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Policy Paper

FISHERIES IN FRAGILE CONTEXTS: A PRO-POOR AND RESILIENCE FOCUSED POLICY FRAMEWORK FOR YEMEN

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About this Paper

This policy paper is an output of the OASIS – Onward Alliance for Stability and Inclusive Solutions project, implemented by DeepRoot Consulting with the financial support of the European Union.

The paper examines Yemen's fisheries sector through a pro-poor and resilience-focused lens, offering practical policy recommendations suitable for fragile and conflict-affected contexts.

01 Introduction

There is a growing global enthusiasm for the Blue Economy as an avenue for development and economic growth with significant potential. The World Bank defines the Blue Economy as the "sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem growth".[1] The Blue Economy is a broad field and is concerned with different types of activities including fisheries, maritime transport, tourism, and energy production.[2] This policy paper focuses on the fisheries sector in Yemen, specifically marine fisheries, given its historical relevance, socioeconomic significance and potential for addressing some of Yemen's development needs.

Yemen has a geographical advantage endowing it with extensive coastlines and access to rich marine environments. At the same time, Yemen faces significant development challenges including the prevalence of multi-dimensional poverty, food insecurity, and lack of employment opportunities, all of which have been exacerbated by the protracted conflict since 2014. These pressures are further heightened by reductions in international aid, and Yemen's vulnerability and limited preparedness to climate change. In this context, the potential of a sector to contribute to livelihoods, food security, and economic resilience under these conditions deserves attention.

Fisheries are highlighted as a sector with potential for the creation of employment opportunities, poverty reduction and supporting food security. Many mainstream fisheries development strategies assume political and institutional stability. In Yemen, such conditions are currently fragile and unlikely to materialize in the near to medium future. As a result, policies that rely on centralized governance, institutional reforms and enforcement-heavy interventions risk being impractical and ineffective.

Fisheries in Yemen are dominated by artisanal, small-scale fishing over large-scale or industrial fishing. Small scale fishers tend to rely on fishing as a primary source of income and often experience high levels of socioeconomic vulnerability. This is even more critical in Yemen, where alternative and formal employment opportunities are limited and multi-dimensional poverty is prevalent. In Yemen, beyond their economic contribution, fisheries function as a resilience system and a poverty prevention buffer.

As such, this paper examines the challenges facing Yemen's fisheries sector through a welfare-centred and pro-poor lens and proposes strategies that can function under the existing realities while prioritizing livelihoods, resilience and poverty prevention.

[1] World Bank, *What Is the Blue Economy?* (infographic, June 6, 2017), World Bank.
[2] *Ibid.*

02 Yemen's Fisheries Sector: Structure and Realities

Advantaged by a strategic location providing access to a 2,520 km-long coastline and rich and highly productive marine environments, fisheries have been a significant source of national income and subsistence for Yemenis.[3] Specifically it is marine fisheries that have dominated this sector while aquaculture remains limited in size and prevalence.[4] Between 2000 and 2010, the market value of this sector was reportedly estimated to be 188 million USD.[5] Prior to the eruption of conflict in 2014, the fisheries sector represented Yemen's third largest agricultural sector.[6] It also represented the second largest export share after petroleum products, with Yemen's fihseries reaching over 50 countries, contributing about 3% to GDP.[7]

Seafood represents a key part of the Yemeni diet in coastal communities; however, consumption is low comparatively for inland communities apart from some major urban centres accessible via transport routes.[8] The countrywide average yearly consumption is below 5 kg per capita, significantly lower than the 20.5 kg world average reported in 2019.[9]

Fishing activities in Yemen are traditional and low technology. Most of Yemen's fish production comes from artisanal fishing, where small-scale fishers account for as much as 90% of this sector.[10] Consequently, fishing activities are characterized by smaller fishing boats with crews between 2 –10 people, shorter trips often between a day or overnight (if the trips are longer, they do not exceed 10 days), reliance on simple equipment, lower capital, dependence on seasonality and on value chain intermediaries, and ultimately lower production and lower income.[11]

As for industrial fleets, there are no publicly owned fisheries operations.[12] According to dated FAO data, in 1998 there was 23 privately owned industrial fishing companies fishing in Yemeni waters with approximately 131 boats.[13] Due to limited data however, the current size and operations of industrial fleets cannot be confirmed.

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[3] World Bank, *Sustainable Fishery Development in the Red Sea and Gulf of Aden (SFISH) (P178143)*, Project Information Document (PID), appraisal stage, Report No. PIDA33493 (Washington, DC: World Bank, April 20, 2022).

[4] *Developing Yemen's Fishing Industry*, policy brief no. 19 (Rethinking Yemen's Economy initiative, March 31, 2020), Rethinking Yemen's Economy.

