In the name of God

The Role and Importance of Neritic Tuna Fishing in I.R. Iran's Fisheries

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Abstract:

Neritic tuna fishing plays a crucial role in the livelihoods of coastal communities and is considered one of the valuable opportunities for developing employment, income, and the long-term and sustainable exploitation of marine resources in line with responsible fishery practices pursued by the country's fisheries management. Approximately around 6,500 fishing crafts are involved in neritic tuna fishing, contributing significantly to the country's aquatic production.

In 2022, Iran's total aquatic product output was estimated at 1,352 thousand tonnes, with 751 thousand tonnes from marine capture fisheries. Of this, 282 thousand tonnes were tuna, tuna-like species and billfishes, including 129 thousand tonnes of neritic tuna, predominantly caught by small-scale coastal fishers using methods like gillnetting, trolling, and longlining.

Neritic tuna species, such as longtail tuna, Narrow-barred Spanish Mackerel, and Indo-Pacific King Mackerel, are vital for the socioeconomic stability of coastal communities. To ensure the sustainable and responsible exploitation of these resources, Iran has implemented several management and operational programs. These include data collection enhancements, training on how to complete and submit the Indian Ocean Tuna Commission (IOTC) new forms via the e-MARIS system, species identification guidelines, analyzing catch composition and the status of tuna bycatch and discards, and compliance with IOTC resolutions.

Key management strategies focus on adjusting and reducing fishing efforts to balance harvest levels and sustain tuna stocks. Every year, efforts are made to adapt and implement the recommendations of the IOTC in Iran, with a focus on identifying suitable areas for implementation that will involve the cooperation and participation of the fishing community. Continuous education and training programs are also integral to improving fishing conditions and ensuring the long-term sustainability of neritic tuna stocks.

This paper assesses the effectiveness of these management measures, evaluates the trends in neritic tuna fishing, and discusses the implications for future policy and practice to enhance the sustainability and productivity of Iran's tuna fisheries.

Introduction

Tuna stocks within the Indian Ocean constitute a critical component of marine biodiversity and demonstrably underpin the region's vital fisheries sector. These economically and ecologically significant tuna species serve as the foundation for both large-scale commercial operations and small-scale artisanal fisheries. Ensuring the long-term sustainability of these tuna populations in the Indian Ocean is of paramount importance, given their substantial contribution to global tuna markets and the socioeconomic well-being of coastal communities.

Neritic tunas constitute a distinct subgroup within the broader classification of tuna species in the Indian Ocean. Unlike their oceanic counterparts, neritic tunas are found in the relatively shallow waters of the continental shelf and nearshore zones. This group includes key species such as the Longtail Tuna (*Thunnus tonggol*), Narrow-Barred Spanish Mackerel (*Scomberomorus commerson*), Kawakawa (*Euthynnus affinis*), Frigate Tuna (*Auxis thazard*), Bullet Tuna (*Auxis rochei*), and Indo-Pacific King Mackerel (*Scomberomorus guttatus*). These species are integral to the coastal fisheries of numerous Indian Ocean rim countries, serving as a crucial source of both food and income. Studying neritic tuna populations is essential for developing effective management strategies to ensure their sustainability in the face of escalating fishing pressures and environmental changes.

The global population of neritic tuna has witnessed a concerning decline in recent years, primarily driven by overfishing and other human activities. In response to this challenge, Regional Fisheries Organizations (RFOs) and relevant stakeholders have implemented various measures to promote the conservation and sustainable management of these tuna stocks.

Total fishery and aquaculture production

Iran's fisheries production is bifurcated into two main sectors: aquaculture and marine capture fisheries. Each sector entails distinct social and technical considerations tailored to their specific operational needs. The fishing communities, which make up a significant portion of the population in the coastal regions of the Caspian Sea, Persian Gulf, and Oman Sea, have consistently been a focal point of attention and sensitivity in fisheries management plans.

In 2022, Iran's total fish production amounted to 1,352,257 metric tonnes. Of this, 718,307 metric tonnes (representing 53% of the total) were derived from the Persian Gulf, Oman Sea, and High Seas; around 32,515 metric tonnes (2% of the total) were sourced from the Caspian Sea; and 601,435 metric tonnes (45% of the total) were produced through aquaculture (*Fig. 1*).

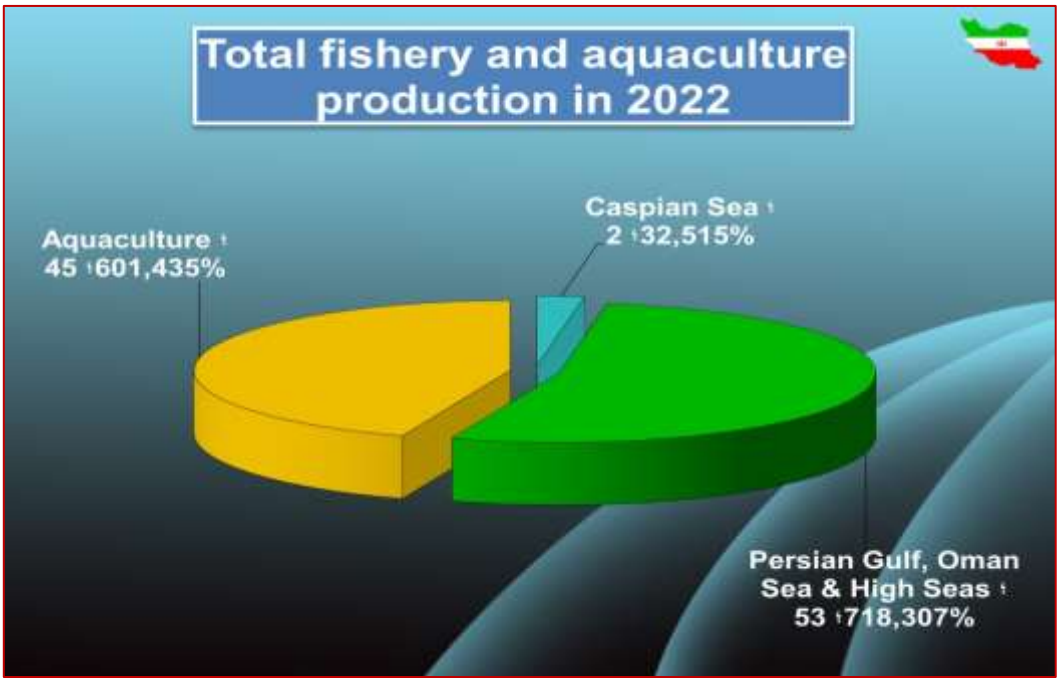


Figure 1: Total catch & production of Iran in 2022

Marine capture fishery (Iranian southern Fisheries)

The following chart (*Fig. 2*) illustrates the trend in total catch harvested from the Persian Gulf, Oman Sea, and High Seas from 2001 to 2022. The data reveal an overall upward trajectory, reaching a peak of 731 thousand tonnes in 2018. However, this was followed by a slight decline to 673 thousand tonnes in 2021. The upward trend resumed in 2022, primarily driven by an increase in the catch of small pelagic species.

