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Traditional Fishing and Climate Justice on Yemen's West Coast:

Adaptation Challenges in a Conflict Context



Fishers prepare their boats at Al-Qataba landing site in Al-Khawkhah, getting ready to head out to

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Executive Summary

This paper examines the challenges facing traditional fishing communities on Yemen's west coast in the context of climate change and explores how its impacts interact with conflict, economic pressures, and weak institutions. Although Yemen contributes very little to global greenhouse gas emissions, its coastal communities are increasingly exposed to climate impacts while lacking the resources and protection needed to adapt, safeguard their rights, and sustain their livelihoods.

The paper draws on a review of scientific, official, and human rights studies and reports, as well as nine qualitative interviews with traditional fishers, women from fishing families, and community and human rights activists in the Al-Mokha and Dhubab areas.

The analysis shows that rising sea temperatures, changes in the marine environment, shifting wind seasons, and more frequent extreme weather events are placing increasing pressure on traditional fishing. These pressures coincide with fishers' observations of declining catches of certain species near the coast, the need to travel longer distances to fishing grounds, and increased risks during fishing trips. However, the paper does not attribute all these changes conclusively to climate change, given the lack of scientific data specific to Yemen's west coast and the influence of other contributing factors.

The analysis also reveals that conflict has intensified these risks and weakened fishers' ability to adapt. This has occurred through restrictions on access to the sea, rising fuel and fishing equipment costs, damage to infrastructure, and inadequate early warning systems and fisheries management. At the same time, coastal communities remain largely excluded from meaningful participation in the policies and decisions affecting their resources and livelihoods.

Accordingly, the paper calls for climate adaptation to be integrated into fisheries policies, early warning systems to be improved to protect fishers' safety, infrastructure to be rehabilitated, safe access to the sea to be ensured, and fisheries to be managed in partnership with local communities. It also emphasizes the importance of recognizing the roles of women and unregistered workers, directing long-term strategic funding towards the most exposed coastal communities to strengthen their adaptive capacity rather than relying solely on emergency and cash assistance, and enhancing regional cooperation to protect Red Sea resources.

Chapter 1: Introduction

Although Yemen contributes very little to global greenhouse gas emissions, it is among the countries most exposed to climate change impacts1. This disparity illustrates one of the clearest forms of climate injustice: communities that have contributed least to the crisis bear an increasing share of its consequences while having limited resources and options to respond. Traditional fishing communities on Yemen's west coast clearly reflect this disparity because they depend directly on the marine environment and have few alternative livelihood options2.

Traditional fishing is a key pillar of food security and livelihoods for Yemen's coastal communities, particularly those along the Red Sea coast3. However, these communities are facing rapidly changing environmental and climatic conditions in a country considered one of the poorest in the Middle East and North Africa4. These changes cannot be separated from the conditions Yemen has experienced since the outbreak of armed conflict in 2015. They interact with the militarization of coastal areas, restrictions on access to fishing grounds, rising operating costs, economic collapse, and the declining capacity of public institutions to manage marine resources and provide protection and support5.

These overlapping pressures intensify and complicate the impacts of climate change on fishers. As the need to adjust fishing seasons, reach new fishing grounds, or bear additional fuel and equipment costs increases, fishers' options become more limited because of security and economic constraints and inadequate services and information needed for adaptation. The problem, therefore, is not limited to ongoing changes in the marine environment and fish stocks. It also concerns the absence of enabling conditions that would allow coastal communities to respond to these challenges safely and fairly6.

Against this background, this paper adopts the concept of climate justice as a framework for analyzing the situation of traditional fishers on Yemen's west coast. It

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1World Bank Group, Yemen Country Climate and Development Report, November 2024, p. 1 and 12.

2Global Rights Compliance, in partnership with Musaala Organization for Human Rights, the Yemeni Coalition for Monitoring Human Rights Violations (Ras'd Coalition), and SAM Organization for Rights and Liberties, Yemen's West Coast Fishing Communities: Documenting Harm, Needs, and Priorities for Redress, July 30, 2026, p. 9; United Nations Development Programme (UNDP), Fishery Value Chain – A Market Study, 2020, p. 2.

3Ministry of Agriculture, Irrigation and Fish Wealth, Plan to Strengthen the Role of the Agriculture, Irrigation and Fish Wealth Sector to Improve Food Security (2023–2027), p. 16; Sector Network Rural Development Africa (SNRD Africa), Fisheries Sector: A Key Lever for Change in Yemen, April 9, 2025.

4World Bank Group, Yemen Country Climate and Development Report, November 2024, p. 1.

5Ammar Mohammed Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, Middle East Centre, London School of Economics and Political Science (LSE), December 2018, p. 15; Global Rights Compliance et al., Yemen's West Coast Fishing Communities, p. 14 et seq.

6World Bank Group, Yemen Country Climate and Development Report, November 2024, p. 1 and 4.

seeks to answer the following question: How do climate change impacts interact with conflict, economic pressures, and weak institutions to affect the livelihoods and adaptive capacity of traditional fishers?

The paper focuses on traditional fishing communities along the west coast since the outbreak of conflict in 2015, with field interviews concentrated in Al-Mokha and Dhubab. Its scope is limited to understanding how these overlapping pressures affect fishing, livelihoods, and adaptive capacity. It does not seek to provide a comprehensive assessment of all the impacts of climate change or conflict along the entire Yemeni coastline. Instead, it offers recommendations to protect coastal communities' rights, strengthen their capacity to adapt, and preserve their marine resources.

Chapter 2: The Importance of the Fisheries Sector to Yemen's Economy and Coastal Communities

Yemen has an extensive marine resource base, with a coastline stretching more than 2,500 kilometers along the Red Sea, the Gulf of Aden, and the Arabian Sea. These waters contain diverse and resource-rich marine ecosystems, including hundreds of fish species, as well as crustaceans, mollusks, and other marine organisms. These resources give the fisheries sector considerable productive and economic importance, making it a key sector for food provision, employment, and income, particularly in coastal areas7.

The sector is predominantly artisanal and small-scale. Most marine fishing in Yemen is carried out by local fishers using small boats and limited equipment. Before the conflict, artisanal fishers operated approximately 19,500 small boats and contributed more than 90% of total fish production. This pattern is particularly evident along the Red Sea coast, where small-scale fishing has been the dominant fishing activity and the main source of livelihood for thousands of fishers and their families8.