[5] United Nations Development Programme (UNDP), *Fishery Value Chain: A Market Study (Yemen: UNDP ERRY Joint Programme, July, 2020).*

[6] World Bank, SFISH Project Information Document.

[7] *Ibid.*

[8] Angelo Bonfiglioli and Khaled Ibrahim Hariri, *Small-scale Fisheries in Yemen: Social Assessment and Development Prospects* (Washington, DC: World Bank, December 1, 2004).

[9] Food and Agriculture Organization of the United Nations (FAO), *The State of World Fisheries and Aquaculture 2022: Consumption of Aquatic Foods,* FAO Fisheries and Aquaculture Report (Rome: FAO, 2022).

[10] UNDP, *Fishery Value Chain.*

[11] Bonfiglioli and Hariri, *Small-scale Fisheries in Yemen.*

[12] *Developing Yemen's Fishing Industry* (Rethinking Yemen's Economy, 2020).

[13] Food and Agriculture Organization of the United Nations (FAO), *Fishery Country Profile: Republic of Yemen* (Rome: FAO, February 2002).

Prior to the conflict, the fisheries sector provided job opportunities for more than 500,000 individuals in turn supporting the livelihood of 1.7 million people.[14] 70,000 artisanal fishermen are concentrated along the southern coastline according to some sources.[15] For many working in this industry, fishing represents their primary source of income.[16]

Fishers typically sell their catch at auction halls or fish markets to traders, or to Fishery Associations.[17] Fishery Associations are membership-based registered associations under Yemeni Law that mediate auctioning activities at landing sites between fishers, and buyers such as wholesalers, retailers, or export companies, although the degree of their functions and authority varies by location.[18]

Most of the fish sold is unprocessed and therefore the majority of employment activities, over **80% of jobs**, are concentrated in the upstream of the value chain in labour-intensive and least remunerative activities, including fishing, auctioning, transport to local markets and small-scale trading.[19]

Prior to 2020, governance of the fisheries sector was the responsibility of the Ministry of Fish Wealth (MFW) which was in charge of policy, issuing licenses and protection of marine resources.[20] In December 2020, however, the Ministry of Agriculture and Irrigation merged with the Ministry of Fish Wealth forming one entity (MoAIF).[21] It is important to note that even before the eruption of conflict in 2014, Yemen's Ministry of Fish Wealth was affected by longstanding weaknesses and limited capacity, which were further exacerbated by years of conflict and decline in institutional capacity.[22]

Overall, Yemen's fisheries sector remains a significant source of livelihoods and a modest source of national income. However, it is constrained by governance weaknesses, low technology and limited processing, all of which have been exacerbated by years of political instability and prolonged conflict.

[14] World Bank, *SFISH Project Information Document*

[15] *Ibid.*

[16] UNDP, *Fishery Value Chain*

[17] *Ibid.*

[18] *Ibid.*

[19] World Bank, *SFISH Project Information Document.*

[20] PERSGA/GEF, *Status of the Living Marine Resources in the Red Sea and Gulf of Aden and Their Management*, PERSGA Technical Series No. 4 (Jeddah: PERSGA, 2003), in Arabic.

[21] Abdilahi Ali, Hélène Donnat, Saleh Fadhl, Amna Mahmood, Sanjana Srivastav, and Edward P. (Ned) White, *Empowering Yemen's Fisheries: A Strategy for Reform through Public-Private Partnerships*, Policy Brief YEM-23120 (May 2025).

[22] PERSGA/GEF, *Status of the Living Marine Resources in the Red Sea and Gulf of Aden.*

03 Key Challenges and Constraints

Even prior to the eruption of conflict in 2014, Yemen's fisheries sector faced an array of constraining factors and capacity limitations that have only been exacerbated since. This section is concerned with the challenges that continue to face Yemen's fisheries, including those sustained by the protracted conflict. Additionally, and more importantly, given the developmental challenges in Yemen, it is recognized that the development of the fisheries sector not only serves economic objectives but also post-conflict recovery goals. Therefore, this section will focus not only on the constraints facing the sector in general but also on the challenges confronting the small-scale fisher communities, which dominate this sector and are highly dependent on it.

Governance & Institutional Fragmentation

Despite the significance of fisheries to Yemen's economy and welfare, the management of marine resources was constrained by an array of chronic structural and capacity challenges even before the conflict erupted. These included limited operating funding for the Ministry of Fish Wealth and research bodies, shortages of trained staff and low pay, outdated or inadequate equipment, and persistent gaps in marine stock assessments.[23] Monitoring, control, and addressing violations in Yemen's Exclusive Economic Zone remained a key challenge, as the country lacked sufficient fisheries surveillance, weak state control, and any vessel monitoring systems or aerial surveillance. [24]

There was also a high likelihood that licenses were issued without sufficient understanding of existing stocks as no reliable assessments of fish catches were conducted since 1992, increasing the risk of fisheries mismanagement.[25]

Furthermore, the aftermath of the conflict and loss of territorial control has resulted in the creation of parallel authorities and governance incoherence. The internationally recognized government relocated from Sana'a to Aden, maintaining the Ministry of Agriculture, Irrigation and Fisheries under its control, while in Sana'a the de facto authority controls the Ministry of Fish Wealth.

