SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Marine areas surrounding the Arab region are under threat from ocean warming and acidification and marine pollution from offshore and onshore development activities. A growing proportion of marine areas have reached biologically unsustainable levels of overfishing and illegal fishing. These changes threaten the health, well-being and prosperity of people across the region now and for generations to come. More informed, coherent and effective policies are needed to establish marine protected areas, and to enhance data as well as institutional and technical capacities to effectively monitor and sustainably manage marine resources and enforce associated regulations.

Key facts

27.6%

The Arab region has made some progress in establishing marine protected areas. The average proportion of marine key biodiversity areas covered by protected areas reached 27.63 per cent in 2017. This remains below the global average of 44 per cent, however, and the averages for most other regions.[1]

Rapid coastal development, the associated growing use of coastal and marine resources, and maritime trade through the Red Sea and Gulf of Aden significantly challenge the protection and conservation of the marine environment in the region.[2]

by 2030

The five oceans and seas that surround the region are at moderate to high risk of coastal eutrophication[3] by 2030, based on modelled data. The Red Sea and Gulf of Aden are at higher risk.[4]

Capture fisheries production has increased considerably since 1990, more than doubling in size by 2016. The Maghreb subregion reports the largest fisheries capture sector, followed by the Arab least developed countries.[5] The fisheries sector in Morocco accounts for 2.3 per cent of GDP and supports over half a million people.[6]

There are chronic gaps in regional assessments of the sustainability of fish stocks. Globally, the proportion of fish stocks that were fully depleted or overexploited increased to around 89 per cent in 2018.[7]

78% and 85%

A recent regional assessment of fisheries in the Mediterranean Sea highlights that around 78 per cent of marine stocks were at biologically unsustainable levels in 2018.[8] A national assessment in the Arab Gulf reported an 85 per cent depletion in the stocks of two key fish species, well beyond sustainable levels.[9]

Fish stock assessments for other marine areas around the Arab region are limited. Reported declines in catch volumes and the average size of fish are possible indicators of overfishing.

Marine litter

Marine litter, including plastic debris, is a growing problem in the region and globally with negative impacts on biodiversity.[10] In the Mediterranean Sea alone, marine litter negatively impacts more than 130 marine species.[11]

0.57 million tons per year

The Mediterranean Sea, representing 1 per cent of the world's water, receives 7 per cent of the world's plastic waste (0.57 million tons per year), resulting in contaminated food chains and water, and impacting public health.[12]

Measuring SDG 14 in the Arab region according to the global SDG indicator framework

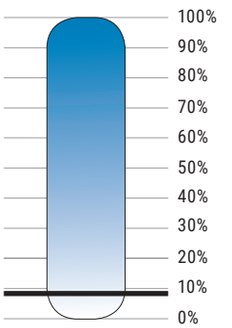
Data are available for 1 out of 10 indicators, covering 1 out of 10 targets under SDG 14.

The targets cover environmental, social and economic dimensions, and are linked to other international agreements, including the United Nations Convention on the Law of the Sea, the World Heritage Convention and international agreements regulating fishing and marine pollution.

The availability of national data for SDG 14 indicators is very poor. Several indicators are measured at the global or regional levels by international organizations such as FAO and UNESCO. Fish stock assessments involve complex modelling; such assessments are not expected at the national level. They rely on several kinds of data, including fishery catch data that are nationally reported as well as fishing effort and biological data.

Most SDG 14 indicators are still undergoing methodological development. In some cases, available methodological notes highlight datasets to fill data gaps in the short term. For example, data on average marine acidity are regularly collected in many regions through the International Oceanographic Commission of UNESCO as well as regional and national oceanographic data centres. The Arab region, however, currently has no such data centre.

Indicator coverage



SDG 14

The coverage of protected areas in relation to marine areas is the only indicator with national data available for the Arab region and a clear target of conserving at least 10 per cent of coastal and marine areas. The indicator does not capture the effectiveness of management arrangements for protected areas, however. This is an important factor in the Arab region, where marine areas may be protected under legislation, but lack effective management plans, "no-take" zones, and monitoring and enforcement arrangements to ensure sustainable management.