The sector extends beyond fishing itself to include a network of related activities, such as boatbuilding and maintenance, net making and the preparation of fishing equipment, fish transport, preservation and refrigeration, and the processing, marketing, and sale of fish. These activities provide income for hundreds of thousands of Yemenis and involve groups that are not always reflected in official statistics, including women and workers engaged in post-harvest activities. The sector's impact

7Ministry of Agriculture, Irrigation and Fish Wealth, Plan to Strengthen the Role of the Agriculture, Irrigation and Fish Wealth Sector to Improve Food Security, pp. 13–14; Cal Costa et al., Yemen Fisheries and Climate Change, International Growth Centre (IGC), p. 24.

8Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, p. 7; Cal Costa et al., Yemen Fisheries and Climate Change, p. 24.

therefore extends to entire communities whose economic and social lives depend on continued access to the sea and the availability of its resources9.

Before the conflict, fisheries were also an important source of export revenue and foreign currency. Yemeni fishery products reached approximately 50 countries, with Arab markets accounting for more than half of exports. In 2013, the value of fish exports reached approximately USD 290 million. This figure highlights the sector's importance to Yemen's economy and its potential to diversify national income, despite discrepancies between official statistics and limited data on actual catches and production10.

Fisheries are particularly important in coastal communities, where many residents depend on fish for both food and income. Fishing provides not only a product that can be sold but also a direct source of food for households, helping them cope with economic crises and rising prices of other goods. This role is increasingly important in a country experiencing high levels of food insecurity, shrinking employment opportunities, and declining sources of income, particularly in rural and coastal areas11.

The importance of fisheries, therefore, cannot be measured solely by production volumes or their contribution to exports and gross domestic product. The sector depends on a shared marine resource and is linked to social relationships, knowledge, and skills passed down through generations of fishing communities. Any decline in fish stocks or disruption of access to fishing grounds affects not only production volumes but also the entire value chain, threatening food supplies, employment, income, and the way of life on which coastal communities depend.

Thus, the study of the climatic, security, and economic pressures facing the sector takes on particular importance, given their direct impact on the ability of these communities to remain resilient, adapt, and uphold their economic and social rights12.

9United Nations Development Programme (UNDP), Fishery Value Chain, p. 2; World Bank Group, Yemen Country Climate and Development Report, p. 46. These sources indicate that the sector provides livelihoods for approximately 115,000 small-scale fishers and around one million family members, in addition to about 500,000 workers across the value chain. Furthermore, women's economic participation in the sector is estimated at roughly 6%, concentrated primarily in small-scale fish processing, drying, and salting.

10Cal Costa et al., Yemen Fisheries and Climate Change, p. 24; Ministry of Agriculture, Irrigation and Fish Wealth, Plan to Strengthen the Role of the Agriculture, Irrigation and Fish Wealth Sector to Improve Food Security, pp. 17–18.

11Global Rights Compliance, in partnership with Musaala Organization for Human Rights, the Yemeni Coalition for Monitoring Human Rights Violations (Ras'd Coalition), and SAM Organization for Rights and Liberties, Yemen's West Coast Fishing Communities: Documenting Harm, Needs, and Priorities for Redress, July 30, 2026, pp. 9–10.

12Human Rights Council, Report of the Special Rapporteur on the Right to Food, Michael Fakhri: Fisheries and the Right to Food in the Context of Climate Change, Document A/HRC/55/49, 2024, particularly paragraphs concerning the role of small-scale fisheries in providing food and livelihoods, the connection of local fishing communities to inherited knowledge, traditions, and values, and the necessity of protecting their access to aquatic resources.



Photographed on 25 July 2026 in Bab al-Mandab, this image shows a fishing boat heading out to sea on a daily fishing trip.

Chapter 3: Research Methodology

This paper adopts a hybrid research methodology combining desk research and qualitative interviews to understand how climate change affects the livelihoods of traditional fishers on Yemen's west coast and to analyze how these impacts interact with conflict, economic pressures, and institutional fragility.

3.1 Desk Review

The desk research reviewed scientific studies, data, and reports issued by Yemeni government authorities, international and regional organizations, research centers, and human rights organizations. The review focused on Yemen's fisheries sector, climate and environmental changes in the Red Sea, the effects of conflict on fishers, infrastructure, and the fisheries value chain, as well as literature on climate justice and small-scale fisheries. When using regional studies and climate projections, care was taken not to treat their findings as direct measurements specific to Yemen's west coast.

3.2 Field Research

Nine semi-structured interviews were conducted, focusing on Al-Mokha and Dhubab. Most interviews were conducted in person, while some took place by telephone, depending on the feasibility of reaching participants. The interviews included three traditional fishers, one of whom had survived a boat sinking; two women who had each

lost a family member working in fishing in separate incidents; and four community and human rights activists from fishing families or with direct links to fishers.

These interviews do not represent all fishers on Yemen's west coast, nor were they intended to generalize the participants' experiences to all coastal communities. Instead, they were used to gain a deeper understanding of specific experiences and compare them with findings from available studies, reports, and data.

3.3 Ethical Considerations

Participation in the research was voluntary. Informed consent was obtained from participants before the interviews, and the purpose of the research was explained. The confidentiality of information was protected, and no names or personal data were published. Participants were also informed of their right to decline to answer any question or withdraw from the interview at any time. They were told that participation would not result in assistance or compensation.

3.4 Data Analysis

The paper uses qualitative analysis of field data, comparing interview findings with official data, statistics, and relevant scientific literature. The aim is to connect field testimonies with the human rights framework of climate justice and analyze how climate change and armed conflict affect the rights to work, food, and sustainable livelihoods.

Chapter 4: Analytical Framework

4.1 Why Is the Situation of Fishers on Yemen's West Coast a Climate Justice Issue?

The impacts of climate change are not distributed equally among countries or within a given society. The extent of harm is determined not only by the severity of a climate hazard, but also by the degree of exposure to it, economic and social vulnerability, and the resources available for adaptation. From this perspective, climate justice does not treat climate change and climate-related phenomena as environmental changes detached from people's lives. Rather, it examines responsibility for the crisis, how its burdens are distributed, who has access to the resources, information, and power needed to adapt, and the extent to which affected groups participate in decisions concerning resources, financing, and protection13.