The de facto authority in Sana'a continues to control Yemen's Red Sea coastline in the Tihama region, from the Saudi border through Al-Hudaydah governorate, including Yemen's

[23] PERSGA/GEF, *Status of the Living Marine Resources in the Red Sea and Gulf of Aden.*

[24] Lo Persson, Alasdair Lindop, Sarah Harper, Kyrstn Zylich, and Dirk Zeller, "Failed State: Reconstruction of Domestic Fisheries Catches in Somalia, 1950–2010," *in Fisheries Catch Reconstructions in the Western Indian Ocean, 1950–2010,* ed. Frédéric Le Manach and Daniel Pauly, Fisheries Centre Research Reports 23, no. 2 (Vancouver: Fisheries Centre, University of British Columbia, 2015), 111–127.

[25] *Developing Yemen's Fishing Industry* (Rethinking Yemen's Economy, 2020).

largest Red Sea port, Al-Hudaydah.[26] Meanwhile, the internationally recognized government control of Yemen southern coastline along the Gulf of Aden and the Arabian Sea is increasingly overtaken by the Southern Transition Council.[27] Fisheries management coordination is minimal, if not entirely absent, given this political divide. Consequently, any comprehensive national fisheries policy remains on hold until a political settlement is reached.[28] This fragmentation further compounds policy incoherence, blurs lines of authority, and weakens enforcement capacity.

These governance and institutional challenges demonstrate the significant constraints facing the effective management of Yemen's marine resources and the substantial need for practical and context-specific solutions.

Knowledge and Data Gaps

Effective and sustainable management of fisheries is heavily reliant on understanding the status of fish stocks.[29] This need is growing significantly considering the impact of climate change on species diversity, migration patterns, and abundance.[30] Fisheries' sustainability in Yemen is difficult to assess. Reliable data is limited or non-existent, with the last comprehensive assessment of fish stocks completed more than 30 years ago.[31] As a result, there is significant uncertainty about the status of marine species and their changes over time.

The eruption of conflict in 2014 amplified the existing challenges and led to the collapse of the limited fisheries data collection and monitoring.[32] National data for fish catches effectively stopped after 2014, resulting in significant knowledge gaps and notable decreases in the already limited number of peer-reviewed research and up-to-date analyses on Yemen's fisheries.[33] The limited publications on Yemen's fisheries tend to rely on pre-war and reconstructed data.[34] Much of the existing literature on fisheries management and policies tends to be largely descriptive, including the contributions of this paper. Much of the existing stock is unknown, and any attempt at assessments must heavily rely on outdated or proxy data.

[26] Armed Conflict Location & Event Data Project (ACLED), West Coast Yemen Regional Profile, ACLED.

[27] Rabia Ali, "*Yemen Conflict: Who Controls What Areas?*" Anadolu Agency, December 17, 2025.

[28] Republic of Yemen, Ministry of Fish Wealth, *National Fisheries Strategy (2012–2025)* (June 2012).

[29] Organisation for Economic Co operation and Development (OECD), Fisheries Sustainability, OECD.

[30] OECD, Fisheries Sustainability.

[31] Developing Yemen's Fishing Industry (Rethinking Yemen's Economy, 2020).

[32] Cal Costa, Hélène Donnat Gonzalez Holguera, Saleh Fadhl, Amna Mahmood, and Austin L. Wright, Yemen Fisheries and Climate Change, Final Report YEM-24282 (State Fragility Initiative, October 2025).

[33] Costa et al., Yemen Fisheries and Climate Change.

[34] *Ibid.*

Furthermore, the division of territorial control resulted in the loss of access to historical knowledge and data, as well as the ability to track fish stocks along much of Yemen's coastlines on the Red Sea. For example, access to fisheries offices in Al-Hudaydah was lost after 2015, resulting in the loss of access to any catch or stock assessments after that year.[35] Given that fisheries are shared resources with migratory patterns, Yemen's limited data also impacts the ability to conduct accurate regional assessments for migratory species.

These persistent data gaps not only undermine sustainable fisheries management in Yemen but also limits the ability to design context-appropriate, effective and evidence-based policies to support livelihoods, food security and sustainable natural resources management and economic development.

[35] Ibid.