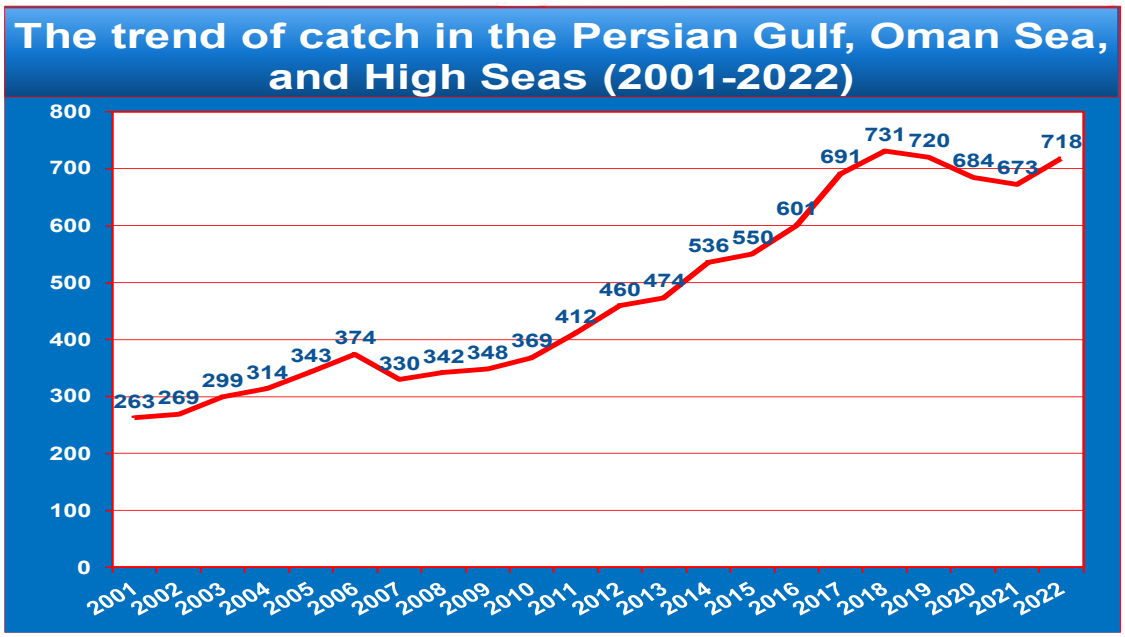


Figure 2: Trends in catch data for Iranian Southern Fisheries (2001-2022)

(*The Persian Gulf, the Sea of Oman, and the high seas*)

The provided pie chart (*Fig. 3*) offers a detailed breakdown of the 2022 catch by species group. Large pelagic species constitute the largest segment, accounting for 345 thousand tonnes (48%) of the total catch. Demersal species represent the second-largest segment, comprising 228 thousand tonnes (32%). Small pelagic species account for 138 thousand tonnes (19%) of the catch, while shrimp make up a minimal portion, totaling only 7 thousand tonnes (1%).

This pie chart serves as a valuable resource for stakeholders in the fishing industry, elucidating the composition of the 2022 catch by species group. It highlights the dominance of large pelagic species, followed by demersal species. Small pelagic species also constitute a significant portion of the catch, while shrimp represent a minimal share. This data is crucial for informing the development and implementation of effective management and conservation strategies.

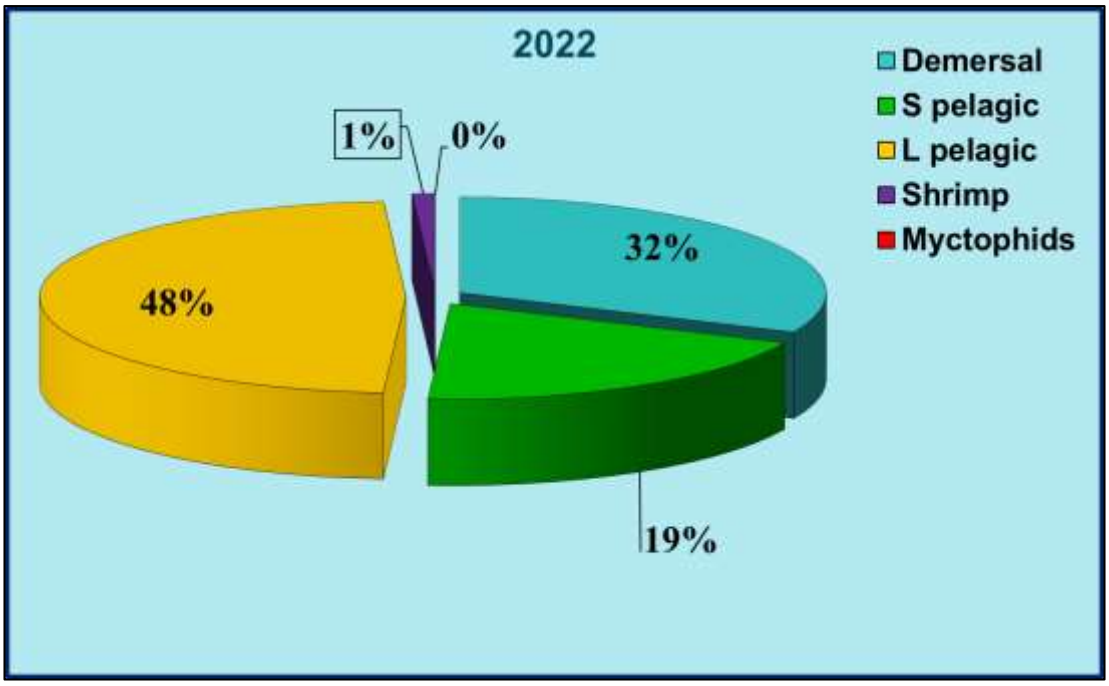


Figure 3: Catch by species group (The Persian Gulf, the Sea of Oman, and the high seas) (2022)

The illustrated line chart (*Fig. 4*) depicts the trend in the catch of various species groups in the Persian Gulf, Oman Sea, and High Seas from 2001 to 2022, offering valuable insights into the performance of the fishing industry in these regions. The chart demonstrates an overall increasing trend in the catch of large pelagic, small pelagic, and demersal species over the years, indicating successful harvesting efforts for these groups.

However, the catch trend for shrimp and myctophids has remained relatively stable over the years. Notably, since 2019, there has been a decline in the catch trend for demersal species, decreasing from 283 thousand tonnes to 228 thousand tonnes in 2022. Similarly, the myctophids catch rate experienced a significant drop, plummeting from 31 thousand tonnes in 2019 to zero in 2022, primarily due to the implementation of a seasonal ban on this species.

These trends can be attributed to various factors, including changes in environmental conditions, fluctuations in market demand, and the implementation of new fishing regulations. It is essential to closely monitor catch trends for each species group, particularly in these regions, renowned for their rich and diverse marine ecosystems.