SDG 14 CONTAINS FOUR TARGETS TO BE ACHIEVED BY 2020

Of the 10 targets of SDG 14, four are to be achieved by 2020, highlighting the urgent nature of required interventions and the potential consequences of inaction.

TARGET 14.2 - On managing, protecting and building the resilience of ecosystems

TARGET 14.4 - On regulating harvesting, overfishing and illegal fishing

TARGET - 14.5 - On conservation

TARGET - 14.6 - On the prohibition of certain forms of subsidies

SDG 14 CONTAINS ONE TARGET TO BE ACHIEVED BY 2025

TARGET 14.1 - On preventing and reducing pollution

The main barriers to conserving and sustainably using the oceans, seas and marine resources for sustainable development in the Arab region

A large segment of people in the Arab region live near coastal areas. They rely on the services of marine ecosystems, which are linked to environmental health (SDGs 13 and 15) and human health (SDG 3), the tourism industry (SDG 8), as well as the fishing industry and artisanal fishing (SDGs 1 and 2). Harming these ecosystems directly impacts millions of lives and livelihoods.

Pollution and damage from land-based activities, sewage, toxic chemicals and industrial waste, oil spillage and plastics, as well as water transport activities, dredging and land reclamation (SDGs 6 and 9) are some of the leading causes of deterioration. The region also leads the world in seawater desalination, and the brine returned to sea impacts the marine environment as well as groundwater quality in karstic coastal zones.

Waters surrounding the Arab countries harbour great marine biodiversity. The Mediterranean Sea, the world's largest enclosed sea, is a hotspot of marine biodiversity with more than 17,000 reported species. One fifth are considered endemic.[13] The Arabian/Persian Gulf and Sea of Oman are characterized by high productivity, temperature and salinity. Yet they also support a range of coastal and marine ecosystems such as mangrove swamps, seagrass beds, coral reefs, and mud and sand flats. High biodiversity with many endemic species are also notable in the Red Sea and Gulf of Aden. The Red Sea, the world's warmest and most saline sea, has about 1,200 coral reef species.[14]

Marine life has suffered from past and current conflicts in the Arab region. Damaged infrastructure and a breakdown in law and order have magnified the impacts of pollution, untreated sewage and unregulated use of coastal land and marine resources. Limitations on fishing as a result of conflict and occupation have led to overfishing in constricted areas, and increased dredging and land reclamation.

Attempts to protect biodiversity and ecosystems, and to conserve areas for current and future generations remain few and far between. Concerted efforts are needed to manage and contain human activities that pollute and damage fragile ecosystems, and deplete fish stocks.

A recent Fisheries Resource Assessment Survey in the **Arabian Gulf** completed by the Environment Agency of Abu Dhabi revealed that more than 85 per cent of stocks of two key fish species were depleted. The study described the results as a conservation emergency that could result in the species' extinction. Attempts have been made to educate local fishermen on the dangers of overfishing, but monitoring is challenging.

Source: Al Wasmi, 2019.

The world's largest "dead zone" in the **Gulf of Oman** has grown dramatically in recent years. The so-called "oxygen minimum zone" is caused by warmer ocean temperatures driven by climate change, which cause bacteria to respire more, depleting oxygen supplies. Pollution may also play a role by increasing certain nutrients that cause algal and bacterial growth. The low levels of oxygen make it impossible for many creatures to survive.

Source: Queste and others, 2018.

These measures are also critical to regional and global actions to mitigate climate change.

