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The State of Fisheries in Hadramawt

Insights from a Scoping Review

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Key Findings

A synthesis of secondary sources and key informant interviews with stakeholders in the fisheries sector in Yemen supports the following policy recommendations:

- Organize a stock assessment for the Gulf of Aden as a basis for the development of scientific fisheries management plans.
- Establish low-cost, high-frequency data collection systems at landing sites to track changes in fishing effort and the volume and composition of fish landings.
- Conduct qualitative studies of the governance of fish landing sites to diagnose more effective ways of interacting with and supporting the institutions that manage them.
- Mandate the installation of electronic vessel monitoring systems on boats large enough to undertake long-distance fishing trips to increase transparency.
- Pay closer attention to domestic fish trade, fishmeal manufacturing, and fish processing for domestic markets and explore systems for monitoring fish exports more accurately.
- Study the “ice value chain” and conduct experiments to better understand fishers’ and consumers’ perceptions, incentives, and demand for ice.
- Implement representative household surveys to reveal fish consumption patterns and their nutrition implications.

Fisheries are a key component of the economy, food system, and livelihoods in southern Yemen. They are also central to rural development and reconstruction efforts. Security risks, scarce resources, and institutional ruptures have hampered collection of fisheries statistics since the start of the conflict in 2015, but there were already significant data gaps and underreporting of catches prior to this time (Wagenaar and D’Haese, 2007; Derrick et al., 2023). As a result, there is little reliable information on many facets of Yemen’s fisheries. These knowledge gaps hinder the design of evidence-based development programs, interventions, policies, and fisheries management.

In this project note, we review prior research and integrate insights from 14 semi-structured key informant interviews with experts on fisheries in southern Yemen to synthesize current knowledge on fisheries in Hadramawt governorate—home to the largest population of fishers in Yemen—and identify gaps that warrant further investigation.

Box 1: Information sources

Literature review: Relevant publications were identified in Google Scholar using the search terms "Yemen" AND "fish*" and augmented with unpublished materials made available by development partners working in Yemen. We identified 198 publications on fisheries in Yemen. Of these, 153 were excluded because they did not focus on Hadramawt or the Gulf of Aden, leaving 45 for inclusion in the review. Approximately half of these items were project reports, many of them unpublished.

Key informant interviews: Fourteen semi-structured interviews were conducted remotely in English or Arabic with key informants identified by snowball sampling. All interviewees were experts familiar with fisheries in southern Yemen. They included government officials, representatives of fisheries cooperatives and private businesses, university faculty, and staff of international organizations.

Findings from our review and interviews are synthesized below. Each section highlights informational needs and priority areas for future applied research on fisheries in southern Yemen. These recommendations are summarized above.

