



International Journal of Fisheries and Aquatic Studies

E-ISSN: 2347-5129

P-ISSN: 2394-0506

(ICV-Poland) Impact Value: 76.37

(GIF) Impact Factor: 0.549

IJFAS 2025; 13(3): 08-12

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www.fisheriesjournal.com

Received: 14-02-2025

Accepted: 15-03-2025

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A review of the fisheries industry in the UAE: Current challenges, management strategies, and future prospects

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DOI: <https://www.doi.org/10.22271/fish.2025.v13.i3a.3070>

Abstract

This paper provides a comprehensive overview of the fisheries industry in The United Arab Emirates UAE, highlighting critical challenges such as overfishing, habitat degradation, and the impact of climate change on fish stocks. The research identifies gaps in current management strategies and regulatory frameworks. Major findings reveal that ineffective enforcement of fishing regulations and lack of sustainable practices have led to declining fish populations. The study concludes that to secure the future of the UAE's fisheries, integrated management strategies that promote sustainable fishing practices, habitat restoration, and community engagement are essential for balancing economic growth with environmental sustainability.

Keywords: Fisheries industry, seafood, overfishing, sustainable fisheries

1. Introduction

Following the significant socio-economic transformations in the UAE that began with the first oil shipment from Dass Island, Abu Dhabi, in 1962, the region's economy became a magnet for millions worldwide. This influx of talent and investment has spurred growth across various sectors, including fisheries, to meet the increasing demand for food ^[12, 8].

The United Arab Emirates, with its extensive coastline and rich marine biodiversity, has a long-standing fishing tradition. Historically, fishing has been a crucial livelihood for local communities, contributing to the culinary culture and economic stability of the region. However, rapid urbanization, population growth, and industrial activities have led to significant challenges in sustaining the fisheries sector. The fisheries sector in the UAE is mainly characterized by artisanal practices, with the exception of four small purse seine vessels that operate seasonally from Sharjah. These vessels focus on catching sardines and anchovies at night through the use of light attraction methods ^[9]. Nonetheless, this seasonal activity results in minimal landings.

Most of the artisanal fisheries in the UAE rely on wooden dhows and fiberglass speedboats, commonly referred to as tarads. These vessels employ a variety of fishing techniques, such as gargo traps, gillnets, handlines, and drop lines, primarily targeting fish species including groupers, emperors, jacks, sweetlips, and scads ^[17]. If we take Abu Dhabi as an example, we will find that the key species in the Abu Dhabi fisheries, ranked by weight, included Emperors (25%), Groupers (24.7%), Jacks (16.5%), Sweetlips (10.5%), and Scads (5.2%) ^[5].

A significant portion of the total catch, amounting to 6,438 tonnes, was recorded in Eastern Abu Dhabi, with the Abu Dhabi Free Port contributing to 78.6% of this total. Traditional wooden dhows were responsible for landing 6,109 tonnes, which represents 74.6% of the overall catch. In 2002, the total fishing effort was estimated at 12,740 trips by tarads and 7,752 trips by dhows. The 41% increase in catch was linked to a rise in landings by tarads (12.3%) and dhows (23.9%) compared to the previous year, 2001. Pelagic catches are primarily comprised of Spanish mackerel (*Scomberomorus spp.*) along with other large pelagic species. In contrast, smaller pelagic fish such as sardinella and anchovies are typically found in inshore waters, particularly near Ras al-Khaimah and along the east coast near Al-Fujairah, where they are caught using beach seines and set nets.

Although there are four small purse seine vessels that operate seasonally from Sharjah, there is currently no industrial fishery targeting small pelagic species, despite several previous attempts to establish such an industry. In 2006, the UAE's fish catch peaked at 100,000 tons, but declined to 72,700 tons in 2012 (Table 1). Meanwhile, the UAE's fish

catch was valued at 1.2 million AED in 2012. The majority of the fish caught comes from Sharjah, Abu Dhabi, Fujairah, and Ras-Al-Khaimah. The Food and Agriculture Organization (FAO, 2013) states that the Sharjah and Ras-Al-Khaimah Emirates, as well as the vicinity of the Straits of Hormuz, are the most fertile regions.