13Mary Robinson Foundation – Climate Justice, Principles of Climate Justice, pp. 1–2; Intergovernmental Panel on Climate Change (IPCC), Climate Change 2022: Impacts, Adaptation and Vulnerability – Technical

The case of Yemen clearly illustrates this inequality. According to the Yemen Country Climate and Development Report, the country contributes approximately 0.05% of global greenhouse gas emissions. Nevertheless, it is classified among the countries most exposed to climate risks and least prepared to adapt. This is due to the interaction of climate hazards with conflict, poverty, institutional deterioration, and the decline of public services14. Along Yemen's west coast, however, this inequality takes an even more pronounced form: traditional fishing communities depend directly on a rapidly changing marine ecosystem, despite contributing virtually nothing to the causes of global warming and lacking adequate means to monitor or respond to these changes.

The harm experienced by fishers is not limited to their exposure to climate change; it also extends to the conditions they face when attempting to respond to it. Adapting to changes in wind seasons or fish distribution requires adjustments to the timing of fishing trips, fishing grounds, and fishing gear. These choices depend on the availability of fuel, equipment, financing, and climate information, as well as safe access to the sea and markets. However, many fishers rely on fishing as their primary or sole source of income, while limited capital, rising fuel costs, damaged infrastructure, and restrictions on access to the sea all constrain their ability to make such adjustments15.

Interviews provide tangible evidence of this inequality. Fishers and activists explained that reaching more distant fishing grounds requires more than fuel alone. It also requires a reliable engine, a boat capable of undertaking longer journeys, adequate food and water supplies, communication and safety equipment, and sufficient capital to cover the risks involved if a trip yields no catch. Consequently, those who have boats, fuel, and the necessary equipment can follow fish into more distant waters, while those who work for daily wages or lack these resources may be forced to remain close to shore, work for boat owners, or temporarily stop fishing.

Summary, Working Group II Contribution to the Sixth Assessment Report, 2022, p. 43; noting that the report explains that climate risks arise from the changing interaction between climate hazards, exposure, and vulnerability.

14World Resources Institute (WRI), Yemen: Greenhouse Gas Emissions Data, 2023 data; World Bank Group, Yemen Country Climate and Development Report, pp. 9, 21–22.

15Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 7, 11, 16, 18–19; World Bank Group, Yemen Country Climate and Development Report, pp. 91–92.

One fisher in Al-Mokha explained:

> *"Venturing into deeper waters requires reserve fuel, good engines, and equipment to protect you if the boat breaks down. Some fishers cannot afford these things, so they are forced to fish close to shore in search of a daily income. If a fisher does not work for a day, they have no money to cover that day's expenses16."*

In this context, the paper emphasizes the importance of recognizing differences in adaptive capacity within fishing communities themselves. It should not be assumed that all fishers and coastal households have equal access to the resources and options needed to cope with climate change. However, given its qualitative nature and the limited number of interviews conducted, this research does not seek to measure these disparities or undertake a systematic comparison among different groups within coastal communities. Understanding these inequalities, along with the economic, social, geographical, and gender-related factors that shape them, therefore remains an important area for future, more extensive research.

Building on this understanding, the paper adopts the principles of climate justice as a framework for analyzing the circumstances of traditional fishing communities along Yemen's west coast through four interconnected dimensions17. The first, distributive justice, calls for the fair allocation of burdens and resources, with support and compensation directed toward those most severely affected. Procedural justice emphasizes the right of coastal communities to participate meaningfully in policymaking and decision-making concerning marine resource management and climate change adaptation. Meanwhile, recognitional justice focuses on acknowledging traditional fishers, women, and workers throughout the fisheries value chain as rights-holders whose local knowledge and experiences must be taken into account, rather than treating them merely as aid recipients or victims of crises18. This framework is completed by the principle of intergenerational justice, which links the protection of marine ecosystems and the sustainability of fish stocks to safeguarding future generations' rights to natural resources and sustainable livelihoods19.

16Interview conducted by the research team with Artisanal Fisher No. (1), West Coast, 2026.

17Food and Agriculture Organization of the United Nations (FAO), Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, Rome, 2015.

18David Schlosberg, "Reconceiving Environmental Justice: Global Movements and Political Theories," Environmental Politics, Vol. 13, No. 3, September 2004, pp. 517–540.

19United Nations, United Nations Framework Convention on Climate Change (UNFCCC), 1992, Article 3(1), p. 5.

4.2 Climate Pressures on the Fisheries Sector along Yemen's West Coast

4.2.1 Ocean Warming

The annual maximum sea surface temperature in the Red Sea increased by an average of 0.17 ± 0.07°C per decade between 1982 and 2015. This was higher than the global ocean warming rate during the same period, which was approximately 0.11°C per decade. However, warming rates varied across different parts of the Red Sea20.

Climate change is not limited to a gradual increase in sea temperatures. A recent study identified 78 marine heatwaves in the Red Sea between 1982 and 2021. Of these, 46% occurred during the final decade of the study period, accounting for 58% of the total number of days affected by these heatwaves. Coastal areas in the southern Red Sea and the Bab al-Mandab Strait recorded the highest average frequency of marine heatwaves, while longer and more intense heatwaves were more common in the northern Red Sea21.

Higher sea temperatures and extreme marine heatwaves can affect the growth, reproduction, and survival of marine species. They may also change the seasons when certain fish species appear or force them to move into deeper waters or areas with more suitable conditions22. Although there is not enough local data to confirm that specific fish species have moved away from Yemen's west coast because of warming, fishers' reports of changes in fishing seasons and fewer fish near the shore are consistent with the types of changes that rising sea temperatures can cause.

4.2.2 Changes in Marine Productivity

Fish abundance depends not only on water temperature but also on the ability of the marine ecosystem to produce the food that supports the marine food chain. Chlorophyll-a is an indirect indicator of the abundance of phytoplankton and primary productivity, which form the foundation of the marine food web23.

20Veronica Chaidez et al., "Decadal Trends in Red Sea Maximum Sea Surface Temperature," Scientific Reports, 2017.

21Manal Hamdeno et al., "Investigating the Long-Term Variability of Red Sea Marine Heatwaves and Their Relationship to Different Climate Modes: Focus on 2010 Events in the Northern Basin," Ocean Science, 2024.