Socio-economic Vulnerability of Small-scale Fishers

The majority of fishing production in Yemen is led by small-scale fishers, representing over **79%** of total fish production.[36] Most existing literature suggests that small-scale fishers tend to be poor, unskilled workers with limited financial resources.[37] This marginalization is further amplified in Yemen given the state of development prior to the conflict and its protraction after 2014. While comprehensive studies of fisher communities are lacking, some localized assessments support these observations.

Small-scale fishing is a key source of income for households in coastal and rural communities.[38] For most fishers in Yemen, it is their primary livelihood.[39] The higher dependence of poorer populations on fishing likely reflects the scarcity of alternative income opportunities, as fishing offers a relatively low barrier to entry for earning a living.[40] Although exact figures are unavailable, some reports note a significant increase in the number of fishers in Yemen in recent years, although the contributing factors have not been fully assessed.[41]

[36] UNDP, *Fishery Value Chain.*

[37] C. Béné, *Small-scale Fisheries: Assessing Their Contribution to Rural Livelihoods in Developing Countries*, FAO Fisheries Circular No. 1008 (Rome: FAO, 2006), 46 pp.

[38] Food and Agriculture Organization of the United Nations (FAO) and WorldFish Center, *Small Scale Capture Fisheries – A Global Overview with Emphasis on Developing Countries: A Preliminary Report of the Big Numbers Project*, Sponsored by PROFISH – World Bank (Rome: FAO, 2008).

[39] UNDP, *Fishery Value Chain.*

[40] Béné, *Small-scale Fisheries.*

[41] World Bank, *Sustainable Fisheries for Yemen's Resilience*, World Bank feature, November 20, 2025.

Small-scale fishers are economically and politically marginalized and particularly vulnerable to social and ecological changes.[42] They tend to be more vulnerable to disturbances with limited capacity to cope.[43] They live in remote areas with high rates of illiteracy and limited organizational development, and engage in one of the most hazardous and economically risky occupations, with high exposure to weather events and macroeconomic fluctuations, such as fuel or fish price changes. [44],[45]

While specific studies on Yemeni fisher communities are limited, national data indicate widespread deprivation and multidimensional poverty prevalence, which is likely more acute in rural and coastal areas. It is important to recognize that the causes of poverty in fishing communities are not solely due to lower catches but relate to broader socio-economic conditions.[46] High rates of poverty can exist even in communities with substantial catches if access to public services and institutional support is limited.[47] As such, the vulnerability of fishing communities in Yemen reflects broader economic, political, and institutional underdevelopment in the areas where they live. Beyond fisheries-specific interventions, this underscores the importance of complementary development initiatives targeting wider structural challenges in these regions.

[42] Ana Carolina Esteves Dias et al., "From Vulnerability to Viability: A Situational Analysis of Small Scale Fisheries in Asia and Africa," *Marine Policy* 155 (2023).

[43] *Ibid.*

[44] FAO and WorldFish Center, *Small Scale Capture Fisheries.*

[45] Béné, *Small-scale Fisheries.*

[46] Béné, *Small-scale Fisheries.*

[47] *Ibid.*

Infrastructure Deficits & Value Chain Fragility

Yemen's fisheries production, both locally and regionally, is hindered by significant structural deficits. These include underdeveloped landing sites and processing facilities, limited port and dock infrastructure, precarious electricity access, and insufficient cold storage capacity.[48]

The infrastructure challenges extend beyond landing sites and are reinforced by spatial exclusion due to a limited and deteriorated road network, illegal tolls, and various check points.[49] The protracted conflict has further degraded the already limited value chain facilities, although multiple internationally funded projects are restoring the capacity of a few sites. Nevertheless, the continued lack of accredited facilities hinders broader market access.[50]

These deficits reinforce the fisheries value chain's reliance on numerous intermediaries. Most fishers operate individually and lack access to cold storage, a situation worsened by unreliable electricity. This creates space for wholesalers with refrigeration and transport capacity to act as additional intermediaries between fishery associations and other wholesalers or retailers.[51] As a result, the value chain is long and intermediary-heavy, raising prices for the final consumer while reducing the income that reaches fishers.

Illegal, Unregulated, and Unreported Fishing

Illegal, Unregulated, and Unreported (IUU) fishing is a global concern for both domestic and international waters.[52] Countries with limited monitoring and enforcement capacity, like Yemen, tend to be significantly vulnerable to IUU.[53] Estimating the exact magnitude of this activity in Yemeni waters is difficult due to its illegal nature, but Yemen has consistently been identified as a high-risk area.[54]

The Global Fishing Index signalled Yemen's mediocre performance in 2019 and 2021 in combating IUU in its waters.[55] According to the IUU Fishing Index, Yemen ranks among the lowest ten countries in terms of vulnerability, prevalence, and response. Here, vulnerability refers to the conditions that expose a country to illegal fishing, prevalence demonstrates how widespread illegal fishing is, and response refers to the strength of systems to prevent and address these activities.