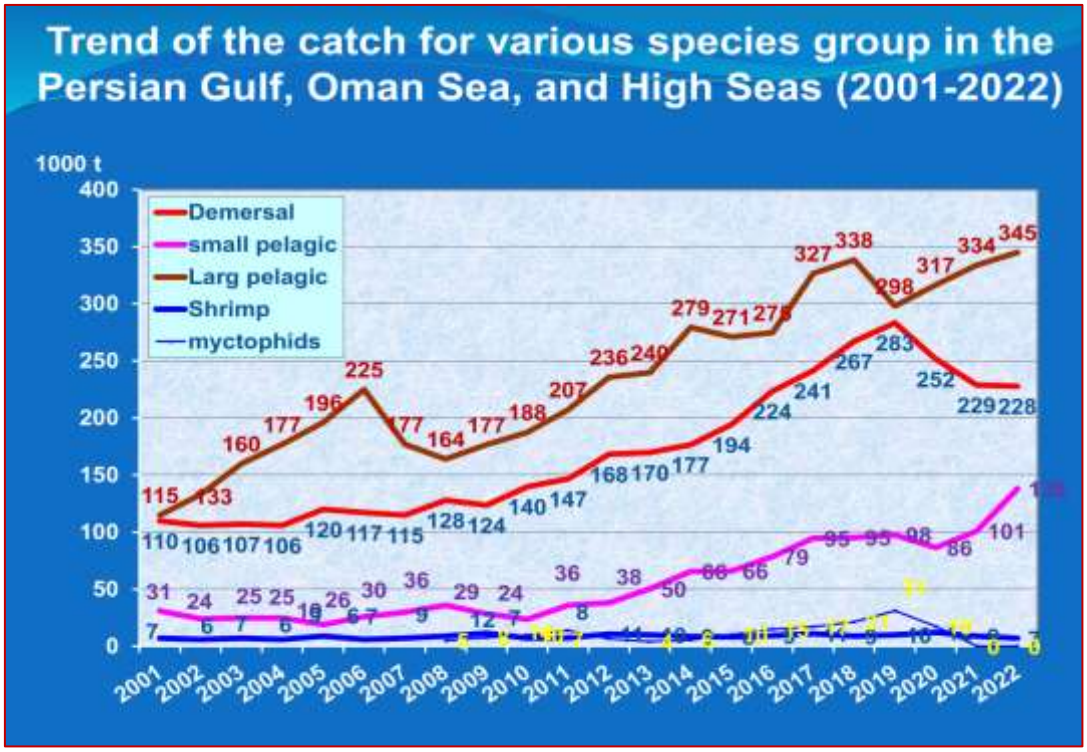


Figure 4: Trends in Catch for different species groups (2001-2022)

Fishing cooperatives

Fishing cooperatives play a crucial role in the conservation and management of fisheries resources. Beyond their conservation duties, these cooperatives are responsible for promoting the social and economic welfare of their members. Cooperative members share the responsibility of ensuring the sustainable use of fish stocks and protecting marine ecosystems for future generations.

Cooperatives offer members training and educational opportunities to enhance their fishing skills and knowledge, as well as loans and other financial assistance for purchasing or upgrading fishing equipment or covering operating costs. To fulfill these responsibilities, fishing cooperatives must collaborate closely with government agencies, NGOs, and other stakeholders to implement effective management measures, such as catch limits, gear restrictions, and time-area closures.

In order to collect data on catch, size, and effort, they collaborate with field samplers at designated landing centers.

However, the Iran Fisheries Organization (IFO) controls and monitors the function of these fishery cooperatives. Currently, around 173 fishing cooperatives are operating in Iranian southern fisheries.

Fishing gear and fleet structure

The fishing methods employed in Iran to target large pelagic species include gillnetting, purse seining, traditional longlining, and trolling by small boats in coastal fisheries. Notably, the gillnet fleet is primarily composed of locally made wooden and fiberglass vessels.

a. Total No. of fishing vessels in Iranian southern fishery

The total number of fishing vessels in Iran's southern fisheries is approximately 10,797. Among these vessels, 7,294 are boats, 3,381 are dhows, and 122 are industrial fishing ships. About 6,500 vessels are involved in tuna fishing activities. The number of fishermen directly participating in Iran's southern fishing activities is approximately 126,594 individuals.

b. Total No. of fishing vessels engaged in tuna and tuna-like fishery

In 2022, approximately 6,500 fishing vessels were engaged in catching large pelagic species within the IOTC area of competence. This fleet comprised 248 gillnet dhows over 100 GT, 477 gillnet dhows between 51 and 100 GT, 550 gillnet dhows between 3 and 50 GT, and 3,416 gillnet fishing boats under 3 GT. Additionally, 1,808 trolling boats under 3 GT, equipped with outboard engines, participated in day-long coastal fishing operations. Table 1 displays the number of fishing vessels categorized by gear type and vessel capacity.

Table 1: Number of Fishing Vessels Operating in the IOTC area by fishing Gear

GEAR GROUP	CAPACITY (GT) t	NO. OF Fishing Vessels
Purse seine	500 to 1000 t	
	> 1000 t	
Total Purse seine Fishing Vessels		0
Coastal Artisanal Longline (Seasonal & Temporal)	< 3 t	492
	51 to 100 t	85
	100 to 200	0
	> 1000 t	1
Total Coastal Artisanal Longliners		578
Gillnet	< 3 t	3,416
	3 to 20 t	247
	21 to 50 t	303
	51 to 100 t	477
	> 100 t	248
Total Gillnet Fishing Vessels		4,691
Trolling	< 3 t	1,808
Total No. of Fishing Vessels		6,500

In 2022, approximately 577 gillnet fishing dhows operated as longliners. These vessels were not included in the total count of fishing vessels due to their seasonal and temporary nature, operating exclusively during specific fishing seasons.

The following bar chart (*Fig. 5*) provides information on the number of fishing vessels by gear type and vessel capacity for 2022, showing that the majority of vessels engaged in catching large pelagic species were relatively small gillnet dhows. Around six thousand 5 hundred fishing vessels were engaged in this activity, with the majority being smaller vessels under 3 GT. Additionally, there were several seasonal gillnet fishing dhows active as longliners, not included in the overall count of vessels, operating only during certain fishing seasons.

