control and surveillance systems and contribute in capacity building, and collaborate to deter and eliminate the IUU fishing. Several countries in the region, Libya, Mauritania, Morocco, Oman and Somalia are parties to the 2009 FAO Agreement on Port State Measures (PSMA). Saudi Arabia is also in the process of accession, while Oman and Morocco are at the implementation stage and have updated their regulations.

33. Small-scale fisheries are also critical if aquatic foods are to support efforts to eliminate poverty and malnutrition in the region. Globally, small-scale fisheries (SSF) are a significant component of capture fisheries, providing an estimated 36.9 million tonnes of catch (average 2013-

2017), generating 44 percent of the total landed economic value of the catch[8] and engaging 113.0 million people along various value chains in 2016. At least half of the people employed in SSF and aquaculture along the entire value chain are women. In NENA with more than fifty thousand fishers, small-scale fisheries contribute to more than 95 percent of the total marine production from capture fisheries.

V. Upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

34. Aquatic food value chains include the full range of activities and stakeholders engaged in producing, transforming and delivering products to consumers. Upgrading to more efficient, inclusive, low emission and resilient value chains add or create greater value for aquatic foods, unlocking more wealth and food from aquatic food systems, supporting resilient livelihoods and contributing to poverty reduction. Efficient and inclusive value chains may also reduce fish loss and waste, improve access to markets, provide safer more nutritious food, improve distribution and access to aquatic foods, enhance transparency and support technological innovation in the sector.

35. FAO's Blue Transformation Roadmap 2022-2030 establishes four key global outcomes for aquatic foods value chains:

a. significantly increasing global per capita fish consumption by 2030, especially across the Global South;
b. reduction of fish loss and waste by half by 2030;
c. ensuring current and future potential exporters are able to comply fully with import market requirements of major import countries; and
d. phasing out all forms of discrimination and abuse against women along the value chain.

36. Per capita seafood consumption levels in the region are most strongly correlated with domestic production and country income levels. This results in a wide divergence in consumption levels between NENA states, coupled with high dependency on seafood imports in higher income states with the most rapid demand growth. Countries in the region should calibrate appropriate levels of self-reliance through domestic aquatic food production, with assessments of wider supply-chain resilience to ensure access to aquatic food across the entire region. Public health and nutrition outcomes should receive greater consideration in the choice of production systems, species and strains, reinforced through appropriate allocation of government incentives.

37. The total trade of aquatic products reached a new record high of USD 177 billion in 2021 after dropping consecutively in 2019 and 2020; this makes aquatic foods one of the most highly traded food products. With its extensive free-trade zones and logistics infrastructure, the United Arab Emirates are a major seafood import-export hub for the NENA region (with 133 seafood import and 102 export partners from 2019 to 2020). Liberal trade conditions are fostered by high prevailing levels of food import dependency and lucrative opportunities for value-added seafood trade. Consequently, there is little appetite for protectionist measures with Saudi Arabia and Egypt as its largest export recipients.

38. The aquaculture and capture fisheries supply chain will remain complex considering that processing can be outsourced to other countries with lower labour and production costs. Aquatic products often cross national borders numerous times before final consumption, and a major obstacle for aquatic product exports is the wide variety of inspection systems and consumer safety standards in importing countries. Many food items are rejected, detained or destroyed because exporters are not fully aware of the import controls. FAO has publicly analysed import notifications from the top importing countries since 2016 available on FishStatJ[9] and FAO GLOBEFISH[10], to improve transparency and distribute information, as well as food safety regulations.[11]

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[8] FAO, Duke University & WorldFish. 2023. Illuminating Hidden Harvests – The contributions of small-scale fisheries to sustainable development. Rome. https://www.fao.org/3/cc4576en/cc4576en.pdf
[9] https://www.fao.org/fishery/en/statistics/software/fishstatj
[10] https://www.fao.org/in-action/globefish/import-notifications/en/
[11] https://www.fao.org/in-action/globefish/countries/food-safety-regulation-for-fishery-and-aquaculture-products/en/

39. Furthermore, global agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the World Trade Organization Agreement on Fisheries Subsidies may impact aquatic food trade in the region. FAO is committed to supporting Members in evaluating the impact of these Agreements and building capacity to support their implementation.