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[48] *Developing Yemen's Fishing Industry* (Rethinking Yemen's Economy, 2020).

[49] Casey Coombs and Salah Ali Salah, *The War on Yemen's* Roads (Sana'a Center for Strategic Studies, January 16, 2023).

[50] *Developing Yemen's Fishing Industry* (Rethinking Yemen's Economy, 2020).

[51] UNDP, *Fishery Value Chain.*

[52] Dias et al., "From Vulnerability to Viability"

[53] Food and Agriculture Organization of the United Nations (FAO), *Sustainable Fisheries Management* and Aquaculture Development, FAO Regional Office for the Near East and North Africa.

[54] J. Spijkers, J.H. Ford, C. Wilcox, S. Pascoe, E. Drew, G. Ferraro, B. Jin, S. Wan, M. Mackay, and C. Paris, *Estimating Illegal Fishing Across the Indian Ocean* (CSIRO, Australia, 2023).

[55] *Ibid.*

IUU fishing leads to a variety of environmental concerns, including overexploitation, damage to marine ecosystems, and biodiversity loss. While its full impact is difficult to quantify, IUU also leads to significant economic losses. One study estimated that IUU in the Indian Ocean accounted for **approximately 27% of total landed volume**, equating to roughly **1.3 billion USD** in value.[56]

IUU activities are not limited to industrial fishing and can also include small-scale fishing. Illegal practices observed include the use of destructive gear and techniques, fishing during banned seasons, exceeding quotas, or catching prohibited species.[57] It is important to note that, especially among small-scale fishers, the interplay of climate change stresses, weak governance, and existing vulnerabilities further incentivize IUU activities.

Studies show that IUU by small-scale fishers is often driven by scarcity of alternative livelihoods, highlighting that focusing solely on monitoring and enforcement is unlikely to be sufficient.[58] Addressing IUU effectively requires not only strengthening monitoring and enforcement activities, but also the need to tackle the broader conditions incentivizing these behaviours among small-scale-fishers in environments with limited livelihood opportunities.

Climate and Environmental Stressors

Climate change presents an additional layer of risk and complexity for Yemeni fisheries. According to the Intergovernmental Panel on Climate Change, global fisheries catches are forecasted to decline by as much as **24%** by the end of the century, with uneven impacts across regions.[59]

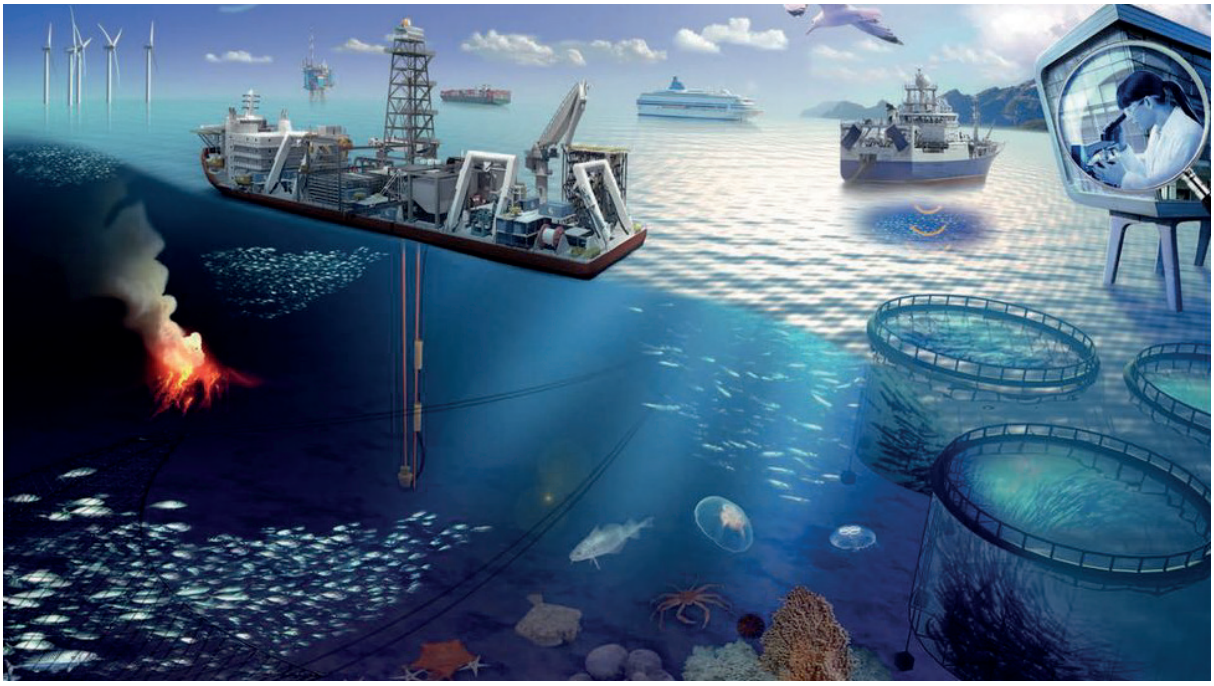
Understanding trends in Yemen's fish stocks is constrained by limited data and monitoring. Comprehensive assessments have not been conducted for decades, and the protracted conflict has further undermined the already limited monitoring capacity. In the absence of local data, some regional assessments from Saudi Arabia and Oman provide proxy indicators, showing reductions or plateauing in catches since 2010.[60] While these results cannot be directly extrapolated to Yemen, the shared marine ecosystems suggest that catches in Yemen are likely experiencing similar trends.[61]