Target species, stocks, landings

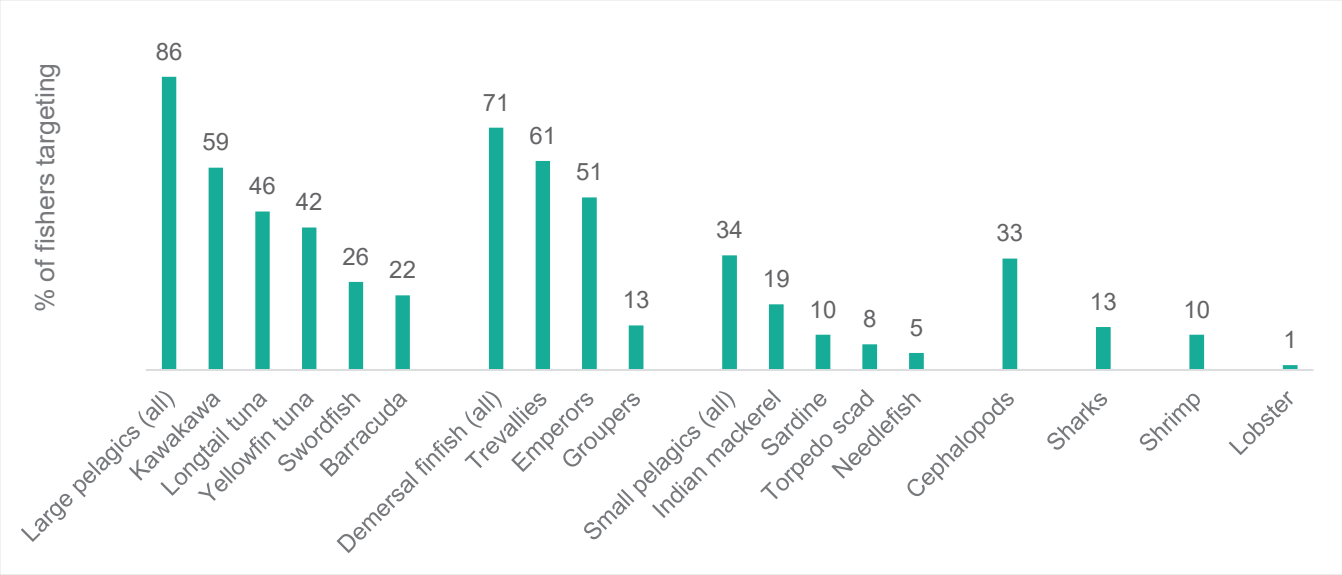
The Gulf of Aden and the Arabian Sea provide an estimated 65 to 70 percent of Yemen's total fish production (Impact Consulting, 2022). Along the coast of the Gulf of Aden, the major species groups, in descending order of numbers of fishers targeting them, are: (1) large pelagic fish (most importantly, yellowfin and longtail tuna and kawakawa), (2) demersal reef fish (including trevallies, emperors, and groupers), (3) small pelagic fish (e.g., Indian mackerel and sardines), (4) cephalopods (e.g., cuttlefish), (5) sharks, (6) shrimp; and (7) lobster.

Overfishing is widely perceived to have caused declines in the stock of several key species groups, as reported by key informants and in the literature. As more valuable stocks have been depleted, fishing effort has been redirected toward alternative stocks. This has led first to overfishing of once abundant sea cucumber, rock lobster, and sharks, then to overexploitation of demersal fish, and most recently, to increasing pressure on pelagic species, including the targeting of small pelagic fish to produce fishmeal. Catches of migratory pelagic species fluctuate widely over time with variations in oceanic currents and primary productivity, making it difficult to assess long-run trends in their abundance.

It is difficult to triangulate these widely observed trends with fishery statistics, because very little "fishery dependent data" (that is, data based on landings) is available. Auctioneers at landing sites typically maintain records of the value of fish traded, but not the species or quantity, and government fisheries

officers lack resources to carry out regular data collection. Furthermore, as widely remarked in the literature and by key informants, no reliable stock assessment (scientific measurement of fish abundance and biomass based on trawl and/or hydroacoustic surveys) has been conducted in Yemeni waters since the 1990s (De Young, 2006).

Figure 1: Main target groups and species for fishers on the Gulf of Aden Coast, Yemen (% of fishers targeting)



Source: Modified from Apex Consulting (2025)

Knowledge gaps and research priorities

Stock assessments are a precondition for the development of scientific fisheries management plans. To date, no development partner has supported such an exercise in Yemen. The Food and Agriculture Organization of the United Nations (FAO)'s EAF-Nansen Programme is dedicated to conducting fisheries stock assessment surveys in developing countries. Working with the Nansen program to **organize a stock assessment for the Gulf of Aden** should be priority for any future large-scale fisheries development program. Establishing alternative **low-cost systems for high-frequency data collection** at fish landing sites should also be explored in collaboration with fisheries associations and Yemen's General Authority of Fisheries (GAF).

Fishing vessels and fishing gears

Yemen's fishery policy is unusual in that it has prioritized development of the artisanal fishing sector over the promotion of industrial fishing since the early 2000s. Trawling was banned by ministerial decree in 2003, no new licenses have been issued for industrial vessels since 2004 (Gachoud, 2020), and agreements allowing foreign industrial fleets access to Yemeni waters have been gradually phased out (Alabsi and Komatsu, 2014). However, industrial trawling continued on a large scale in Hadramawt until 2012, when public protests by fishers led to more active enforcement of the ban. Some licensed and illegal trawlers are still reported to operate in Yemeni waters, but artisanal fishers are thought to account for more than 90 percent of total production (Anon, 2020).