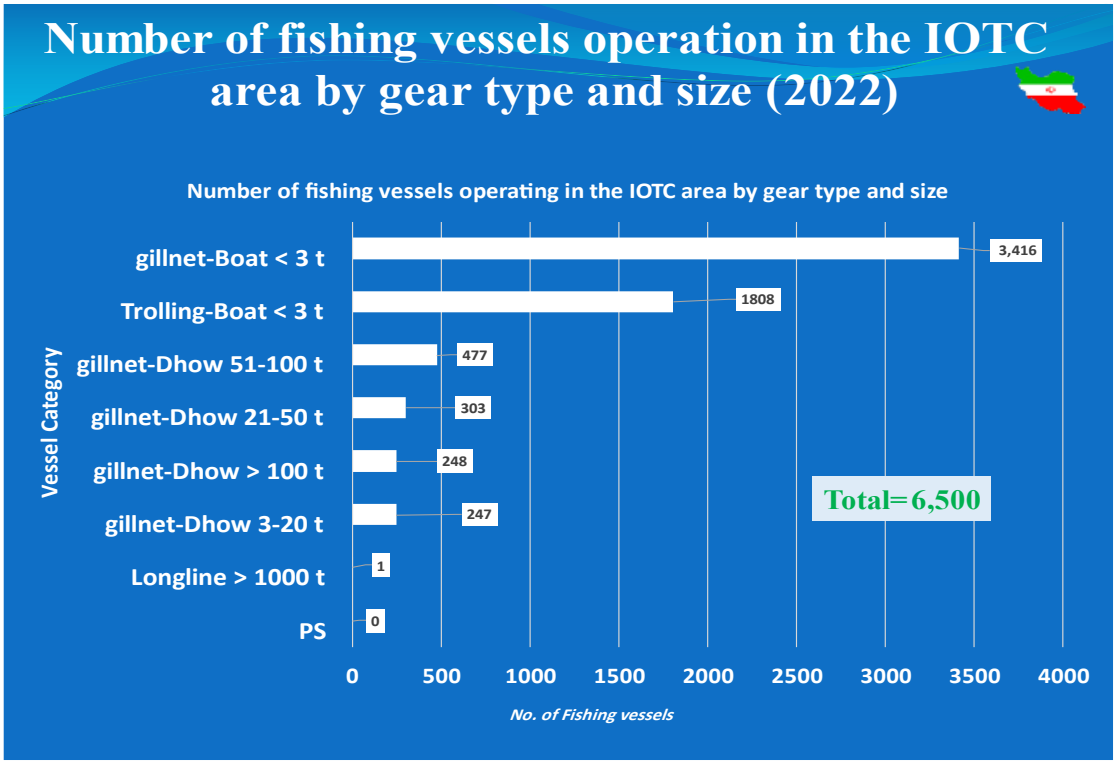


Figure 5: Number of fishing vessels operating in the IOTC area by gear type and size (2022)

Catch and Effort data (By gear and Species)

In this study, catch and effort data were gathered from 68 designated landing centers along the southern coast of Iran. A stratified random sampling technique was utilized to ensure the representativeness of the data across the entire fishing fleet. Approximately 10% of the fishing vessels, encompassing various types of dhows and boats, were randomly chosen, and their fishing data were obtained via questionnaires administered by trained field samplers.

Furthermore, the duration of fishing trips at sea is documented within the data collection software for all operational fishing vessels. These records are raised based on the total fishing effort.

There are dedicated scientific capture fishery statistics committees at both provincial and national levels, comprising fishery research experts and administrative officers as members. These committees assess and ultimately endorse the methods and outcomes of data collection and analysis.

Fishing effort management

There is mounting concern regarding the escalating fishing effort and the potential for overfishing of these species. Fishing effort encompasses the extent of fishing activities, including the frequency of fishing expeditions and the types of fishing gear employed. Excessive fishing effort can precipitate a decline in fish populations, thereby exerting substantial ecological and economic ramifications.

To mitigate the impacts of fishing effort on neritic tuna populations, Iran has enacted several conservation and management measures. These include imposing restrictions on engine power and vessel dimensions in accordance with the Vessel Replacement Guidelines, enforcing a 20-day moratorium on all fishing activities by vessels across provincial fishing grounds, instituting seasonal fishing bans for certain neritic tuna species like Narrow-barred Spanish Mackerel (COM), and implementing a Fishing Effort Management Plan in designated areas of fishing grounds to regulate and adapt fishing efforts. This plan will entail overseeing and adjusting the operations of different vessel groups within the active fishing fleet.

Moreover, various measures have been implemented to reduce fishing pressure in specific regions. These measures encompass limiting the number of vessels authorized to operate in designated areas, regulating the deployment of fishing gear, shortening fishing seasons, decreasing the number of fishing days, enlarging the mesh size of fishing nets, and advocating for the adoption of selective fishing methods that specifically target desired species. Implementing these measures aims to ensure the sustainable management of neritic tuna populations and secure the long-term viability of the fishing industry, which heavily relies on these resources.

The table 2 presents a summary of the annual fishing effort for large pelagic species conducted by different types of fishing fleets, such as purse seine, gillnet, traditional longline boats, and trolling, spanning from 2013 to 2022.

Annual fishing effort for large pelagic species by various types of fishing fleets

GEAR GROUP	Capacity GT	Fishing effort by gear(days)									
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Purse seine	500 to 1000 t	0	0	0	0	0	0	0	0	0	0
	>1000 t	450	981	727	1,164	1,085	715	811	401	376	0
Total Purse seine fishing effort		450	981	727	1,164	1,085	715	811	401	376	0
Coastal_Artisanal_ Longline **	< 3	0	0	0	18,000	19,440	24,300	20,000	34,000	45,000	49,200
	51 to 100	0	0	0	3,200	6,600	14,025	11,040	9,520	16,800	29,520
	100 to 200	0	0	0	560	560	1,190	1,200	0	0	0
	>1000	0	0	0	0	0	0	0	0	0	0
Total Coastal_ Artisanal_Longline ** fishing effort		0	0	0	21,760	26,600	39,515	32,240	43,520	61,800	78,720
Gillnet	< 3 t	515,372	557,434	538,550	487,646	438,046	516,149	496,736	764,432	541,066	568,892
	3 to 20 t	100,809	43,303	40,985	41,682	43,035	44,779	37,392	43,369	77,334	46,606
	21 to 50 t	176,132	195,643	184,070	74,870	58,114	51,045	47,178	44,594	60,629	63,268
	51 to 100 t	82,637	91,293	91,790	30,337	54,873	52,410	40,029	36,904	93,199	100,245
	>100 t	45,020	57,662	60,400	50,530	59,746	69,535	75,343	72,941	46,197	52,129
Total Gillnet fishing effort		919,970	945,335	915,795	685,064	653,815	733,918	696,677	962,241	818,425	831,140
Trolling	< 3 t	139,161	125,446	123,450	229,190	196,440	224,708	258,713	133,500	127,260	135,740
Total Trolling fishing effort		139,161	125,446	123,450	229,190	196,440	224,708	258,713	133,500	127,260	135,740
Total all Gear fishing effort		1,059,581	1,071,762	1,039,972	937,178	877,940	998,856	988,441	1,139,662	1,007,861	1,045,600

Table 2: Annual fishing effort for large pelagic species by various types of fishing fleets (2013-2022)

Current Status of Tuna Fisheries in Iran

Tuna species constitute a primary component of large pelagic fisheries. They are characterized by their highly migratory behavior across regions. The catch from these species supports local fresh and frozen tuna markets, as well as the export and canning industries. Due to the significant role of tuna fisheries, it is essential to monitor their sustainability through comprehensive collection of biological, economic, and fisheries data. This data is crucial for conducting stock assessments aimed at evaluating the status of tuna stocks.