Climate change places additional strains on an already fragile system, altering marine ecosystems, species abundance, and distribution. Globally, the distribution of fish stocks is expected to shift, with one in four transboundary stocks projected to migrate by 2030.[62] It is expected that higher-latitude areas will see an increase in catches while most areas,

[56] *Ibid.*
[57] *Ibid.*
[58] *Ibid.*
[59] OECD, *Fisheries Sustainability.*
[60] Costa et al., *Yemen Fisheries and Climate Change.*
[61] *Ibid.*
[62] OECD, *Fisheries Sustainability.*

especially tropical regions, will see reductions.[63] Anecdotal accounts from Yemen further suggest that fishers in several coastal communities are increasingly traveling further offshore to achieve similar catches, indicating ecological changes that have yet to be systematically documented. This increases the difficulty of fisheries management and highlights the need for regional cooperation.

These changes heighten the vulnerability of small-scale fishers, forcing them to venture further into the sea and increasing occupational risks. These risks are compounded by existing vulnerabilities in Yemen, including limited access to up-to-date weather information, safety equipment, rescue operations, and alternative income sources. As catches shrink and become more variable, unsustainable fishing practices may be incentivized, particularly given Yemen's limited monitoring and enforcement capacity.[64]



[63] OECD, *Fisheries Sustainability.*

[64] Abdulmalik al Nomari, "*DIY Artificial Reefs Are Boosting Fish Numbers in Yemen — But There's a Catch,*" *The Guardian*, July 19, 2024.

04 Policy Options and Recommendations

While there is space to propose policy options for the growth and expansion of Yemen's fisheries sector, many growth-oriented interventions require institutional stability, which is currently undermined in Yemen. While such stability remains a necessity and an ultimate goal, the following recommendations assume that institutional instability and fragmentation will continue in the near to medium term. Therefore, the recommendations focus on reforms that can function under the current conditions of divided governance and limited state capacity.

Additionally, given the broader development and recovery needs in Yemen, as well as the predominance of small-scale fisheries in this sector and their significance for poverty alleviation, the following recommendations consider the welfare and resilience of fishers as a cornerstone of fisheries sector development.

Support Fisheries Governance that can Function under Fragmentation

Sustainable fisheries management and enforcement is highly reliant on strong institutional capacity and national and regional cooperation.[65] However, the persistence of institutional instability and fragmentation of governance of Yemeni coastlines make comprehensive national reforms at this time likely infeasible. Governance reforms are critical for Yemen's long-term stability and development; however, waiting for broader institutional reform to develop Yemeni fisheries is not a viable option and would depend on interventions beyond what this sector can offer. What is arguably more viable in the Yemeni context is a focus on local and decentralized governance interventions.

Often, local bodies closer to natural resources and the users of those environments are better positioned to govern their use effectively, efficiently, and democratically.[66] The continuation and survivability of small-scale fishing in Yemen and decentralized forms of organization, despite the protracted conflict, signal inherent strengths of local resource management.[67] Additionally, the role that fisheries have played as an enduring source of livelihoods demonstrate that natural resources collective action management systems that functioned before conflicts, dampen the consequence of conflicts on livelihoods.[68]

[65] FAO, *Sustainable Fisheries Management and Aquaculture Development.*

[66] Blake D. Ratner, Ruth Meinzen-Dick, Jon Hellin, Everisto Mapedza, Jon Unruh, Wouter Veening, Eric Haglund, Candace May, and Carl Bruch, "Addressing Conflict through Collective Action in Natural Resource Management," *International Journal of the Commons* 11, no. 2 (2017): 877–906.

[67] Béné, *Small-scale Fisheries.*

[68] Ratner et al., "Addressing Conflict through Collective Action"

Focusing on the empowerment and capacity building of local institutions - such as Fisheries Associations and Fishing Cooperatives - and the delegation of functions such as license issuance and enforcement activities can support continued operations despite persistent conflict and governance fragmentation.