22Cal Costa et al., Yemen Fisheries and Climate Change, pp. 7–10; World Bank Group, Yemen Country Climate and Development Report, p. 47; A study published in 2025 recorded a mass fish kill on the Saudi coast in the central Red Sea, which coincided with a severe marine heatwave in late August 2023. It documented nearly one thousand dead fish belonging to 54 species over a stretch of about 60 kilometers. The study did not conclusively determine the cause of the mortality, but suggested it was linked to heat-induced physiological stress and accompanying factors. This case does not constitute evidence of a similar impact off the Yemeni coast, but it illustrates the type of environmental risk that may accompany severe heatwaves. Benjamin Titpool et al., "Severe Marine Heatwave Associated with Mass Fish Mortality in the Red Sea," Science of the Total Environment, Vol. 975, 2025, Article 179073.

23Cal Costa et al., Yemen Fisheries and Climate Change, pp. 4 and 7–9.

Rising temperatures in surface waters can make these waters more stable and reduce their mixing with deeper, nutrient-rich waters. This can affect phytoplankton growth and marine productivity. However, these effects are not the same across all parts of the Red Sea. Marine productivity is also influenced by seasonal winds, ocean currents, and water exchange through the Bab al-Mandab Strait24.

Regarding Yemeni waters, the Climate and Development Report projects a decline in the maximum potential catch by between 16.6% (under the lower-emissions scenario) and 23.1% (under the higher-emissions scenario) between 2041 and 2050, compared to 202025. These figures do not represent an observed decline or a projection specific to the west coast. Rather, they signal a risk to the future productive capacity of Yemen's fisheries under climate change.

This threat is worsened when it intersects with overfishing, poor stock management, and a lack of data. Furthermore, fishers who rely on nearshore fisheries are likely to bear a larger share of the losses due to their limited ability to move to alternative fishing grounds.

4.2.3 Changes in the Characteristics of the Marine Environment

Due to its semi-enclosed nature and high evaporation rates, the Red Sea is affected by changes in salinity, water temperature, and water movement26. These changes become significant when they exceed the natural range of variation to which marine organisms have adapted. While salinity affects fluid and energy balance within organisms' bodies, egg and larval stages can be especially sensitive to these changes. Additionally, temperature and salinity together affect water density, mixing, and the movement of nutrients. However, the available data do not allow the independent effect of salinity on a specific fish stock along the west coast to be determined; therefore, this paper presents salinity as an indicator that requires monitoring rather than a proven cause for declining catches27.

The sea absorbs a portion of the carbon dioxide in the atmosphere, which alters carbonate chemistry and gradually lowers water pH—a process known as ocean acidification28. Over the long term, this can affect the ability of coral reefs and calcifying organisms to build their structures, grow, and recover. Because Yemeni waters lack sufficient direct measurements of acidification, this paper presents the phenomenon as a risk requiring monitoring—due to its potential interaction with

24Cal Costa et al., Yemen Fisheries and Climate Change, pp. 9–10 and 22–23.
25World Bank Group, Yemen Country Climate and Development Report, p. 67.
26Cal Costa et al., Yemen Fisheries and Climate Change, pp. 10–12.
27Cal Costa et al., Yemen Fisheries and Climate Change, pp. 11–12 and 22–23.
28Cal Costa et al., Yemen Fisheries and Climate Change, pp. 10–11 and 22–23; World Bank Group, Yemen Country Climate and Development Report, p. 47.

warming and local pressures—rather than as a proven cause for the decline in catches off the western coast29.

Coral reefs, seagrasses, and scattered mangrove areas provide spawning, nursery, and feeding habitats for many fish and other marine organisms30. Consequently, the degradation of these habitats is not an environmental loss separate from the fishing sector; rather, it threatens the natural foundation upon which stock renewal and the sustainability of coastal livelihoods depend. Therefore, combating pollution, destructive fishing, and encroachment on nursery areas helps enhance the capacity of these habitats to withstand and recover from climate pressures.

4.2.4 Wind Disturbances and Extreme Climate Events

In addition to gradual changes in the marine environment, coastal communities on the west coast face risks associated with extreme climate events, such as sea storms, heavy rainfall, coastal flooding, and disrupted monsoon wind patterns.

These events pose a particular challenge to traditional fishers because their fishing trips rely heavily on accumulated experience in reading wind movements, currents, and seasons. When wind patterns become unpredictable in timing or direction, the loss is not limited to wasted days at sea; it extends to the safety of the fisher and their boat, as well as the stability of household income and the family's ability to cover daily needs.

A study on traditional fishers in the Red Sea indicates that half of the participants cited unstable weather conditions—particularly winds—as a major factor limiting their fishing trips31. While this finding does not prove that climate change is responsible for every instance of bad weather, it highlights how deeply fishing activity and household income depend on stable marine conditions.

One fisher interviewed by the research team described this shift, saying:

> *"There are changes in the wind patterns. Around this time of year, the sea was supposed to have cooled down, but that hasn't happened yet. This year, northerly winds came and then southerly winds returned during the same period... You do not know which direction the wind will come from, so you go out to sea feeling afraid32."*

29Cal Costa et al., Yemen Fisheries and Climate Change, pp. 10–11 and 23.

30World Bank Group, Yemen Country Climate and Development Report, p. 47; Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA), Status of Mangroves in the Red Sea and Gulf of Aden, Technical Series No. 11, 2004, pp. 32–33 and 38–39.

31Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 16–17. 50% of participants reported that unsafe weather conditions, particularly winds, are among the significant factors limiting fishing trips.

32Interview conducted by the research team with Artisanal Fisher No. (1), West Coast, 2026.

Although such testimonies do not serve as a definitive climatic measure, they reveal the human impact of losing the ability to predict the wind: increased fear, heightened risk, and greater difficulty in deciding whether to set sail. Furthermore, when strong winds persist for several days, it means more than just a pause in fishing—it results in a complete interruption of household income, forcing families to borrow money or rely on relatives and neighbors.

A fisher from Al-Mokha stated:

> *"When the winds come and last for seven days, you have to borrow money from your neighbor or family until God grants you income from the sea, and then you pay off the debt. So, you are always worrying about debt and tomorrow's livelihood; it is exhausting33."*

Storms, heavy rainfall, and coastal flooding further exacerbate these risks. They can damage boats, landing sites, roads, and cold-storage facilities, causing the impact of these phenomena to extend beyond the sea to affect the entire fisheries value chain34. These losses are further compounded by the absence of weather information and early warning systems, safety equipment, social protection networks, and alternative sources of income.