THE FOLLOWING ARE THE KEY BARRIERS TO ACHIEVING SDG 14 IN THE ARAB REGION

The disconnect between economic growth and urbanization, and the sustainable management of marine and coastal ecosystems

Marine and coastal ecosystems are facing growing risks from habitat destruction; dredging and filling operations; production, transportation and processing of crude oil; overfishing; invasive species; pollution; ocean acidification and eutrophication; marine litter and plastic debris; brine from desalination and climate change. Many ecosystems critical to marine biodiversity, including beaches, wetlands, seagrass meadows and coral reefs, have been disrupted or depleted. Despite protection and conservation measures, including marine protected areas, many marine fish species are in danger of extinction. As an example of disjointed development, starting in the 1960s, GCC countries along parts of the Red Sea achieved an unmatched pace of development through petroleum-based economies.[15] But by the early 1990s, more than 40 per cent of their coasts had been modified through reclamation, resulting in significant biodiversity losses.[16]

Increased urbanization of coastal areas, and mismanagement or lack of regulation of waste and pollutants, in addition to the effects of climate change, have had determinantal consequences (SDGs 6, 7, 11, 12 and 13). These include impacts on food security and livelihoods (SDGs 1, 2, 3 and 8) through diminished fish stocks, which are further exacerbated by unregulated or illegal fishing or overfishing. In addition, raw discharges of sewage and inadequately treated domestic wastewater into the sea in some countries is adding pathogens and biological and chemical contamination. These spread infectious diseases and damage seafood safety.

Complex or inadequate regional management, coordination and planning

The five oceans and seas surrounding the Arab region are each guided by specific conservation organizations and management arrangements for fisheries.[17] This creates a complex framework for marine management, which varies considerably in its capacity and effectiveness in the face of many pressures on the marine environment. National socioeconomic factors such as increasing catch sizes, tourism and resource extraction generally outweigh regional or national environmental considerations. Effective planning of coastal development, management of discharges and water pollution, and regulation of marine-based activities remain key challenges. Where marine parks are in place, many lack no-take zones and enforcement arrangements critical for fishery recovery.[18]

Limited fish stock assessments and data

The exploitation of stocks is generally monitored through fish stock assessments, which are time and resource intensive. Assessment regularity and quality vary considerably. More sophisticated assessments are available for the Mediterranean Sea;[19] some national assessments have been conducted in the Arabian Gulf.[20] For other seas and oceans, the few available studies are dated and sporadic, with limited coverage of fish stocks and geographical areas.[21] The lack of assessment data makes it difficult to sustainably manage the fisheries sector.

A lack of monitoring and enforcement capabilities related to illegal fishing

The region also lacks data to assess illegal, unreported and unregulated fishing, which undercuts the capacity to monitor and enforce regulations, particularly for the least developed countries. The Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, which came into force in 2016, is regarded as an important step forward. Yet by August 2018, only five Arab countries had adhered to the agreement (Djibouti, Mauritania, Oman, Somalia and Sudan). Underreporting of fisheries capture is another key gap.[22]

Climate change threats to marine biodiversity

Climate change represents an emerging threat to oceans and seas, causing warmer ocean temperatures and higher acidity resulting in the destruction of coral reefs and other impacts, such as the expansion of dead zones.[23] A third of marine species could become extinct in the Arabian Gulf alone by 2090 due to rising water temperatures, and changes to salinity and oxygen levels.[24] Human stressors such as habitat destruction and overfishing exacerbate the risks.

At risk of being left behind

The contribution of **small-scale fisheries** to national economies in the region is relatively small. But for coastal communities, these fisheries are vital for food security, health and nutrition, income and livelihoods, and poverty alleviation, particularly in Lebanon, Mauritania, Morocco, Somalia, the State of Palestine and Yemen. Unsustainable fishing practices, illegal fishing, depletion of fish stocks, pollution and climate change threaten the livelihoods of communities dependent on small-scale fisheries. At the same time, efforts to ensure the sustainability of fish stocks can reduce catch sizes and incomes for these communities. Such measures should operate in tandem with appropriate social and economic supports to mitigate losses and protect livelihoods.

Small-scale fisheries provide employment in related activities such as fish processing, marketing, distribution, boat-building and net-making. **Women** are often heavily involved in the processing and trade of fish and fishery products, and globally make up 47 per cent of fisheries supply chain workers, equal to about 56 million jobs in the harvest and post-harvest sectors.[25] The lack of gender-disaggregated data on fishing activities in the region makes it difficult to understand the roles of women, however.