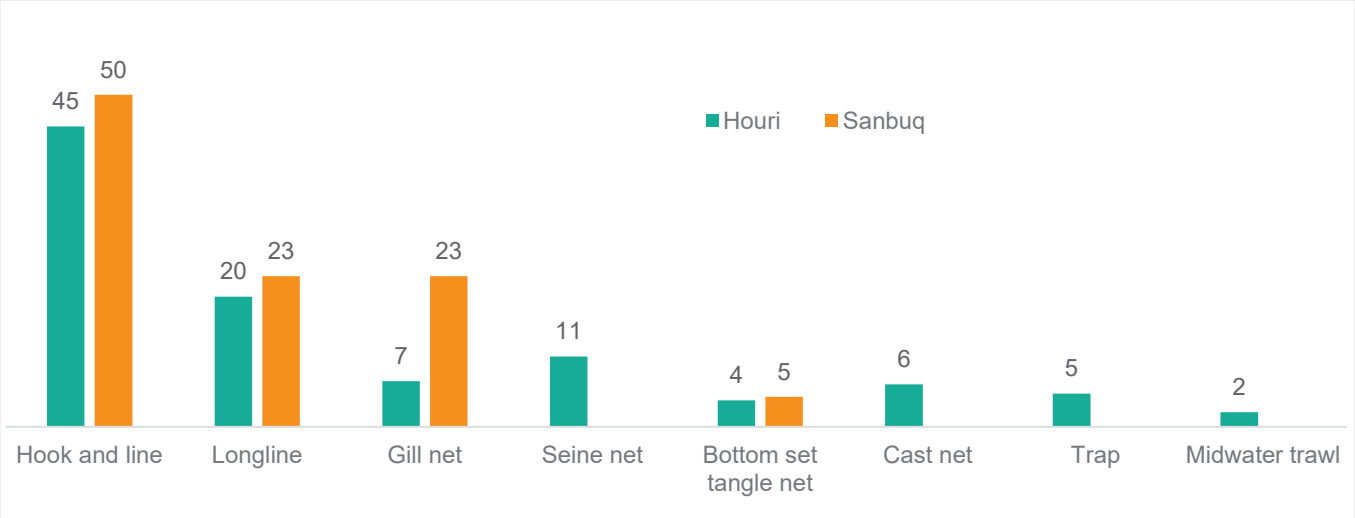
A recent census of fishing vessels identified 17,917 fishing boats in the seven governorates on the Gulf of Aden Coast, of which 12,758 (about 77 percent) are operational. These vessels are estimated to have a total crew of 63,049 fishers. This is a substantial increase from 2018, when a prior survey estimated there were 10,403 fishing boats and 37,760 fishers on the Gulf of Aden coast. Hadramawt governorate is home to more fishing vessels than any other, accounting for 28 percent of the boats on the Gulf of Aden (Apex Consulting, 2025).

Fishing boats are of two main types: *houri* and *sanbuq* (sometimes also referred to as *abri*). *Houri* account for 98.8 percent of all fishing boats. They range from 4–16 m in length, with most (64 percent) sized 6—10 m. About 30 percent of fishing boats (mainly those under 5 m) have no outboard motor, while most 6–10 m boats are powered by a single outboard motor (Apex Consulting, 2025). Smaller *houri* typically have 2–4 crew members, often family members, and make fishing trips lasting less than 12 hours. Larger *houri* may have 5–15 crew members and typically make trips lasting 12–48 hours.

Sanbuq range from 8 to more than 26 m in length. Most have large inboard engines and make trips lasting 10-20 days or more. They travel long distances, often fishing close to, or inside, Somali waters. Almost all *sanbuq* on the Gulf of Aden coast are based in Hadramawt governorate, where they account for 4 percent of fishing boats (Apex Consulting, 2025). *Sanbuq* work as transport vessels, delivering supplies to distant fishing boats and collecting fish from them, allowing the fishing fleet to remain at sea for long periods of time. They may also serve as “motherships” that provide transport or shelter for smaller vessels, and sometimes engage in fishing activities directly.