The predominance of small-scale fishing in Yemen also presents unique opportunities for political empowerment, particularly for poor and vulnerable communities such as small-scale fishers.[69] Collective resource management in this sector presents opportunities to strengthen fishers' bargaining power and support broader political empowerment.[70] Investments in democratic local resource management institutions can help prevent resource conflicts and support livelihood recovery in post-conflict contexts and ensure governance continuity despite ongoing instability.[71]

Build "Good-enough" Fisheries Data

Sustainable and effective fisheries management is highly reliant on a good understanding of existing fish stocks, a need further amplified by the impacts of climate change on marine life.[72] Developing context-specific and effective strategies that maintain livelihoods and protect the health of marine biodiversity in Yemen is highly dependent on timely scientific information.[73]

While traditional stock assessments would be ideal, their implementation in Yemen may be unrealistic. Stock assessments require significant capacity and can be expensive, making regular and comprehensive assessments challenging to implement. Beyond the challenge of data collection, the effective operationalization of this data - including assessments, enforcement, and coordination - remains constrained by limited capacity and institutional fragmentation. Where capacity and funding exist for traditional assessments, prioritizing high-value or overexploited species can offer a cost-effective and more targeted approach.

More realistically, for the Yemeni context, focusing on low-cost and low-data methodologies can provide a feasible option under existing constraints such as utilizing catch-only stock assessment, or length-based indicators such as the percentage of grown fish to estimate stock depletion rates.[74] Furthermore, the utilization of proxy data from regional neighbours with shared migratory species, such as Saudi Arabia and Oman, might offer - albeit imperfect - an alternative where direct Yemen-specific data are not available, still allowing for more informed resource management decisions.

[69] Béné, Small-scale Fisheries.

[70] *Ibid.*

[71] Ratner et al., "Addressing Conflict through Collective Action"

[72] OECD, *Fisheries Sustainability.*

[73] *Ibid.*

[74] National Oceanic and Atmospheric Administration (NOAA) Fisheries, *Stock Assessment Model Descriptions*, NOAA Fisheries.

Building the knowledge base on Yemeni fisheries is also important. Much of the existing literature on this sector is largely descriptive, with very limited peer-reviewed studies. Investing in the marine knowledge and institutional capacity of local universities through training, research partnerships, and regional collaboration could gradually build the fisheries knowledge base in the absence of national compressive plans. Additionally, the loss of significant portions of data and knowledge following 2014, combined with fragmentation of control over Yemeni coastlines, highlights the need for discussions on marine data access and co-custodianship with local educational institutions. Both measures rely on universities as key actors and area of investment to strengthen research capacity, manage data and support local resource management.

These approaches combined – prioritizing feasible stock assessment, utilizing proxy data, and investing in university-based research and capacity - could offer a realistic and feasible foundation for data-informed marine resource management under the existing constraints.

Treat Fisheries as a Livelihood and Resilience System

Small-scale fishing dominates Yemen's fisheries sector, with most artisanal fishers relying on it as their primary source of income. This aligns with broader trends in developing countries, where estimates suggest that over 90% of those working in fisheries depend on small-scale fishing for their main livelihood.[75]

At a macro level, the contribution of fisheries to Yemen's national GDP is small compared to other sectors. However, its contribution at a micro level, especially in coastal communities and to livelihood support is significant.[76] Many are able to enter and exit this sector with fewer barriers and lower cost.[77] In fragile economies with high uncertainty and limited formal employment opportunities, small-scale fisheries provide vulnerable populations with essential alternatives to buffer against economic shocks.[78]

Focusing primarily on economic output and growth-oriented interventions in an environment vulnerable to elite capture risks consolidating the benefits of fisheries among a narrow set of actors, further marginalizing small-scale fishers. High levels of food insecurity in Yemen also mean that fisheries trade policies must carefully weigh the trade-off between protecting domestic food security and pursuing international trade. Without robust mechanisms for fiscal redistribution, export-oriented strategies may accrue gains to a small group while undermining food security and marginalizing artisanal fishers.

This highlights the need to treat fisheries as an integrated system of resilience and poverty prevention. Policies that prioritize economic output without recognizing fisheries' social, employment-buffering, and safety-net functions risk increasing vulnerabilities among the

[75] Béné, *Small-scale Fisheries.*

[76] *Ibid.*

[77] *Ibid.*

[78] *Ibid.*

most dependent communities. Treating fisheries as an integral system for community resilience and livelihood security is essential to ensure that development interventions both protect vulnerable populations and strengthen Yemen's economic stability.