The graph in (*Fig. 6*) illustrates the trend in catch quantities for tuna and tuna-like species from 2001 to 2022. It shows a noticeable upward trajectory, with the catch tonnage rising from 94 thousand tonnes in 2001 to 282 thousand tonnes in 2022, marking a substantial increase over the period. This growth can be attributed to factors such as advancements in fishing gear and improved fishing practices.

The upward trend in catch reflects the fishing industry's success in employing modern techniques and equipment to efficiently capture tuna and tuna-like species. The graph offers valuable insights to stakeholders, including fishers, fisheries management authorities, and researchers, regarding the industry's performance over time. This information can be used to monitor and assess the effectiveness of existing conservation and management measures, thereby ensuring sustainable fishing practices.

Figure 6: Catch Trends of Tuna and Tuna-like Species (2001-2022)

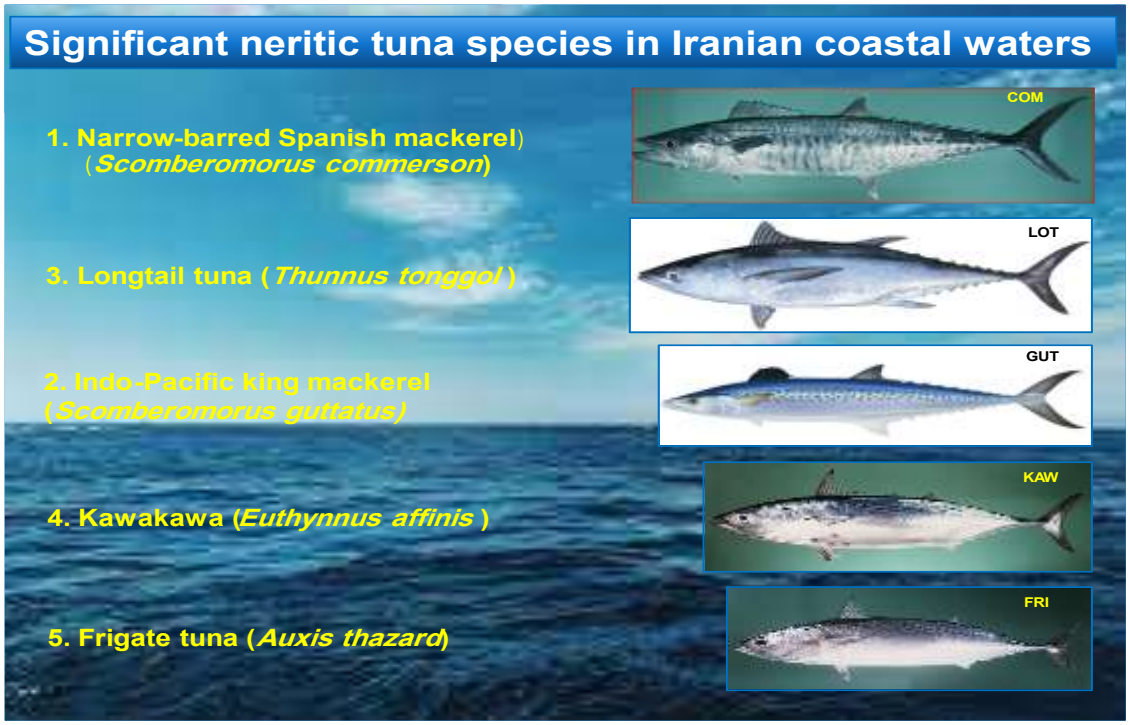
Overview of Neritic Tuna Stocks in Iran

The neritic tuna fishery is an integral component of Iran's fisheries, both economically and culturally. However, similar to many marine resources, overfishing and unsustainable exploitation practices have jeopardized this crucial fishery. To ensure the long-term sustainability of Iran's neritic tuna stocks, it is imperative to implement effective management measures. This paper will present an overview of the current state of neritic tuna fisheries in Iran, emphasize the necessity for sustainable exploitation management, and discuss the management measures that have been enacted. Furthermore, it will examine the challenges and strategies for enhancing management in the future.

Neritic tuna species

The catch of neritic tuna undeniably plays a vital role in sustaining the livelihood and social welfare of coastal communities. It significantly impacts employment, economic factors, and overall well-being.

The tuna species present in the various fishing grounds of Iran exhibit considerable diversity. The predominant species include Longtail Tuna (*LOT*), Narrow-barred Spanish Mackerel (*COM*), Kawakawa (*KAW*), Frigate Tuna (*FRI*), and Indo-Pacific King Mackerel (GUT).



Some of these species are processed in fish canneries, while others are consumed directly as food. The quantity of neritic tuna caught varies based on several factors, including the fishing method, season, and location.

The chart presented in (*Fig. 7*) illustrates the catch quantities of various tuna and tuna-like species in 2022. According to the data, Skipjack Tuna (*SKJ*) had the highest catch volume, amounting to 78,598 tonnes and representing 28% of the total catch. This was followed by Longtail Tuna (48,388 t) at 17% and Yellowfin Tuna (38,821 t) at 14%.

The catch rates for other tuna and tuna-like species were as follows: Kawakawa (*KAW*) constituted 13% of the total catch, Billfish accounted for 12%, Narrow-barred Spanish Mackerel (*COM*) represented 9%, Indo-Pacific King Mackerel (*GUT*) made up 4%, and Frigate Tuna (*FRI*) comprised 3%.

The smallest catch was recorded for Bigeye Tuna (*BET*), amounting to 1,016 tonnes, which represents 0.4% of the total catch. The significant disparity in catch quantities among different species underscores variations in market demand and the economic value of each species.