Table 1: Annual fish catch quantities by Emirate, 2006-2012 (in Tonne)

Emirate	2006	2007	2008	2009	2010	2011	2012
Abu Dhabi	5,541	5,336	5,362	5,977	6,333	3,922	4,399
Dubai	7,169	6,904	6,551	10,078	8,948	8,060	11,830
Sharjah	31,414	30,158	18,059	18,995	18,487	18,650	16,894
Ajman	4,865	4,685	5,150	5,503	5,892	6,700	6,360
Umm Al-Quwain	1,075	1,045	4,996	7,681	6,649	5,735	5,490
Ras Al-Khaimah	29,105	27,941	18,755	17,199	17,898	17,412	16,673
Fujairah	21,234	20,384	15,203	12,272	15,403	14,668	11,082
Total for the UAE	100,403	96,453	74,076	77,705	79,610	75,147	72,728

Accordingly, fisheries total catch of UAE decreases significantly from 78,000.0 tons in 2017 to 68,000.0 tons in 2022 (table 2). This table is a result of converting a diagram found in fisheries and aquaculture in UAE 2024, into a table.

Table 2: Explains annual fish catch of UAE, 2017-2022 in tonnes.

Year	Total Catch (in Tonne)
2017	78,000.0
2018	76,000.0
2019	74,000.0
2020	72,000.0
2021	70,000.0
2022	68,000.0

2. Inland Fisheries

Because of the arid nature of most of the country, there are no natural inland fisheries in the UAE. However, inland aquaculture (land-based fish farming) exists and is growing.

3. Decline of the Fisheries Industry in the UAE

Fishing has long been a staple of the economy in the UAE, but recent developments have brought significant challenges. The rapid urbanization, marked by the construction of new residential areas and tourism facilities, has encroached on coastal regions, displacing many fishing communities. Consequently, the fishing industry in the UAE is now grappling with sustainability issues, including the need to find ways to maintain healthy fish stocks and to tackle unsustainable fishing practices that persist in the region.

As the United Arab Emirates rapidly developed-driven by revenues from its major oil industry and an increasingly important tourism sector-the economic contribution of the commercial fishing industry has declined significantly.

In the 1960s (pre-oil era), fisheries contributed more than 40% to the UAE's Gross Domestic Product (GDP). By 2001, this figure had dropped to less than 0.1% of GDP. The decline has been further exacerbated by overfishing, habitat degradation, and depleting fish stocks in regional waters [7].

4. Cultural and Social Importance

The fisheries sector may have diminished in its economic importance, but it remains deeply woven into the cultural fabric of the UAE. This is especially true in coastal communities, where it continues to reflect the heritage of the emirates. Traditional fishing practices and the invaluable local knowledge associated with them are still lovingly passed down through generations. In many coastal villages, fishing retains a vital role in shaping social connections and identity,

even though it may no longer serve as the primary source of income [16].

5. Challenges Facing the UAE Fisheries Industry

5.1 Overfishing and Resource Depletion

One of the most significant challenges facing fisheries today is overfishing. This occurs when fishing pressure exceeds the capacity of fish populations to replenish themselves. Overfishing can lead to a decline in fish populations, which can have a cascading effect on the entire ecosystem [11].

The overexploitation of fish stocks is perhaps the most pressing challenge facing the UAE fisheries sector. According to the Food and Agriculture Organization [9], many fish species in the Arabian Gulf are either overfished or approaching overfished status. The demand for seafood in both local and export markets has exacerbated this issue. Over the past sixteen years, extensive scientific studies on fisheries by Ministry of Climate Change and Environment MOCCA, Environment Agency-Abu Dhabi EAD, and other relevant authorities across the UAE have shown alarming trends in UAE key fisheries resources, which are facing severe overexploitation. The most recent and thorough Fisheries Resources Assessment Survey (FRAS), conducted in 2016-2017, highlights that the demersal fishery is in critical condition. Alarmingly, species such as hamour (orange-spotted grouper), shaari (spangled emperor), and farsh (painted sweetlips) have been found to be at only about 10% of their average adult stock size (Table 3).