4.2.5 Marine Accidents and Gaps in Protection and Rescue

The severe impacts of rough seas go beyond the loss of working days. They also include accidents that may result in death, people going missing, or the loss of boats and fishing equipment. The interviews directly documented three incidents. In an incident on 1 October 2024, a fisher who survived the sinking of his boat described how a sudden change in sea conditions coincided with engine failure. A large wave then hit and capsized the boat, resulting in the deaths of four of his companions and the loss of the boat, engine, and fishing nets. In two separate incidents, the mother of a fisher described how the wind suddenly became stronger after her son had gone out to sea in what appeared to be calm conditions, causing his boat to capsize and killing him. Meanwhile, the daughter of another fisher spoke of her father heading out to fish on a day when the winds were strong, driven by his family's need for the food and income he provided.

The available evidence does not allow these deaths and boat accidents to be attributed to climate change alone. They result from a combination of factors, including sudden

33Interview conducted by the research team with Artisanal Fisher No. (1), West Coast, 2026.

34World Bank Group, Yemen Country Climate and Development Report, pp. 47, 67, and 92; United Nations Development Programme (UNDP), Project Document: Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH), 2022.

changes in sea conditions, engine failure or an inadequate boat, the lack of communication equipment and life jackets, the inability to call for help, and weak search-and-rescue services.

Dependence on daily income may also push fishers to go to sea despite knowing the risks, because staying ashore may mean that their families have no food that day. From a climate justice perspective, the key issue is that increasing uncertainty at sea affects fishers who work with very limited protection, while their families bear almost all the consequences of losing a family member and their means of production.

Fishers and activists also reported other incidents involving capsized boats, engine failures, and fishers drifting for days far from their usual fishing grounds, running out of food and water before being rescued. Although there is insufficient information to independently verify all these incidents, they point to a recurring pattern that highlights the need for an official system to record marine accidents and investigate their causes. Such a system should document weather conditions, the state of the boat, available equipment, and response and rescue times.

A fisher who survived a fishing boat accident describes what happened:

> *"We were surprised by a change in sea conditions, and the engine broke down. A huge wave came and capsized the boat with everything on it. I was the only one who survived, and I lost my four companions. The boat, engine, and nets were all lost. Now I am unemployed and have nothing left.35"*

The mother of a fisher who died when his boat capsized off the west coast describes the tragedy:

> *"My son was a fisher who worked for daily wages. He went out as usual, and the sea was calm. Then the weather changed, strong winds blew, and the boat capsized. He could not swim or call for help. He remained in the sea until he died, and we waited for days before his body was found. We demand protection for fishers, monitoring of their safety, and the provision of communication and emergency equipment so that, if a fisher is in danger, he can call for help and have the equipment needed to protect him until rescuers arrive36."*

Another testimony from a fisher's daughter reveals a further factor that is often missing from accident records: the decision to go to sea may not be a free choice between safety and risk. Instead, it may be driven by the immediate need for food. The interviewee

35Interview conducted by the research team with a traditional fisher who survived a drowning incident, West Coast, 2026.

36Interview conducted by the research team with the mother of a fisher who died in a boat capsizing incident, West Coast, 2026.

explained that her father went fishing on a day when the winds were strong because the family depended on his catch to obtain food.

Methodologically, this does not mean that poverty caused the accident. However, it shows how the lack of social protection can force some fishers to accept risks they might otherwise avoid if their families had an alternative source of income or temporary support during unsafe weather conditions.

A fisher's daughter describes the boat accident off the west coast that killed her father, the family's primary breadwinner:

> *"The winds were strong that day, but if he had not gone fishing, we would have had nothing to eat. So he had to go out to sea.37"*

The impacts of these accidents do not end with the fisher's death or the loss of a boat. They extend to the family, creating a chain of economic and social hardships. Interviews with women revealed similar consequences, including loss of income, psychological trauma, difficulties in securing food and education, and dependence on assistance from others. These testimonies show that the absence of insurance, compensation, and social protection can turn a marine accident from an individual loss into a prolonged period of hardship affecting the rights to food, education, mental health, and livelihoods.

Activists also noted that women face additional burdens when fishing stops or the family's primary breadwinner is lost. These include using savings or selling gold, seeking small or low-paid jobs, and taking on greater responsibility for providing food and care. Women working in fish preparation, drying, and selling are also affected by declining catches, even though their economic contributions are not always reflected in official fisheries data.

The fisher's daughter describes the extent of the loss following her father's death:

> *"After my father died at sea, we lost everything we had: the boat, engine, and fishing equipment. We have no other source of income. I left school because we could no longer afford the costs of education. Sometimes, we manage to eat only one meal a day, which we get from our neighbors.38"*

37Interview conducted by the research team with the daughter of a fisher who died in a boat capsizing incident, West Coast, 2026.

38Interview conducted by the research team with the daughter of a fisher who died in a boat capsizing incident, West Coast, 2026.

4.2.6 Fishers Left Out of Policies and Protection

Recognition of fishers as rights-holders with valuable knowledge and experience is not adequately reflected in policies and interventions targeting them. Interviewees described fishers' participation in program design and priority-setting as limited or nonexistent. They noted that support is often provided in the form of separate pieces of equipment or short-term assistance, without addressing fuel, safety, rescue services, markets, and social protection in an integrated way. Some also raised concerns about the fairness of beneficiary selection. These statements are not sufficient to establish that this is a widespread institutional pattern. However, they highlight the need for transparent distribution criteria, grievance mechanisms, and the direct participation of fishers, women, and daily-wage workers in identifying their needs.

A community activist from a fishing family explains:

> *"Fishers may be overlooked and have no place in policy, decision-making, or even in the selection of beneficiaries for programs and activities. Fishing communities are on one side, while current policies and interventions are on the other, as if fishers were a group that did not exist, even though most people living along the west coast are fishers.39"*

This exclusion goes beyond limited participation or a lack of programs. It also means a lack of protection itself. A community and human rights activist from a fishing family explained that, after years of conflict, fishers had been "left completely without protection." They had no government body capable of protecting them at sea, defending them when detained, or ensuring their safe access to fishing grounds40.

39Interview conducted by the research team with a community activist from a fishing family, West Coast, 2026.

40Interview conducted by the research team with a community and human rights activist from a fishing family, West Coast, 2026.