Hook and line is the most commonly used fishing gear, deployed as the primary fishing method by around half of *houri* and *sanbuq* (Figure 2). Nearly three-quarters (73 percent) of fishers who target demersal species and 61 percent of those who target cephalopods fish with hook and line. Long lines are the main fishing method for around 20 percent of *houri* and *sanbuq*, and are the main gear used to target large pelagic fish (used by around 75 percent of the fishers targeting these species). Smaller numbers of *houri* deploy seine nets and cast nets as their main fishing gear (particularly for small pelagic fish) and traps (especially for shrimp and cephalopods). Bottom-set tangle nets and longlines are the main gear used by fishers targeting sharks (Apex Consulting, 2025).

Figure 2: Primary fishing gear used by type of boat (% of boats reporting)



Source: Modified from Apex Consulting (2025).

Knowledge gaps and research priorities

Apex Consulting's recent survey provides a comprehensive snapshot of the type, number, size and location of fishing vessels on the Gulf of Aden coast, the species targeted, and gear used. However, little is known about the average volume, value, and composition of landings originating from different types of vessels (*houri* and *sanbuq*), or about the different size classes of boat within these categories (for example, *houris* of less than 5 m vs. those sized 6–10 m). Moreover, the role of *sanbuq* in supporting fleets of artisanal vessels and transshipping their catch blurs the boundaries between small- and large-scale fishing operations. Instituting **standardized data collection systems to ensure better documentation of catch landed per boat and type of gear used** could help to address information gaps and track changes in fishing effort and productivity (catch per unit effort) over time to facilitate fishery management decisions.

Institutions and governance

The Ministry of Fish Wealth (MFW) is the apex body governing fisheries in Yemen, responsible for policy formulation, legislation, sectoral planning, and export promotion. The GAF, operating under MFW, regulates fisheries activities at the governorate level. There are four regional GAF offices, based in Aden, Al Mahra, Hodeida, and Hadramawt. The Hadramawt GAF office is responsible for fisheries in Hadramawt, Shabwa, and Socotra governorates. GAF offices operate in a partially devolved manner, enforcing regionally specific regulations.

There are 93 active fisheries associations (often also referred to as fisheries cooperatives) across the Gulf of Aden governorates, of which 28 are based in Hadramawt. Nearly half (44 percent) of fishers in these governorates are members of a fisheries association (Apex Consulting 2025). Fisheries associations have proliferated since the introduction of a new fisheries code in 2006, which facilitated their establishment. Historically, there were only 4-6 associations in the entire governorate of Hadramawt. The fragmentation of these associations into a constellation of smaller organizations has resulted in differences in interpretation and enforcement of regulations, and difficulties in coordinating, monitoring, and governing the associations effectively.

When functioning well, fisheries associations represent the interests of their members (that is, fishers), manage landing sites, organize auctions, sell catch to buyers, and collect payment from them. They may also provide member services that include supplying ice, fuel, credit, and other inputs, providing first aid and emergency support, and making payments to the sick or elderly. Associations pay for these functions by levying user fees on members and other fishers who sell fish at the landing sites they manage or who use the services they provide (Apex Consulting, 2025).

Fisheries associations in Hadramawt are considered some of the strongest and most effective in Yemen, but some have experienced financial difficulties since the start of conflict and been unable to fulfil commitments to members, leading to declining membership (The Pragma Corporation, 2019). Many associations outside of Hadramawt are ineffective or defunct. These failed institutions are often replaced by actors such as traders or local leaders who do not provide the social welfare functions offered by effectively run fisheries associations.

Fishers who sell fish at landing sites managed by associations are obliged to pay a 5 percent service fee, of which 1 percent is allocated to the landing site owner, 2 percent to the auctioneer, and 2 percent to the fishery association to cover service provision costs (The Pragma Corporation, 2019). Fisheries association members are generally required to sell fish they catch at the landing site operated by their

association, except when fishing in distant areas that preclude returning to their home base to land fish. However, according to some respondents, some fishers favor bypassing their association when selling fish to avoid paying fees.