5.2. Environmental Concerns

5.2. a. Marine pollution, habitat destruction, pose severe threats to fish populations. Industrial runoff, urban wastewater discharge, and oil spills have all contributed to declining water quality and habitat loss [2].

5.2. b. Fish stocks, ecosystems, and livelihoods of individuals reliant on marine resources are affected by climate change in the UAE in the following ways:

(i) Rising Sea Temperatures

It is possible that higher sea temperatures will cause a reduction in fish productivity and alter distribution patterns, which could ultimately impact commercial fish species that

are essential for the food and beverage industry.

(ii) Ocean Acidification

Increased atmospheric CO₂ levels result in higher ocean acidity, which adversely affects marine organisms, particularly those with calcium carbonate structures. This acidification can impair fish reproductive processes and juvenile survival rates, leading to declines in fish populations and affecting the overall health of marine ecosystems [18].

(iii) Habitat Degradation

Climate change plays a significant role in the deterioration of essential marine ecosystems, including coral reefs,

mangroves, and seagrass beds. These environments are vital as breeding and nursery grounds for numerous fish species. The destruction of these habitats, driven by increasing temperatures and rising sea levels, may result in reduced fish populations and a decline in biodiversity [18].

(v) Decline in Fish Catch Potential

Many studies suggest that the UAE may face a notable decrease in its fish catch potential as a result of climate change. Researches indicate a possible decline of more than 26% in future fish catches, which could have serious economic and food security impacts on the region [4].

Table 3: Summarizing key statistics on overfishing and resource depletion in the UAE

Category	Statistic	Source / Year
Overexploited Fish Stocks	80% of UAE fish stocks overexploited or depleted	Federal National Council (2015)
Hamour (Orange-spotted Grouper)	overexploited with about 12% of their average adult stock size	The UAE National Framework Statement for Sustainable Fisheries (2019-2030)
Shaari (Spangled Emperor)	overexploited with about 13% of their average adult stock size	The UAE National Framework Statement for Sustainable Fisheries (2019-2030)
Farsh (Painted Sweetlips)	Stock at 7% of original adult population	The UAE National Framework Statement for Sustainable Fisheries (2019-2030)
Commercial Catch Impact	13 species = 80% of catch; 88% of revenue	Multiple sources
Sustainable Exploitation Index	Rose from 8.9% in 2018 → 69.1% in 2022	Environment Agency -Abu Dhabi (2022)
Fish Extinction Risk	Many popular species could vanish in 20 years	Multiple sources
Fishing Pressure	Some species are fished 6-10x the sustainable level	Multiple sources

Table 4: Key environmental concerns facing UAE Fisheries

Concern	Impact on Fisheries
Overfishing	Leads to stock depletion; 80% of species overexploited, disrupting food chains and reducing long-term yields
Habitat Destruction	Coastal development, land reclamation, and dredging damage coral reefs, sea grass beds, and breeding grounds
Climate Change & Rising Sea Temperatures	Coral bleaching and shifting species distribution reduce fish productivity and habitat suitability
Pollution (Oil, Plastic, Wastewater)	Pollutant's harm marine life and contaminate fish stocks, making them unsafe or unsellable
Marine Traffic & Noise Pollution	Interferes with fish behavior, breeding, and feeding; especially affects sensitive species
Invasive Species	Introduced species can compete with or prey on native fish, altering marine ecosystems
Decline in Water Quality	Linked to urban runoff, sewage discharge, and desalination brine affecting oxygen levels and marine biodiversity
Illegal & Unregulated Fishing	Undermines conservation efforts and accelerates resource depletion

5.3 Competition from Imported Seafood

The United Arab Emirates has a rich maritime heritage, with fishing being a cornerstone of its cultural and economic landscape. However, the local fisheries industry faces significant challenges due to the increasing competition from imported seafood. This competition affects various aspects of the industry, from economic viability to sustainability efforts. The UAE imports a significant portion of its seafood, which competes with local fishermen. In addition to that, the UAE is increasingly reliant on imports (~ 72%) to meet demand for seafood [6, 10]. While imported seafood provides variety, it also threatens local fishers' livelihoods, especially when competing with cheaper imports [13]. Imported seafood presents a major economic and market-based challenge to the UAE's fisheries industry, which can be summarized in these points.