Focus Fisheries Investment on Post-harvest Infrastructure and Market Access

There is a clear need for infrastructure rehabilitation across Yemen's fisheries sector, including landing sites, auction halls, cold storage facilities, as well as enabling infrastructure such as road connectivity and electricity access. Given constrained funding and competing reconstruction priorities, fisheries investments can focus on post-harvest infrastructure and market access rather than expansion of fishing capacity.

Focusing on post-harvest operations offers a pragmatic way to maximize the value of the existing catch, improving incomes and food quality without introducing new pressures on uncertain fish stocks. Improved handling, hygienic practices, and access to cold storage facilities can reduce post-harvest losses and increase the value of existing catches. This aligns with donor-led projects that focus on rehabilitating post-harvest facilities and providing training and capacity building in this area.

Weak post-harvest infrastructure contributes to the fisheries value chain being notably intermediary-heavy. This results in fishermen capturing the lowest profits in the chain despite their production role, while consumers face higher prices. Fisheries cooperatives, or where they exist formally, Fisheries Associations, can provide a tangible institutional entry point to address this imbalance. Investments that strengthen these local organizations - through capacity building, shared cold storage, and collective transport - can reduce intermediary dependence and improve fishers' bargaining power without requiring large-scale formalization or state-led enforcement.

Additionally, while partnerships and private investment have been suggested as potential solutions for some value chain gaps, such approaches must be considered carefully in Yemen's fragile context. There is significant untapped potential in this sector, and investments are one way to unlock it. However, investments that concentrate assets or decision-making power risk exacerbating structural and economic inequalities, further marginalizing small-scale fishers. Priority should be given to models that support small- and medium-sized enterprises and shared ownership, ensuring that gains lead to higher incomes for fishers, more affordable food for local consumers, and greater resilience across the value chain.

Tackle IUU Fishing as Two Different Problems, and Address thorough Differentiated Approaches

IUU has been a long-standing issue in Yemen, even before the conflict started, and has been worsened by Yemen's limited monitoring and enforcement capacity. IUU is not a single phenomenon in Yemen. It can be perpetuated by industrial or large-scale fishing and can also be carried out by small-scale fisheries, with each driven by different incentives. Recognizing this distinction is important, as policies that fail to differentiate between external IUU and small-scale, livelihood-driven IUU risk introducing regressive measures.

Large-scale and industrial IUU may be driven by market demand, undermining Yemen's marine resources and national sovereignty. On the other hand, small-scale IUU tends to be driven by livelihood precarity, reduced catches, and a lack of alternative income sources. Treating both the same way, especially with enforcement-heavy interventions, risks deepening poverty and penalizing vulnerable fishers.

Addressing IUU in Yemen requires a nuanced, differentiated approach that recognizes the differences between the incentives driving industrial-scale and small-scale-livelihood-driven IUU. External IUU requires enforcement, regional cooperation, and information sharing, while small-scale IUU demands fisher engagement, education, knowledge sharing, and support for alternative livelihoods. By tailoring interventions to these underlying causes, Yemen can protect its marine resources while safeguarding the economic resilience of its small-scale fishers.

05 Conclusion

Yemen's fisheries are more than an economic sector; it is an enduring way of life, creating critical livelihood opportunities, food security and a resilience system for many Yemenis under conditions of protracted conflict and widespread multi-dimensional poverty. While Yemen has been advantaged with long coastlines and access to abundant marine life, it remains constrained by persistent and compounding structural issues – political instability, institutional fragmentation, weak infrastructure, significant knowledge gaps, IUU and weak enforcement capacity and growing environmental stressors – all of which have been exacerbated by the eruption of conflict in 2014 and which are at risk of being further amplified by climate change.

Small-scale fisheries, which dominate Yemen fisheries, are particularly vulnerable but also strategically significant. They provide a buffer from livelihood shocks, sustain local economies and prevent deeper poverty. Fisheries development policies that centre economic growth alone, especially in a fragile political and institutional landscape as well as in a sector highly dependent on effective natural resource management, risk marginalizing small-scale fishers, increasing the prevalence of poverty and undermining food security.

Policy responses must be realistic and practical, recognizing that many of the existing limitations and constraints facing Yemen are likely to persist in the near to medium-term future. As such, development interventions must give appropriate weight to the role Yemeni fisheries have on poverty reduction, food security, livelihood protection, and social resilience. Policies should focus on strengthening community resilience, enabling decentralized governance, supporting post-harvest infrastructure, and building practical and feasible fisheries knowledge to ensure sustainable management of marine resources.

By centring interventions on the welfare of fishing communities, equitable access to resources, and adaptive management to current constraints and the risk of climate change, Yemen can ensure that fisheries continue to sustain livelihoods, support post-conflict recovery while meaningfully supporting Yemen's national economy.

06

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