Fishing boats returning to the landing site after a trip in the Red Sea. Al-Qataba area, Al-Khawkhah, 3 August 2026.

4.3 The Limits of What We Know — The Data Gap as a Scientific Problem and a Matter of Justice

The ability to measure the impact of climate change on Yemen's fisheries remains limited because of the lack of field-based marine measurements, weak data on catches, fishing effort, and species composition, and the absence of regular fish stock assessments. As a result, available knowledge relies heavily on satellite data and regional studies. These sources are useful for identifying general trends, but they cannot replace regular local measurements and do not always allow researchers to distinguish climate impacts from those caused by overfishing, pollution, and conflict. This data gap has been worsened by the disruption of institutions, fragmented records, and the fact that around 70% of weather and water monitoring stations have become non-operational, been destroyed, or been looted41.

The situation is evident at the local level in Al-Mokha. A community and human rights activist from a fishing family reported that the city's weather station stopped operating during the conflict42. The loss of this station means more than a reduction in data collection. It also means less access to local information and warnings that fishers need to understand sea conditions and make safer decisions about when to go out to sea.

The limitations of available knowledge are also evident in estimates of the potential decline in Yemen's fish catch. This estimate was not based on a direct local model but

41Costa et al., Yemen Fisheries and Climate Change, pp. 7–11, 23, and 26–29; World Bank Group, Yemen Country Climate and Development Report, p. 24.

42Interview conducted by the research team with a community and human rights activist from a fishing family, West Coast, 2026.

on a weighted average of findings from Somalia, Oman, and Djibouti43. This estimate provides a reasonable indication of the direction of the risk, but it does not represent a measured decline or an accurate forecast for fisheries along Yemen's west coast. Similarly, fishers' testimonies help document observed changes and their effects on livelihoods, but they are not sufficient on their own to attribute every change to climate change.

The data gap weakens fishers' ability to make safe decisions, limits institutions' capacity to manage fish stocks, and makes it harder for communities to demonstrate the harm they have suffered or access funding for adaptation and compensation. Climate justice therefore requires procedural fairness: coastal communities must have the right to access information, participate in producing and verifying it, and ensure that their knowledge is incorporated into monitoring systems and decision-making.

4.4 Cumulative Vulnerability Deepened by Conflict and Weakened Adaptive Capacity

The vulnerability of Yemen's fisheries sector did not begin with the outbreak of conflict in 2015. Before the conflict, the sector already faced weak fish stock assessments and catch data collection, inadequate fisheries monitoring, limited infrastructure for fish preservation, refrigeration, and marketing, and insufficient services, financing, and equipment for fishers. Some fishing activity also took place outside official landing centers, reducing the accuracy of available data and limiting institutions' ability to manage the resource. Sector documents published before the conflict confirm that fisheries were at risk of depletion because of weak management, while adequate stock assessments and data needed to determine sustainable fishing levels were lacking44.

Harmful practices affecting fish stocks and marine habitats are also widespread. These include the use of small-mesh nets, fishing in nursery areas or during closed seasons, and illegal and unreported fishing. The continuation of these practices is linked to weak enforcement, a lack of alternatives, high fishing costs, limited guidance, and inadequate participation by fishers in developing clear and enforceable rules. Conflict did not create the sector's vulnerability from scratch. Rather, it deepened existing

43World Bank Group, Yemen Country Climate and Development Report, p. 46, footnote 80. The report states that the studies used did not include specific Yemeni data on direct impacts on fisheries or the degree of environmental risk; therefore, Yemen's estimate was based on a weighted average of results for Somalia (50%), Oman (45%), and Djibouti (5%), according to reported Yemeni fishing zones in 2018.

44Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 7–8; United Nations Development Programme, Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH), Project Document, 2021, p. 20.

weaknesses and undermined the institutional and material capacities that could have been used to manage fish stocks and help fishers adapt45.

Since 2015, parts of the Red Sea and Yemen's west coast have become areas of military operations, air and naval strikes, restricted zones, and security-related limitations. Some attacks have affected fishers, fishing boats, markets, and facilities on which the sector depends. Fear of being targeted or detained has also restricted access to fishing grounds. Human rights and humanitarian organizations have documented deadly attacks on civilian fishing boats, as well as damage to fishing ports, landing centers, and fish processing and marketing facilities. These risks increased further as hostilities in the Red Sea escalated from late 2023, with renewed attacks and the presence of warships. As a result, some fishers suspended their trips, stayed closer to shore, or left their coastal areas46.

Sea and land mines, remnants of war, and the risk of detention or confiscation of boats and equipment at sea impose further long-term restrictions on fishers' movements. The impact extends beyond those directly harmed. Even the suspicion that mines are present, or fear of detention, can lead fishers to avoid certain maritime areas and routes, even when these areas are more productive. Reports have documented the detention of Yemeni fishers by different parties, particularly Eritrean forces, with some cases involving violence, forced labor, and the confiscation of boats and equipment. These incidents have deprived families of their income and forced some fishers to abandon the profession, sell their belongings, or work as daily-wage laborers for other boat owners47.

At the same time, rising prices for fuel, engines, nets, and spare parts have increased fishing costs and reduced profits. This is where the connection between conflict and climate change becomes clear. When nearby catches decline or fish move to different locations, fishers may need to travel farther to reach productive fishing grounds. However, higher costs, security risks, mines, and the possibility of detention may prevent them from doing so. Relocating to another fishing area, rather than serving as a means of adaptation, becomes a decision involving financial and security risks that

45Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 8 and 28–29; Ministry of Agriculture, Irrigation and Fish Wealth, Plan to Strengthen the Role of the Agriculture, Irrigation and Fish Wealth Sector, pp. 21 and 41–42.

46Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 6, 9–10, and 16–19; Human Rights Watch, Yemen: Coalition Warships Attack Fishing Boats, August 21, 2019; Global Rights Compliance, in partnership with Musaala Organization for Human Rights, the Yemeni Coalition for Monitoring Human Rights Violations (Ras'd Coalition), and SAM Organization for Rights and Liberties, Yemen's West Coast Fishing Communities: Documenting Harm, Needs, and Priorities for Redress, July 30, 2026, pp. 11 and 15–19; United Nations Office for the Coordination of Humanitarian Affairs, Briefing to the Security Council on Yemen, March 14, 2024.