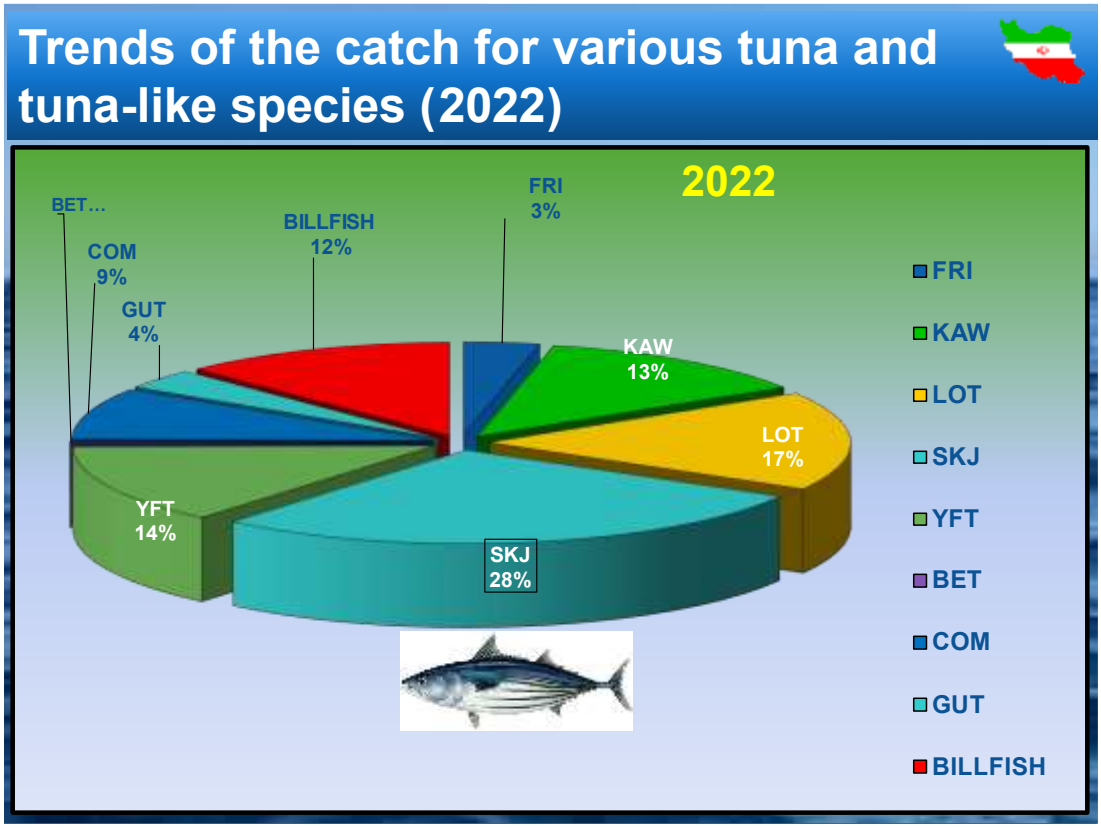


Figure 7: Trends of the catch for various tuna and tuna-like species (2022)

The graph in (*Fig. 8*) illustrates the catch trends for various neritic tuna species from 2001 to 2022. It is evident that the catch quantities for all neritic tuna species exhibited an upward trend over this period.

The majority of the catch comprised Longtail tuna (*LOT*), whereas Indo-Pacific King Mackerel (*GUT*) constituted the smallest portion. Kawakawa (*KAW*) ranked second in terms of catch volume, with Narrow-barred Spanish Mackerel (*COM*) following closely in third place. Additionally, the catch quantity of Frigate tuna (*FRI*) approximately matches that of Indo-Pacific King Mackerel (*GUT*).

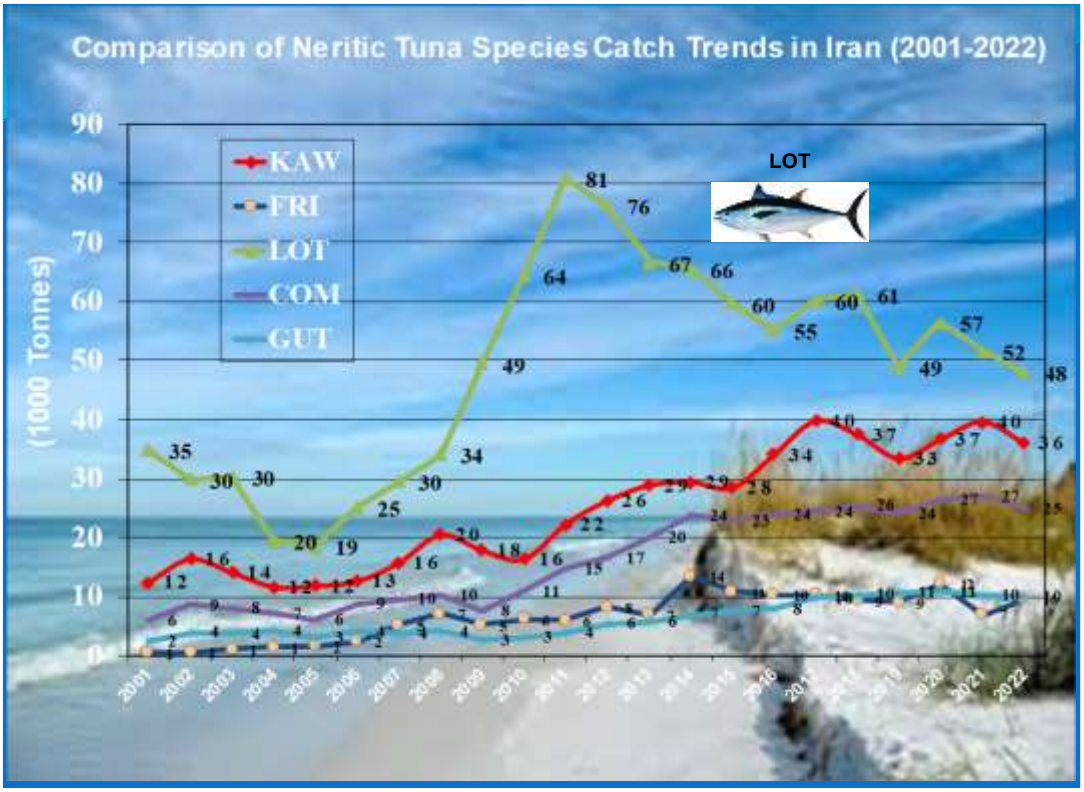


Figure 8: comparison of neritic tuna species catches trends in Iran (2001-2022)

The following graph (*Fig. 9*) depicts the catch trends for tunas. Over the studied period from 2001 to 2022, neritic tuna constituted a significant portion of the total tuna catch, comprising approximately 52%. In contrast, tropical tuna accounted for approximately 48% of the total catch during the same timeframe. The data indicates that despite an increasing trend in tropical tuna catch from 2012 to 2022, neritic tuna remained predominant in the overall catch composition.

The chart illustrates a notable surge in the quantity of tropical tuna caught between 2001 and 2006, peaking at 143 thousand tonnes in 2006. Subsequently, there was a sharp decline, plummeting to 46,000 tonnes by 2011. This decline is primarily attributed to the threat of piracy within the western Indian Ocean fishing grounds. As a result, there was a significant reduction in fishing activity targeting tropical tuna in these regions. Consequently, the catch of neritic tuna increased in Iranian coastal fishing areas as the fishing fleet redirected its efforts towards this species.

Piracy poses a significant threat to lawful maritime operations, resulting in disruptions to investments and the operations of fishing vessels.

Over the past two decades, piracy has extended into the High Seas regions, resulting in increased attacks on fishing activities, especially targeting fishing dhows in the Western Indian Ocean. Consequently, these dhows have shifted operations from the Western High Seas fishing grounds to Iranian coastal waters to mitigate the human and financial risks associated with piracy.

As a result of this strategic shift, there was a notable decrease in the fishing effort directed towards tropical tuna capture from 2007 onwards. Concurrently, the fishing fleet redirected its focus towards harvesting neritic tuna within Iranian coastal waters.