Governments in the **least developed countries** have limited institutional capabilities to protect their coastal waters from illegal fishing activities by national or foreign vessels. This can result in serious adverse consequences, such as piracy by local fisher people. They are highly vulnerable to the collapse of local fish stocks, given limited resources and alternative sources of food, income and livelihoods.

The ongoing **siege on Gaza** has severely limited the capacity of the Palestinian Government and its international partners to ensure the sustainable use of fish stocks, and reduce pollution and contamination. Infrastructure collapse from the targeted bombing of the Gaza Power Plant and other utilities has caused the failure of three sewage treatment plants, resulting in raw sewage being dumped in the sea. Continuing restrictions on the import of construction materials hampers repairs of these critical waste management facilities.

Forcing Gaza fishermen and women into shallow waters has dangerous implications for Gaza's coastal ecosystem, depleting fish stocks by increasing the exploitation of immature fish that have yet to reach breeding age. This has led to a dramatic depletion of fish stocks, with the total catch declining from around 4,000 tons in 1999 to approximately 3,305 tons in 2016. This has resulted in a surge in food insecurity in Gaza's growing population.

Source: State of Palestine, 2018.

Overfishing and illegal fishing off the coast of Somalia have devastated the livelihoods of coastal communities, and are regarded as the principal drivers of the outbreak of piracy. The waters off Somalia's 1,880-mile coastline are among the richest fishing grounds in the world, including shark, tuna, sardines, snapper and lobster. Somali law prohibits foreign ships from fishing within 15 miles of the coast and also bans destructive fishing methods. A lack of capacity to regulate and enforce the law, however, has enabled illegal fishing. Without a reliable source of income, many Somali fisher people have turned to piracy, attacking hundreds of cargo vessels.

Source: Brookings, 2017.

What the region can do to accelerate progress on SDG 14

The following actions are necessary to fill the gaps in regional knowledge on SDG 14 targets and indicators, and support appropriate policy responses to overcome barriers to the conservation and sustainable use of oceans, seas and marine resources.

1. Improve the production of knowledge, and strengthen the science-policy interface to support sustainable management,

- Improve the generation of data on the coastal and marine environment, and enhance the sharing of data and information across different institutions.
- Increase the coverage of regional assessments and data on marine resources and fisheries stocks, and the sustainability of fisheries capture activities.

2. Integrate marine protection and conservation into national development plans and urban development strategies in coastal areas:

- Assess the impact of pollution and damage on coastal communities.
- Enhance the efficiency of fishing to alleviate poverty in some communities while combating illegal and overfishing.
- Invest in sustainable tourism in coastal areas to generate decent work.

3. Improve marine fisheries management arrangements for all oceans and seas around the Arab region:

- Strengthen regional and subregional cooperation to ensure enforcement, and to enhance the capacity of the least developed countries to regulate and enforce fishing regulations and prevent illegal fishing.
- Implement sustainable fisheries management that adopts the Ecosystem Approach to Fisheries, the Code of Conduct for Responsible Fisheries, and the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.

4. Increase marine area protection and reduce key pressures on the marine environment:

- Expand marine and coastal protected areas in the region, including through the adoption of integrated management plans with no-take zones and adequate resourcing of management, monitoring and enforcement activities, and through cooperation among Arab States.
- Enhance regulation and management of environmental impacts on oceans from urban, industrial and agricultural development, including petrochemical and energy installations, coastal chemical industry and chlorine plants, eutrophication and pollution from urban and agricultural runoff, disposal of domestic and industrial discharges, dredging and filling operations, as well as tourism.
- Adopt an integrated coastal zone management approach to plan and manage the effects of coastal development on the coastal and marine environment, as well as to evaluate and manage the potential effects of sea level rise and coastal inundation on vulnerable coastal areas as a result of climate change.