Various tensions and conflicts among fisheries governance institutions hamper their effectiveness. GAF offices operate semi-independently and do not always follow directives from the central government. GAF staff are not always paid, which can incentivize rent-seeking behavior and affect their ability to perform key functions such as recordkeeping. The relationship between fisheries associations and the GAF can be complicated, and is sometimes marked by mistrust and lack of cooperation with regard to ownership and management of landing sites, collection of revenues, and the enforcement of regulations (Anon., 2024). Moreover, rivalries exist between some fisheries associations with different political alliances.

Illegal, unreported, and unregulated (IUU) fishing is a major governance issue for Yemen. IUU takes many forms, including fishing by unlicensed foreign vessels in Yemeni waters, fishing by Yemeni vessels in foreign waters, transshipment of catch from foreign waters to Yemen, and violation of fishing regulations by Yemeni vessels operating in Yemeni waters. All instances are believed to be commonplace, reflecting the fragility of states bordering the Gulf of Aden, and a lack of resources and capacity to police maritime boundaries and local nearshore fisheries. According to one key informant, more than 40 percent of the fish landed in Mukalla port may originate from Somalian waters, underlining the scale of this issue. IUU fishing by foreign vessels was widespread prior to the beginning of the conflict in 2014, but is thought to have intensified since then due to the weakened ability to monitor and enforce fishing regulations (Derrick et al., 2023).

Knowledge gaps and research priorities

Fish landing sites are critical pieces of infrastructure and value chain nodes, but there is little fine-grained understanding of the formal and informal institutions that govern their operation, and how these interact to shape quality of service provision, access, and inclusion. In-depth **qualitative studies could diagnose ways of interacting with and supporting these institutions** more effectively and reduce frictions and increase cooperation among them. Mandating the **installation of electronic vessel monitoring systems** (VMS) on all boats large enough to undertake long-distance fishing trips, especially *sanbuq*, which are used for transshipment, would be first step toward greater transparency.

Markets, value chains, and trade

Most fish landed in Yemen is sold via auction at landing sites that are the primary postharvest node in the fish value chain. Many landing sites are publicly owned and may be operated by fisheries associations, GAF, or private actors, while others are privately owned and operated. Landing sites vary widely in terms of their size, and the infrastructure and services available. Many are located on beaches. In Hadramawt, all landing sites have an auction yard, usually an open space with a roof and concrete floor. Around half the landing sites in Hadramawt have access to electricity and water or a functioning filling station selling fuel, but most lack a breakwater or slipway, cold store, or functioning ice plant (Apex Consulting, 2025).

Fishers operating in small boats may retain part of their catch as food or payment, and may sell fish directly to consumers. Fish landed at smaller rural landing sites is often auctioned and trucked to larger urban landing centers for resale. Coastal retail markets are usually located close to landing sites. The

main buyers at larger landing sites include processors, wholesalers, and retailers. Processors in Hadramawt include around 20 factories that do basic processing (e.g., gutting, filleting) and freezing, and 6 tuna canneries, 2 of which commenced operation in 2025. Most of these factories export fish. A further 25 companies in Hadramawt export fish but do not process it (ESDR, 2021).

Wholesalers use insulated pickups and trucks to transport fresh fish from the coast to inland cities such as Seiyun and Terim, supplying fish to retailers located along these routes. Other wholesalers specialize in exporting fish overland to Saudi Arabia and Oman using large refrigerated trucks. ESDR (2021) estimates that one-third of the catch landed in Hadramawt is consumed within the governorate, with the remainder distributed to other Yemeni governorates or exported overseas.