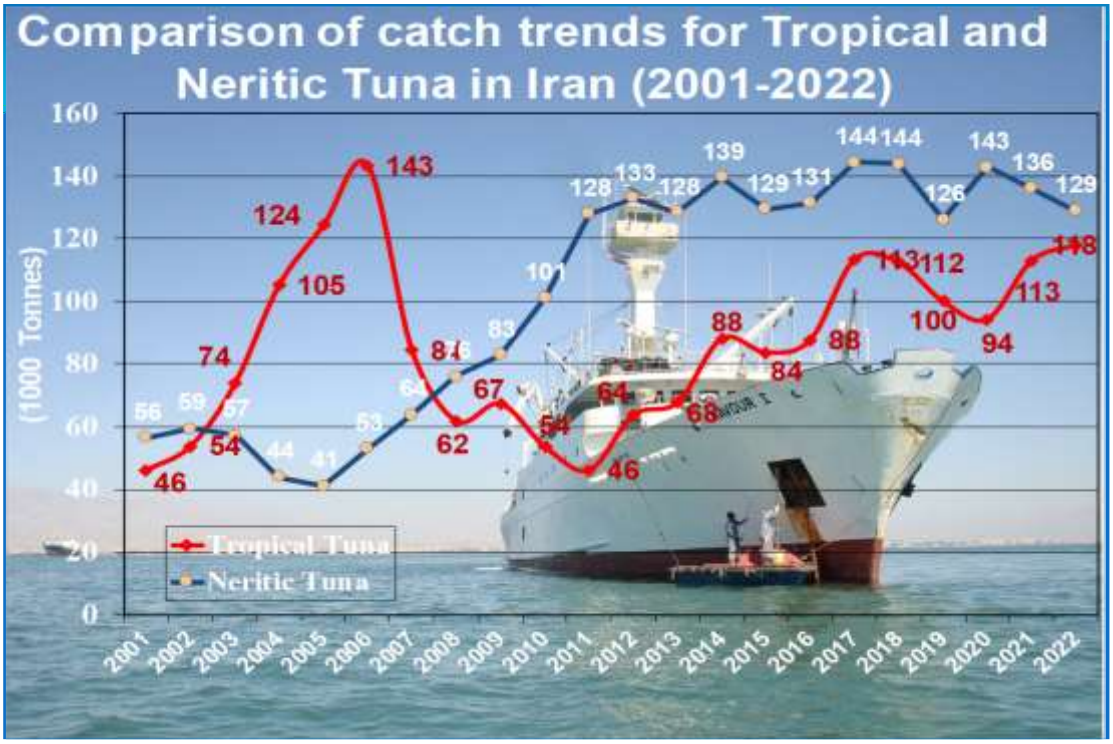


Figure 9: Comparison of catch trends for Tropical and Neritic Tuna in Iran (2001-2022)

Size data collection:

a. Importance of Size Data Collection

Gathering size data for neritic tuna is essential for comprehending their population dynamics, growth rates, and the repercussions of fishing activities on their stocks, thereby facilitating the formulation of robust tuna management approaches. This data constitutes a fundamental scientific resource underpinning the governance of tuna populations. Size data acquisition concerning neritic tuna is pivotal for illuminating aspects crucial to their conservation and sustainable management, as well as for informing resource management strategies effectively.

Size sampling must adhere to rigorous and well-defined random sampling protocols, essential for obtaining unbiased size data. Sampling efforts should ensure that at least one fish is measured per tonne caught, categorized by species and fishing method, with samples representing all fishing periods and areas comprehensively.

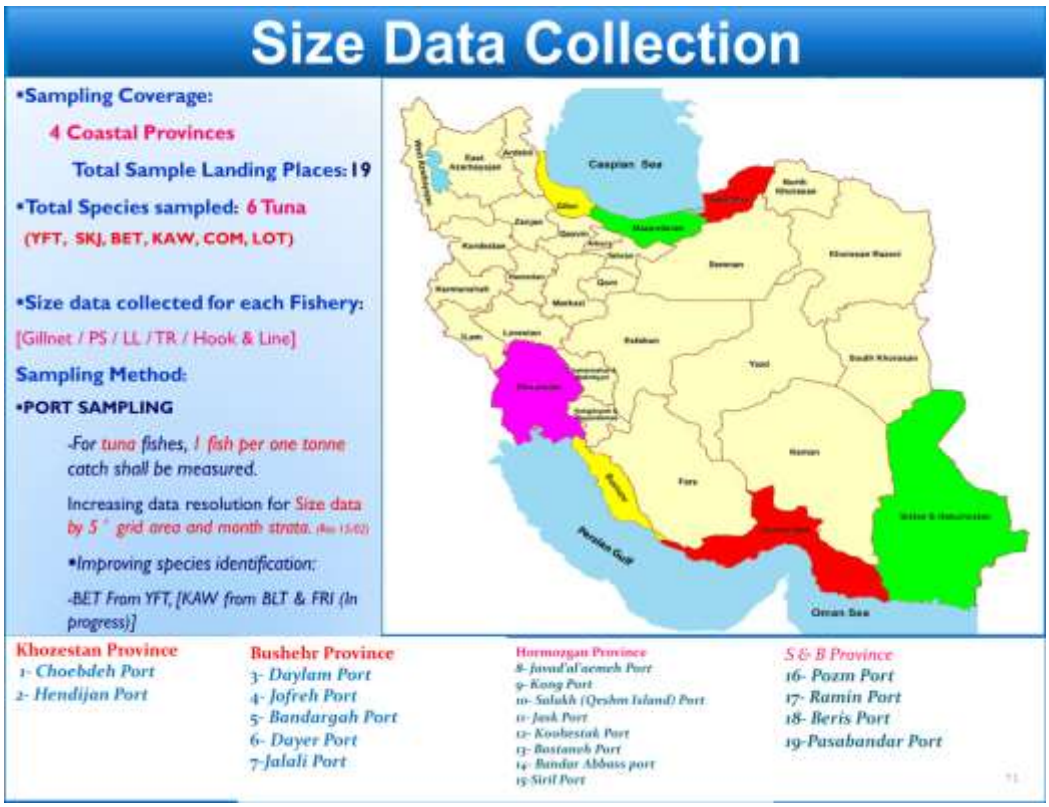
a. Current method for size data collection on neritic tuna in Iran

To enhance the evaluation of neritic tuna species in the Persian Gulf and Oman Sea, port sampling has been systematically implemented across four coastal provinces using a random sampling framework. Field samplers have collected size data at 19 designated landing centers, ensuring measurement of at least one fish per tonne caught, categorized by species and fishing method.

In our study, we employed the direct measurement approach. This methodology yields unbiased and precise measurements of size, crucial for accurately estimating population size and growth rates over temporal scales. Despite its time-intensive nature, direct measurement surpasses estimations derived from catch data in terms of accuracy.

Size data is acquired through the measurement of Fork Length (FL). Gaining insight into the size distribution of these tuna populations across diverse fishing gears is vital for proficient fisheries management and conservation endeavors. Data collection employs a range of fishing gears such as gillnets, hook-and-line, and longlines.