40. To support Members' compliance with export market regulations and achieve smooth market access, FAO also provided ongoing capacity-building initiatives in food safety and quality for aquatic products. The uptake of novel technologies to improve post-harvest processes and reduce environmental impacts, as well as fish loss and waste along the value chain, and capacity-building to improve aquatic biosecurity and assess disease burden and prevent the development of antimicrobial resistance in aquatic food systems will further strengthen the environmental sustainability of production activities.

41. There is an increasing business opportunity for using by-products in aquatic food utilization, as processing fish typically generates nearly 50 percent of by-products. These can be turned into food, fish leather, silage, fishmeal, vitamins, biochemical extracts, and isinglass. In addition, there is a growing demand for foods derived from fish by-products, producing nutrient-rich and inexpensive products derived from fish parts. However, it is estimated that every year the NENA region loses more than 30 percent of its food to loss and waste approximating the global average. However, this is especially problematic in a region with ubiquitous water scarcity and high dependence on food imports. To reduce fish loss and waste, FAO has specific programmes and tools for determining the viability of alternative uses for fish waste.

42. Enhanced biosecurity and food-safety regulation support value-added regional trade. In the United Arab Emirates some 25 percent of export value from 2019 to 2022 was for re-export of non-transformed seafood. Saudi Arabia has developed and implemented a biosecurity strategy in their aquatic food system and is collaborating to expand it to the regional level, Egypt has worked closely with FAO, and prepared their national biosecurity strategy and planned to be launched and implemented in near future.

43. Countries’ commitments to the Paris Agreement (such as through their nationally determined contributions or NDCs) and articulated priorities in National Adaptation Plans (NAPs), Long-term Strategies (LTS) and other national and sectoral climate change, environment and sustainability strategies for climate-resilient, low-carbon economies, should also be taken into consideration for improving the sustainability and climate resilience of fish and aquaculture supply chains.

VI. Blue Transformation in Near East and North Africa

44. The areas identified above are typical needs and priorities for the NENA Region and are incorporated within the work of the FAO Regional Priority 3 on Greening agriculture, water scarcity and climate action while cutting across the other regional priorities. Specific solutions need to be country or sub-regionally specific programme of work to better contribute to more efficient, inclusive and resilient agrifood systems. FAO is the leading technical agency to support this need, and through the implementation of the Blue Transformation Roadmap 2022-2030, it can seek ways to support the follow actions by:

a. promoting the Blue Transformation Roadmap 2022-2030 into the programme of work in NENA countries;

b. enhancing access to blue and climate finance for resilience, innovation and transformation of aquatic food systems;

c. promoting regional cooperation and management towards sustainable fisheries and promoting sustainable development of aquaculture by enhancing the effectiveness of RECOFI in the Gulf and Sea of Oman and Arabian Sea and establishment of Regional Aquaculture and Fisheries Organization in the Red Sea and Gulf of Aden;

d. supporting regional capacity building programmes built around one or more areas of the following key pillars:

i. providing guidance on national policy direction for stimulating greater innovation and investment in aquaculture transformation and promotion of aqua-business in the context of climate change;

ii. improving fisheries and aquaculture data collections systems, stock assessment and integrated sustainable use and conservation management tools, to support decision makers, ensuring increased public access to information;

iii. strengthening and investing in SSF and aquaculture policies supported by national plans of action in alignment with the SSF Guidelines; and

iv. developing public health nutrition policies such as food-based dietary guidelines to promote the role of aquatic foods for healthy diets, and incorporating these into other systems.