47Global Rights Compliance, in partnership with Musaala Organization for Human Rights, the Yemeni Coalition for Monitoring Human Rights Violations (Ras'd Coalition), and SAM Organization for Rights and Liberties, Yemen's West Coast Fishing Communities: Documenting Harm, Needs, and Priorities for Redress, July 30, 2026, pp. 20–32; Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 15–19.

fishers may be unable to bear. Conflict therefore does not simply add separate harms to climate pressures; it also undermines the means fishers need to cope with those pressures48.

The effects of conflict extend beyond fishing trips and the landing of catches. They affect interconnected parts of the value chain, including roads, transport, electricity networks, ice factories, refrigeration, storage and processing facilities, markets, and landing centers. Disruptions to these facilities increase post-harvest losses, reduce fish quality and value, and limit fishers' ability to preserve their catch until they can sell it at a reasonable price. The damage also affects people working after the catch is landed, including transport workers, vendors, retailers, and those involved in processing and marketing. Estimates indicate a significant decline in fish production, employment opportunities, and related trade during the conflict, with only about half of the Red Sea fishers remaining active in the sector during part of 201849.

The decline in fishing activity is reflected not only in fewer trips to sea; some fishers have left the profession entirely. Activists reported that some had sought other jobs, moved to governorates such as Hadramawt and Al-Mahrah, or joined military forces and formations in search of a more stable income. The interviews do not allow the scale of this trend to be measured or attributed to climate change alone. It is linked to declining returns, higher operating costs, security restrictions, weak markets, and the lack of stable civilian livelihood alternatives. Nevertheless, these accounts show how accumulated pressures can push some families to abandon fishing, while conflict-related employment becomes one of the few alternatives available to young people.

A community and human rights activist from a fishing family explains:

> *"A fisher will tell you: In a military job, my salary is guaranteed and my expenses are covered, unlike fishing. Some fishers say they cannot change their profession, but many have left fishing altogether.50"*

The conflict has weakened the capacity of fisheries institutions and associations to collect data, monitor fishing activities, provide guidance, and organize markets and landing centers. Institutional fragmentation has also scattered records and regulations and led to the loss of some staff and accumulated expertise. As a result, fishers lack early warning systems, reliable information, adequate financing, and appropriate equipment. Institutions are also unable to collect sufficient data to assess the condition

48Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 15–16 and 18–21; World Bank Group, Yemen Country Climate and Development Report, November 2024, pp. 55–59.

49Ammar Al-Fareh, The Impact of the War in Yemen on Artisanal Fishing of the Red Sea, pp. 9–10 and 26–27; World Bank Group, Yemen Country Climate and Development Report, November 2024, pp. 56–59.

50Interview conducted by the research team with a community and human rights activist from a fishing family, West Coast, 2026.

of fish stocks or direct support toward the most exposed areas and groups. Adaptation therefore cannot be reduced to distributing boats or nets. It requires building institutions that can produce knowledge, communicate it to fishers, enforce fair rules, protect access to the sea, and maintain the value chain that gives fish catches their economic and nutritional value.51



Fishing boats returning to the landing site after a trip in the Red Sea. Al-Qataba area, Al-Khawkhah, 3 August 2026.

4.5 Yemen's West Coast within the Red Sea — A Shared Resource and Shared Challenges

Coastal communities along Yemen's west coast do not depend on isolated local resources. They are part of the wider Red Sea ecosystem, which is shared by many countries and communities. Fish stocks, marine habitats, and the pressures they face from climate change, pollution, and illegal fishing do not stop at political borders. For this reason, regional fisheries programs classify the resources of the Red Sea and Gulf of Aden as shared, transboundary resources. They emphasize that their sustainability requires data sharing, fish stock monitoring, and coordination among countries in fisheries management and in addressing the threats facing these resources52. This cooperation is supported by the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, adopted in 1982, to which Yemen is a party53.

51Ministry of Agriculture, Irrigation and Fish Wealth, Plan to Strengthen the Role of the Agriculture, Irrigation and Fish Wealth Sector to Improve Food Security, pp. 21 and 41–42; United Nations Development Programme, Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH), Project Document, 2021; World Bank Group, Yemen Country Climate and Development Report, November 2024, pp. 58–59.

52United Nations Development Programme, Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH), Environmental and Social Management Framework (ESMF), April 2022.

53Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, 1982, Preamble and Articles 1, 3, 10, and 12, pp. 2–8.

This interdependence places the concerns of fishers along Yemen's west coast within a broader regional discussion about the future of fisheries and the blue economy in the Red Sea. Although communities around the Red Sea share the sea as a source of food, income, and employment, their opportunities to benefit from it and their ability to protect it and adapt to its changes are unequal. In Yemen, the effects of conflict, weak institutions, and inadequate infrastructure limit coastal communities' access to regional knowledge, financing, and technologies. They also restrict their participation in decisions concerning the resources on which their livelihoods depend.

Regional cooperation should therefore ensure that Yemen and its coastal communities participate meaningfully and have access to resources allocated for sustainable fisheries and climate change adaptation. Such cooperation should go beyond protecting the marine environment or promoting investment54.

The countries bordering the Red Sea cannot bear the cost of addressing climate change threats on their own. Climate change is a global crisis, and the Paris Agreement recognizes that the response must be based on equity and the principle of common but differentiated responsibilities. It also calls on developed countries to provide financial and technical support to developing countries. Protecting the Red Sea goes beyond regional interests because it contains ecosystems of global importance and supports biodiversity and international trade. Regional cooperation therefore requires international support and funding55.

54World Bank, Stakeholder Engagement Plan (SEP): Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH) (P178143), 2022, pp. 2–4 and 24–25.

55United Nations, Paris Agreement on Climate Change, 2015, Articles 2(2), 7(6), 9(1), 10, and 11.

Chapter 5: Recommendations

This paper shows that the challenges facing the fisheries sector along Yemen's west coast are not caused by climate change alone or by armed conflict alone. They result from the interaction of climate pressures, institutional weaknesses, security restrictions, and economic challenges. These factors have limited coastal communities' ability to adapt and prevented them from benefiting fairly from their marine resources.

Although the Ministry of Agriculture, Irrigation and Fish Wealth's Strategic Plan (2023–2027) recognizes the economic and social importance of the fisheries sector and emphasizes the need to develop it and strengthen its contribution to food security and development, it does not adequately address the challenges associated with climate change. Nor does it clearly integrate climate adaptation measures or climate justice principles into its implementation priorities56.