Prior to 2024, large amounts of fish were exported directly to Saudi Arabia through the Al-Wadi'ah road border crossing, but much of this trade has since been redirected through Oman since the suspension of fish imports from Yemen by the Saudi authorities, citing food safety concerns. Estimates of the share of fisheries landings exported from Yemen vary widely, ranging from 25 percent (Ali et al. 2024), to 40–50 percent (Mercy Corps, 2023) to 70–80 percent (SMEPS, 2019), reflecting the paucity of reliable data. The value of exports is thought to have declined since the conflict began, as export of some of the highest value products (such as live fish and fresh yellowfin tuna) depended on airfreight, which is no longer available, but exports of frozen fish and crustaceans are thought to have recovered or increased (Impact Consulting, 2022). The bulk of exports are to countries in the region (Oman, Saudia Arabia, UAE, and Egypt), with a smaller share exported to countries in East and Southeast Asia, often via Oman. Notably, an ad hoc ban on fisheries exports from Yemen, imposed from February to August 2023 with the intent of making fish prices in domestic markets more affordable, reportedly led to high rates of fish spoilage, as local markets were unable to absorb the supply (Mercy Corps, 2023).

Several processed fish products are produced in Yemen for domestic consumption. These include dried shark (*lakham*), which is widely eaten in Hadramawt, dried sardines (*wazef*), and hot smoked tuna (*hanid*). Dried fish are also used as camel and poultry feed. These are products largely absent from the literature, and key informants knew little about the circumstances under which they are produced.

Factories producing fishmeal and fish oil (locally referred to as grinding factories) are thought to have increased in number since 2020. According to key informants, prior to this time, there were only 3 grinding factories, which utilized waste trimmings from tuna canneries, but there are now at least 12. These new factories use small pelagic fish such as sardines as their main input, leading to concerns about overfishing of the main food source for large pelagic fish such as tuna. The grinding factories were ordered to halt operations in 2024 by ministerial decree, but the decision was reportedly reversed some months later due to political pressure.

Knowledge gaps and research priorities

Surprisingly little is known about the characteristics of the domestic market for fish in Yemen. This reflects, in part, a tendency for studies to focus on exports, which are perceived as a source of value creation, thereby underestimating the importance of fish to consumers in southern Yemen. However, despite the attention that exports receive, reliable information on quantities exported is scarce, perhaps reflecting the semi-formal nature of trade at land borders, and the practice of routing exports through third countries to overcome trade restrictions. Future research should **pay closer attention to the domestic trade in fish,** the extent and characteristics of fish processing for domestic markets, fishmeal production, and the establishment of systems for accurately documenting and tracking exports.

Product quality and postharvest losses

Fisheries value chains in Yemen are often said to reward quantity over quality, with a lack of price premiums for catch landed in good condition. Poor postharvest handling practices, limited use of ice, and unhygienic conditions on fishing vessels and at landing sites are widely believed to result in deteriorating product quality and high rates of food loss and waste, eroding the incomes of fishers and other value chain actors and undermining food security (for example, Alkaderi and Fadhl, 2023).

Precise estimates of the magnitude of loss and waste are scarce. Gachoud (2020) reports that loss and waste may account for as much as 19 percent, but does not specify which value chain segments this figure refers to, while ESDR (2021) reports rates of postharvest loss in fishing (30 percent), marketing (20 percent), and exports (5 percent), but does not explain how these figures were estimated. In contrast, some key informants felt that under normal circumstances, rates of physical loss on fishing boats are quite low, but that very high rates of spoilage can occur occasionally, such as when a boat breaks down at sea.

Use of ice on fishing vessels is reported to be low, a situation attributed variously to a lack of functioning ice plants in the vicinity of smaller landing sites, insufficient ice-making capacity during periods of peak demand, the high price of ice produced using power from diesel generators and, most fundamentally, a lack of financial incentives for fishers to keep fish on ice. However, key informants indicated that private sector ice production capacity has increased significantly since 2020, particularly in the vicinity of the larger fishing ports in Hadramawt.

Small *houri* making short fishing trips have little space to carry ice, but return to port within a few hours, meaning that fish can be maintained in reasonable condition by shading it with matts made of palm fronds and spraying it with water—an indigenous fish-handling method. Larger *houri* making trips of up to 24 hours usually have insulated boxes or holds that can carry ice but often opt not to do so because of space constraints and the additional cost and fuel consumption entailed. However, larger boats making multiday trips or transshipping fish do carry ice because it is essential for preventing spoilage.