A. Price Competition

Imported fish from countries like India, Pakistan, Oman, and Southeast Asia tend to be more affordable due to their lower labor and production costs. As a result, many local consumers choose for these cheaper alternatives, which in turn exerts

downward pressure on the prices of domestic fish.

B. Availability and Variety

Imports ensure year-round availability of a wider variety of seafood than local waters can sustainably supply. This reliability and diversity attract supermarkets and hospitality sectors that prioritize consistency.

C. Supply Chain and Quality Control

Imported seafood is usually frozen and overseen by vast, efficient supply networks that maintain standards of quality. The infrastructure required to match the logistics and preservation of imported items is lacking in certain local fisheries, however.

D. Consumer Preferences and Perceptions

The general public, particularly the sizable expat population, might not be able to tell the difference between locally and imported fish, even though some Emiratis prefer fresh local fish. Consumer decisions might also be influenced by the branding and marketing of imported seafood [3].

5.4. Lack of Modern Fishing Practices

Many local fishermen still use traditional fishing methods, which can be less efficient and more environmentally damaging. The absence of modern technologies contributes to low yields and unsustainable practices.

6. Solutions to Address Challenges

6.1 Sustainable Fishing Practices

Implementing sustainable fishing practices is essential for the long-term viability of the fisheries industry. This includes establishing catch limits, seasonal fishing bans, and protected marine areas. Government bodies, such as the Ministry of Climate Change and Environment, have already initiated measures to regulate fishing activities ^[14].

6.2 Promoting Aquaculture

Investing in aquaculture presents a viable solution to alleviate the pressures on wild fish stocks. The UAE has begun to explore sustainable aquaculture systems that can provide an alternative source of seafood while ensuring environmental protection ^[4].

6.3 Technological Advancements

Using contemporary fishing technology can improve sustainability and efficiency. Overfishing and its effects on the ecosystem can be lessened by the use of technologies like satellite tracking for fishing boats, automated data collecting for fish stock monitoring, and the adoption of selective fishing gear ^[2].

6.4. Enhanced Education and Awareness

Increasing awareness of sustainable practices among both consumers and fishermen is crucial. Educational campaigns and community involvement can play a significant role in fostering a culture of sustainability, encouraging responsible fishing, and promoting local seafood consumption ^[1, 15].

6.5 Strengthening Policy and Governance

Robust regulatory frameworks and enforcement mechanisms are vital for sustainable fisheries management. The establishment of cooperative management initiatives that involve local fishing communities in decision-making processes can enhance stakeholder engagement and compliance with regulations ^[5].

7. Future Prospects of the Fisheries Industry in the UAE

Successful implementation of the previously described solutions is essential to the future of the UAE's fishing sector. Economic interests and environmental care can be balanced via the use of sustainable methods, technical innovations, and aquaculture to diversify the seafood supply.

Moreover, encouraging collaborations between local communities, private sector players, and governmental organizations can improve the effectiveness of resource management. The National Agenda and Vision 2021, the UAE's vision for a sustainable future, emphasize the significance of managing resources, particularly fisheries, in a sustainable manner.

8. Further Recommendations

- Strengthen enforcement of existing fishing regulations.
- Expand marine protected areas and implement ecosystem-based management.

- Invest further in sustainable aquaculture practices.
- Increase funding for marine research and data collection.
- Launch a series of nationwide campaigns to raise awareness among consumers and fishermen.
- Collaborate regionally on shared marine resource management.

9. Conclusion

By adopting contemporary methods, improving governance, and inviting community involvement, the UAE can safeguard its fisheries for the long-term and protect marine biodiversity.

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