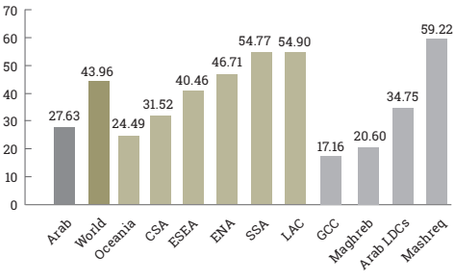
SDG 14 targets and indicators in the Arab region

Target	Indicator	Data
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	**14.1.1** Index of coastal eutrophication and floating plastic debris density	Adopted criteria to obtain a regional average are not met for this indicator.
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	**14.2.1** Proportion of national exclusive economic zones managed using ecosystem-based approaches	Adopted criteria to obtain a regional average are not met for this indicator.
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	**14.3.1** Average marine acidity (pH) measured at agreed suite of representative sampling stations	Adopted criteria to obtain a regional average are not met for this indicator.
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	**14.4.1** Proportion of fish stocks within biologically sustainable levels	Adopted criteria to obtain a regional average are not met for this indicator.

14.5
By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information

14.5.1
Coverage of protected areas in relation to marine areas

Figure 1 Average proportion of marine key biodiversity areas covered by protected areas (percentage)



Note: All means are weighted by the total marine key biodiversity area in square kilometers (i.e., the denominator) for 2016, taken from data before June 2018 (United Nations Statistics Division, 2017). The calculated Arab regional aggregate includes the data values of the following Arab countries for 2017: Algeria, Bahrain, Comoros, Djibouti, Egypt, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

This measure "reflects trends in protected area coverage for countries or regions with few or no key biodiversity areas that are completely covered. It recognizes the extreme variation of biodiversity importance over space (Rodrigues and others, 2004), and so does not risk generating perverse outcomes through the protection of areas which are large at the expense of those which require protection" (United Nations Statistics Division, 2019b).

14.6
By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation

14.6.1
Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing

Adopted criteria to obtain a regional average are not met for this indicator.

14.7
By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism

14.7.1
Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries

Adopted criteria to obtain a regional average are not met for this indicator.

14.a
Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries

14.a.1
Proportion of total research budget allocated to research in the field of marine technology

Adopted criteria to obtain a regional average are not met for this indicator.

14.b Provide access for small-scale artisanal fishers to marine resources and markets	**14.b.1** Progress by countries in the degree of application of a legal/regulatory/ policy/institutional framework which recognizes and protects access rights for small-scale fisheries	Adopted criteria to obtain a regional average are not met for this indicator.
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want"	**14.c.1** Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nations Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	Adopted criteria to obtain a regional average are not met for this indicator.

Note: Central and Southern Asia (CSA); Eastern and South-Eastern Asia (ESEA); Europe and Northern America (ENA); Gulf Cooperation Council (GCC); Latin America and the Caribbean (LAC); Arab Least Developed Countries (Arab LDCs); Oceania (excluding Australia and New Zealand); Sub-Saharan Africa (SSA).

All figures are based on the Global SDG Indicators Database (United Nations Statistics Division, 2018) except for updated data for indicator 14.5.1 [Average proportion of Marine Key Biodiversity Areas (KBAs) covered by protected areas (percentage)] (United Nations Statistics Division, 2019a).

ENDNOTES

1. Calculated by ESCWA, see figure 1.
2. PERSGA, 2010.
3. Eutrophication is the increased primary productivity (trophy) in a water body due to enhanced availability of nutrients, generally caused by the discharge of insufficiently purified municipal wastewater and drainage from fertilized agricultural areas (Hupfer and Hilt, 2008).
4. Seitzinger and Mayorga, 2008.
5. Analysis by ESCWA based on FAO, 2017a.
6. FAO, 2017b.
7. Kituyi and Thomson, 2018.
8. FAO, 2018.
9. Al Wasmi, 2019.
10 UN Environment, 2019.
11. Deudero and Alomar, 2015.
12. Dalberg Advisors, WWF Mediterranean Marine Initiative, 2019.
13. Coll and others, 2010.
14. Gladstone, 2008; PERSGA, 2006, 2010.
15. Gladstone, 2008.
16. Hamza and Munawar, 2009; UN Environment, 2016.
17. These are the Mediterranean Sea, Arabian/Persian Gulf and Sea of Oman, Red Sea and Gulf of Aden Sea, Southwest Indian Ocean and Eastern Central Atlantic Ocean. Fisheries are primarily governed by several regional fisheries bodies for the Eastern Central Atlantic, the Mediterranean, the Arabian/Persian Gulf and Sea of Oman, and the Southwest Indian Ocean. International commissions govern some fish species such as tuna.
18. Guidetti and others, 2014.
19. FAO, 2018.
20. Al Wasmi, 2019.
21. Sanders and Morgan, 1989.
22. Abdulrazzak and others, 2015.
23. Queste and others, 2018.
24. Wabnitz and others, 2018.
25. Lentisco and Lee, 2015.