Processors' quality requirements can influence the use of ice during fishing. Processors sometimes supply fishers with ice produced at their own facilities and deduct the cost from the price of the fish landed. According to one processor interviewed, the company purchases tuna that has been iced and is received in good condition at a standard rate, whereas any fish that has not been iced is purchased at a discounted price. Thus, fishers supplying the processor use ice to avoid having their produce rejected or having to sell at a discount, but are not rewarded with a premium for doing so.

Knowledge gaps and research priorities

The "ice value chain" in Yemen—the production of ice, its distribution and use at different nodes of the fish value chain, and the economics of its production and use—is something of a black box. Increasing the supply of ice and lowering the cost of its production is often thought to be key to improving product quality and reducing loss and waste, and thereby increasing the value generated by Yemen's fisheries. However, little information exists on the scale of existing ice production, the availability and use of ice across value chain nodes and sites, the incentive structures that shape fishers' decisions around ice use, and consumer perceptions and preferences regarding fish quality. **Dedicated studies of the ice value chain in Hadramawt, and experiments in behavioral economics** designed to evaluate fishers' and consumers' willingness to pay for ice could help shed light on these questions.

Fish consumption

Although fish is known to be a key part of the diet in southern Yemen, there has been very little dedicated research exploring fish consumption, in terms of quantity, frequency, geographical distribution, the species and product forms eaten, or its contribution to food and nutrition security. Ecker et al. (2010) found that average fish consumption per capita in Hadramawt was 17.8 kg/year, while national consumption stood at 5.2 kg/year. For comparison, the global average per capita consumption of fish is around 20.7 kg/year (FAO, 2024). However, these figures were derived from statistics on production, net of exports, rather than a dedicated consumption survey.

A survey of 140 fishing households in Hadramawt found that 79 percent of these households consumed fish daily, with an average annual consumption of about 35 kg per capita, although this result is not statistically representative (ESDR, 2021). A recent study by Dey et al. (2026), drawing on data from a nationally representative survey, found that 43 percent of survey respondents in Hadramawt governorate had eaten fish within past 24 hours—more than any other animal-source food. In some districts in Hadramawt, including some inland districts, more than 60 percent of respondents had consumed fish in the past 24 hours, indicating both very widespread consumption and the presence of robust domestic supply chains moving fish from the coast to the interior. Together these findings hint that fish consumption in Hadramawt may be greater than previously recognized.

Knowledge gaps and research priorities

Little is known about how much fish is eaten in Yemen, in what locations, of which species, in which product forms, how frequently, and at what prices, or about the importance of fish as a source of protein and micronutrients relative to other food groups. **A dedicated consumption survey based on a statistically representative sample** could answer many of these questions, making it easier to integrate patterns of demand and nutrition implications into decisions concerning the regulation or management of fisheries.

Conclusions

The preceding synthesis blended accounts drawn from the prior literature—including numerous unpublished diagnostic reports prepared for development partners—with observations from 14 key informant interviews to provide a broad lay-of-the-land view of fisheries in Hadramawt. We addressed knowledge in six key areas: (1) target species, stocks and landings, (2) fishing vessels and fishing gear, (3) institutions and governance, (4) markets, value chains, and trade, (5) product quality and postharvest loss, and (6) fish consumption.

This exercise underlines the data deficient nature of Yemen's fisheries, for which reliable information on even the most basic indictors is scarce. A recent study commissioned for the World Bank (Apex Consulting, 2025) is a welcome exception, providing wealth of important empirical information that can be used to guide future development programming and policy; this study stands as an example of how valuable robust, large-scale data collection efforts can be.

Based on the synthesis of this information, this note has made a set of recommendations—listed on the first page, and described in greater detail in the related sections—that highlight key areas where further research is needed to address knowledge gaps and strengthen development programing, policies, governance, and management in support of more sustainable fisheries, livelihoods, and nutrition.

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