Based on the findings, this paper proposes the following recommendations.

5.1 Strengthen Early Warning Systems and Fishers' Safety

Meteorological authorities, fisheries agencies, and local authorities should develop a marine early warning system that provides fishers with timely, easy-to-understand information about wind conditions, wave heights, storms, and unsafe periods for going to sea. Warnings should be communicated through text messages, local radio stations, fishers' associations, and fish landing centers, taking into account the communication methods available in coastal villages.

The system should be accompanied by affordable safety, communication, and navigation equipment, as well as training to help fishers understand warnings and respond appropriately. Arrangements should also be established for maintaining and replacing equipment. Marine accidents should be systematically documented, and the information collected should be used to improve warnings and identify the areas and periods associated with the highest risks.

5.2 Ensure Safe Access to the Sea and Protect Fishing Facilities

Conflict parties and security and military authorities should review restrictions on access to the sea and fishing grounds and ensure that these restrictions do not go beyond what is necessary. Restricted areas, dangerous zones, and mine-contaminated areas should be clearly identified, and fishers should be regularly informed of them.

56Ministry of Agriculture, Irrigation and Fish Wealth, Plan to Strengthen the Role of the Agriculture, Irrigation and Fish Wealth Sector to Improve Food Security (2023–2027).

Fishers should not be left to face undisclosed restrictions that could expose them to detention, injury, or loss of income.

Landing centers, ports, and fisheries facilities should be protected from actions that disrupt their civilian functions. Efforts should also be made to remove mines and explosive hazards from coastal areas and routes leading to the sea. Safe channels should be established for fishers to report attacks, detention, and the loss of boats and equipment. These reporting channels should be linked to investigation, accountability, and reparation mechanisms.

5.3 Integrate Climate Adaptation into Fisheries Policies

The Ministry of Agriculture, Irrigation and Fish Wealth and its affiliated agencies should clearly integrate climate adaptation into fisheries sector plans, budgets, and programs. Adaptation should be linked to livelihood protection, food security, and the sustainability of marine resources. This requires clearly defining responsibilities, priorities, and funding sources, while giving priority to the most climate-exposed communities along Yemen's west coast.

Planning should also be based on a regular data collection system that records catch volumes, species, fishing seasons, and locations, as well as the condition of fish stocks and marine habitats. It should also assess how rising temperatures, changing winds, and storms affect fishing activities. Monitoring tools should be standardized, staff trained in their use, and fishers' knowledge incorporated into the process. Findings should be made available to researchers, associations, and local communities.

5.4 Rehabilitate Infrastructure and Support Livelihood Stability

The government and local authorities, with support from donors and development organizations, should rehabilitate fish landing centers, refrigeration and storage facilities, ice factories, and roads connecting fishing grounds to markets. Rehabilitation should follow standards that account for flooding, strong winds, coastal inundation, and sand accumulation. Priority should be given to areas that combine high exposure to risks, poor services, and heavy dependence on fishing. Clear arrangements should also be established to operate and maintain facilities after project funding ends.

Support should also be provided for fish processing, preservation, and marketing, as well as the maintenance of boats and fishing equipment. The use of solar energy in refrigeration facilities should be expanded, and affordable financing should be made available for businesses across the fisheries value chain. During storms, disasters, or periods when fishing is forcibly suspended, temporary cash or food assistance could help families meet their basic needs. Such assistance should complement, rather than

replace, long-term investments. Existing interventions, including the Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH) Project, could provide a foundation for this work, provided that the sustainability of facilities and fairness in beneficiary selection are ensured57.

5.5 Manage Fisheries in Partnership with Communities

Fisheries agencies and local authorities should adopt co-management approaches through committees that include genuine representatives of fishers, fishing associations, value chain workers, women, and researchers. These committees should participate in collecting data, identifying spawning and nursery areas, proposing closed seasons and protected areas, monitoring the implementation of management plans, and assessing their effects on marine resources and livelihoods.

Rules should be based on the best available data and local consultations. Fishers should receive clear information about these rules sufficiently in advance, and measures should be introduced to reduce income losses during fishing closures. Bans on small-mesh nets, bottom trawling, explosives, toxic substances, and fishing in spawning and nursery areas should be enforced without discrimination against traditional, commercial, or foreign boats, or influential actors. Grievance and appeal procedures should be available, and fishers should receive support to transition to legal fishing equipment and methods.

5.6 Recognize Women and Unregistered Workers in the Fisheries Sector

Government agencies and implementing organizations should broaden the definition of fisheries sector workers. In addition to boat owners and registered fishers, this should include women, young people, and those involved in cleaning, processing, drying, preserving, transporting, and marketing fish. It should also include family members who perform economically valuable work that is unpaid or not formally recognized.

Financing, training, and support programs should be based on an assessment of these groups' actual roles and needs. Barriers that prevent them from benefiting from such programs should be removed, including requirements for formal ownership, professional registration, or financial guarantees. Their meaningful and safe participation in fisheries management committees and climate consultations should also be ensured so that they can influence policy design and resource allocation.

57United Nations Development Programme, Sustainable Fishery Development in Red Sea and Gulf of Aden (SFISH), Environmental and Social Management Framework (ESMF), April 2022.

5.7 Direct Funding toward the Most Climate-Exposed Coastal Communities

Donors, financial institutions, and international organizations should allocate long-term funding for climate adaptation in the fisheries sector. Funding should focus on strengthening institutional capacity, restoring monitoring systems, rehabilitating infrastructure, improving early warning systems, supporting fisheries management, and strengthening value chains. Transparent criteria should be used to select target areas and beneficiaries. These criteria should take into account exposure to risks, dependence on fishing, poverty, the effects of conflict, and historical gaps in service provision. Funding allocation results should be published, and independent grievance and monitoring mechanisms should be established.

5.8 Strengthen Regional Cooperation in the Red Sea

Yemen and its coastal communities should participate more actively in regional cooperation frameworks related to Red Sea fisheries and the blue economy. This should include sharing data on fish stocks and climate risks, as well as coordinating efforts to combat illegal fishing. Traditional fishers, fishing associations, researchers, and representatives of coastal communities should participate in relevant decisions. They should also have fair access to funding, training, and technologies that support adaptation. This cooperation should be accompanied by financial and technical support from countries with greater capacity and greater responsibility for climate change, directed towards communities that have contributed least to the problem but suffer disproportionately from its consequences.