REFERENCES

Abdulrazzak, Dalal, and others (2015). "Total Marine Fisheries Catches in the Persian/Arabian Gulf from 1950 to 2010". Regional Studies in Marine Science 2 (November): 28–34. https://doi.org/10.1016/J.RSMA.2015.08.003.

AFED (Arab Forum for Environment and Development) (2009). Report of the Arab Forum for Environment and Development—Arab Environment: Impact of Climate Change on Arab Countries. Mostafa Tolba and Najib Saab, eds. www.afedonline.org/afedreport09/Full English Report.pdf.

Al Wasmi, Naser (2019). "Some 85% of Key Fish Species in Arabian Gulf Wiped out, UAE Study Finds". The National, 27 January. www.thenational.ae/uae/environment/some-85-of-key-fish-species-in-arabian-gulf-wiped-out-uae-study-finds-1.818543.

Brookings (2017). "Figures of the Week: Piracy and Illegal Fishing in Somalia". Africa in Focus. www.brookings.edu/blog/africa-in-focus/2017/04/12/figures-of-the-week-piracy-and-illegal-fishing-in-somalia/.

Coll, Marta, and others (2010). "The Biodiversity of the Mediterranean Sea: Estimates, Patterns, and Threats". PLoS ONE 5(8): e11842. Steven J. Bograd, ed. https://doi.org/10.1371/journal.pone.0011842.

Dalberg Advisors, WWF Mediterranean Marine Initiative (2019). "Stop the Flood of Plastic: How the Mediterranean Countries Can Save Their Sea". www.wwf.fr/sites/default/files/doc-2019-06/20190607_Rapport_Stoppons_le_torrent_de_plastique_WWF-min.pdf.

Deudero, Salud, and Carme Alomar (2015). "Mediterranean Marine Biodiversity under Threat: Reviewing Influence of Marine Litter on Species". Marine Pollution Bulletin 98(1–2): 58–68. https://doi.org/10.1016/J.MARPOLBUL.2015.07.012.

FAO (Food and Agriculture Organization of the United Nations) (2017a). "Fishery and Aquaculture Statistics—Capture Production". 2017. www.fao.org/fishery/static/Yearbook/YB2017_USBcard/navigation/index_content_capture_e.htm#D.

——— (2017b). "Morocco: A Maritime Fishing Nation Works to Develop Its Aquaculture Sector". Blue Growth Blog, April. www.fao.org/blogs/blue-growth-blog/morocco-a-maritime-fishing-nation-works-to-develop-its-aquaculture-sector/en/.

——— (2018). "The State of Mediterranean and Black Sea Fisheries". Rome: General Fisheries Commission for the Mediterranean. www.wipo.int/amc/en/mediation/rules.

Gladstone, William (2008). "Towards Conservation of a Globally Significant Ecosystem: The Red Sea and Gulf of Aden". Aquatic Conservation: Marine and Freshwater Ecosystems 18(1): 1–5. https://doi.org/10.1002/aqc.925.

Guidetti, Paolo, and others (2014). "Large-Scale Assessment of Mediterranean Marine Protected Areas Effects on Fish Assemblages". PLoS ONE 9(4): e91841. Brian R. MacKenzie, ed. https://doi.org/10.1371/journal.pone.0091841.

Hamza, Waleed, and Mohiuddin Munawar (2009). "Protecting and Managing the Arabian Gulf: Past, Present and Future". Aquatic Ecosystem Health & Management 12(4): 429–39. https://doi.org/10.1080/14634980903361580.

Hupfer, M., and S. Hilt (2008). "Lake Restoration". Encyclopedia of Ecology: 2080-2093. https://doi.org/10.1016/B978-008045405-4.00061-6.

Kituyi, Mukhisa, and Peter Thomson (2018). "90% of Fish Stocks Are Used up – Fisheries Subsidies Must Stop". World Economic Forum. www.weforum.org/agenda/2018/07/fish-stocks-are-used-up-fisheries-subsidies-must-stop/.

Lentisco, Angela, and Robert U. Lee (2015). "A Review of Women's Access to Fish in Small-Scale Fisheries". Fisheries and Aquaculture Circular. FIRO/C1098. Rome: FAO. www.fao.org/3/a-i4884e.pdf.

PERSGA (The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden) (2006). "State of the Marine Environment—Report for the Red Sea and Gulf of Aden: 2006". www.cbd.int/doc/meetings/mar/ebsaws-2015-02/other/ebsaws-2015-02-persga-submission1-en.pdf.

——— (2010). "The Status of Coral Reefs in the Red Sea and Gulf of Aden: 2009". Jeddah. https://reefcheck.org/PDFs/persga.pdf.

PERSGA (Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden), and GEF (Global Environent Facility) (2003). "Status of the Living Marine Resources in the Red Sea and Gulf of Aden and Their Management". Jeddah. www.persga.org/Files/Publications/Technical/TS/TS4_Status_LMR_in_RSGA_E_P2.pdf.

Queste, Bastien Y., and others (2018). "Physical Controls on Oxygen Distribution and Denitrification Potential in the North West Arabian Sea". Geophysical Research Letters 45(9): 4143–52. https://doi.org/10.1029/2017GL076666.

Sanders, M. J., and G. R. Morgan (1989). "Review of the Fisheries Resources of the Red Sea and Gulf of Aden". Rome. www.fao.org/3/a-t0152e.pdf.

Seitzinger, Sybil, and Emilio Mayorga (2008). "Chapter 7.3 Nutrient Inputs from River Systems to Coastal Waters". Large Marine Ecosystems: Status and Trends: 179–195. Nairobi: United Nations Environment Programme. https://doi.org/10.1016/B978-012374473-9.00292-7.

State of Palestine (2018). "Palestinian National Voluntary Review on the Implementation of the 2030 Agenda". https://sustainabledevelopment.un.org/content/documents/20024VNR2018PalestineNEWYORK.pdf.

UN Environment (2019). Global Environment Outlook—GEO-6: Healthy Planet, Healthy People. Paul Ekins, Joyeeta Gupta and Pierre Boileau, eds. Nairobi: Cambridge University Press. https://doi.org/10.1017/9781108627146.

United Nations Environment Programme (2006). "The State of the Marine Environment Trends and Processes". The Hague. https://wedocs.unep.org/bitstream/handle/20.500.11822/12469/global_soe_trends.pdf?sequence=1&isAllowed=y.

——— (2016). GEO-6: Global Environment Outlook: Regional Assessment for West Asia. Nairobi. https://www.unenvironment.org/resources/report/geo-6-global-environment-outlook-regional-assessment-west-asia.

United Nations Statistics Division (2017). "Global SDG Indicators Database". Retrieved 1 June 2018. https://unstats.un.org/sdgs/indicators/database/.

——— (2018). "Global SDG Indicators Database". https://unstats.un.org/sdgs/indicators/database/.

——— (2019a). "Global SDG Indicators Database". https://unstats.un.org/sdgs/indicators/database/.

——— (2019b). "SDG Indicators Metadata Repository". https://unstats.un.org/sdgs/metadata/.

Wabnitz, Colette C. C., and others (2018). "Climate Change Impacts on Marine Biodiversity, Fisheries and Society in the Arabian Gulf". PLoS ONE 13(5). https://doi.org/10.1371/journal.pone.0194537.