For precise estimations, particularly concerning larger fish and during spawning seasons, rigorous statistical analysis and sufficient sample sizes are indispensable for the effective collection of size data and the formulation of stock assessment models for neritic tuna species.



Sample landing centers for collecting length-frequency data of tuna species in the Persian Gulf and the Sea of Oman.

Conservation and management Measures Implemented in Iran

a. Regulatory Framework

Conservation and management strategies for sustainable utilization of neritic tuna stocks encompass various measures designed to mitigate fishing effort and managing the sustainable exploitation of these stocks. An essential strategy involves instituting catch limits and quotas to mitigate overfishing, thereby restricting the annual tuna harvest. To maintain optimal fisheries management, Iran has formulated a plan to reduce fishing effort by a number of fishing vessels, with the ultimate goal of enhancing the sustainable exploitation of tuna stocks.

Iran has introduced supplementary conservation and management measures, including regulations governing fishing gear and techniques, promoting selective methods like longlining and trolling, establishment of closed seasons, and oversight of fishing license issuance. These initiatives are designed to promote sustainable management of tuna populations and ensure the enduring sustainability of the fishing sector.

Hence, it is imperative to regulate the utilization of fishing gear to reduce incidental catch and enhance the selectivity of fishing methodologies. Currently, Iran is endeavoring to transition from gillnet to longline fishing techniques. This shift aims to advance sustainable and discerning fishing practices, thereby minimizing the capture of non-target species and safeguarding the broader marine ecosystem. In support and reinforcement of this strategy, Iran has been collaborating with the United Nations Industrial Development Organization (UNIDO) since 2017 on a joint project titled "Enhancing the Added Value of yellowfin tuna." This project is currently underway. Through the adoption of optimal practices in longline fishing and the enhancement of tuna product quality, Iran anticipates enhancing the attractiveness of its tuna offerings in global export markets.

Accurate recording of catch data is of paramount importance. Therefore, over the previous year, a series of training sessions were meticulously organized, focusing on the precise identification of tunas, billfishes, and shark species specifically tailored for our fishermen and field samplers, with a primary emphasis on tuna varieties. These sessions were instrumental in equipping our field samplers with the expertise needed to accurately discern species such as kawakawa and frigate tuna, among others. This initiative has significantly bolstered the precision of our catch data and reinforced adherence to sustainable fishing regulations. By sustaining investments in training and cutting-edge technology, we aim to further enhance our capacity to effectively steward these invaluable marine resources for future generations.

b. Monitoring and Enforcement

The Iranian fisheries organization has instituted a comprehensive monitoring and enforcement framework to oversee fishing regulations within its jurisdiction. This encompasses routine surveillance of landing operations and fishing fleet/s. Measures are being intensified to bolster oversight and regulation of tuna fishing activities, encompassing port inspections, monitoring of catch offloading, regulations governing fishing equipment, and other regulatory provisions within fishing zones.

Additionally, Iran has advanced its monitoring capabilities by outfitting select distant-water fishing vessels with a Vessel Monitoring System (VMS).

Stringent penalties are enforced for breaches of fishing regulations. Measures are actively pursued to address infractions occurring within the tuna fishing sector, overseen by a dedicated commission tasked with handling such violations. This commission also administers deterrent policies and, in cases of repeated violations, refers cases of non-compliance to judicial authorities for further action.

The key actions are currently underway

- Adapting and customizing the Indian Ocean Tuna Commission (IOTC) requirements and approvals to conform with Iran's specific implementation conditions and policies.

- Fostering increased participation and engagement of fishing cooperatives, Regional Fisheries Organizations (RFOs), and stakeholders in the management processes of tuna fisheries.

- The Iran National Tuna Commission (INTC) has been established and engages with all relevant government agencies and stakeholders in its sessions, utilizing their consultation, collaboration, and expertise.

- Organizing a workshop on sustainable exploitation management of tuna stocks.

- Efforts are underway to coordinate the implementation of the pilot project for pole-and-line fishing in Iran, in collaboration with a local university.

- Promotion and advancement of longline fishing (for Longtail Tuna) and trolling (for Narrow-barred Spanish Mackerel) methods for neritic tuna species.

- The integrated fishing management system is an extensive web-based database of fishermen. While certain components of the system are currently operational, others are still under development, with programmers actively working to finalize these remaining features. Planned functionalities include an electronic system for issuing fishing licenses, a comprehensive database encompassing all active fishing vessels, and a robust data collection, processing, and reporting mechanism. Moreover, the system will integrate with the fishermen's insurance system, the Ports and Maritime Organization system, the Port State Control System for monitoring the departure and arrival of fishing vessels, among other features. Upon full deployment, the system will facilitate real-time updates on fisheries management activities.

Challenges in the management of the neritic tuna fishing sector

• The issue of multi-species and multi-gear fishing, and the tendency of fishermen to relatively increase fishing effort.

• Non-standardized fishing gear (Unauthorized or illegally modified fishing equipment)

• Incidental catch of non-target species and illegal fishing practices

• Socio-economic factors influencing overfishing

• Effects of climate change on tuna populations

• Marine pollution and environmental concerns

Collaborative Approaches to Management

Collaborative management strategies, encompassing co-management and community-based approaches, entail the distribution of responsibility and decision-making authority among diverse stakeholders. This stakeholder group includes fishing communities, research institutions, governmental bodies, fishermen, and other community representatives. Such collaborative approaches have demonstrated success in attaining sustainable fisheries management. This is achieved by incorporating local expertise and practices into the management plans, thereby ensuring that all stakeholders have a vested interest in the long-term sustainability of the fishery.

Iran's fisheries management framework has demonstrated a pronounced emphasis on cultivating the active engagement of pivotal stakeholders in the tuna industry. This stakeholder group encompasses fishermen, fishing cooperatives, and other entities involved in tuna processing. The incorporation of these key stakeholders into the decision-making process has enabled Iran to leverage their localized knowledge and expertise towards the management and conservation of tuna stocks.

A prominent initiative has been undertaken to harness the capacities and collective strength of the tuna fishing community through the establishment and operationalization of the "Hemmat Fishing Group". This initiative's Persian counterpart is promoted under the title "Hamkaran-e Mardomi" (People's Collaborators). This entity represents a network of public-private partnerships dedicated to tuna fishing activities. This initiative is anticipated to play a pivotal role, particularly in the sustainable stewardship and conservation of neritic tuna fisheries within Iranian territorial waters.

In addition to the establishment of the 'Hamat Fishing Group,' another notable initiative aimed at promoting sustainable tuna fisheries management is the symposium titled 'Responsible Tuna Fisheries Management: A Symposium Focusing on Enhancing the Added Value of Tuna Fish.' This symposium was held last year and brought together experts, policymakers, and industry stakeholders to discuss strategies for enhancing the value of tuna products while ensuring responsible fishing practices. The symposium highlighted the importance of collaboration among all sectors of the tuna industry to achieve sustainable tuna fisheries management.

Strategies and Recommendations for Strengthening Conservation and Management of Neritic Tuna Species

Neritic tuna species serve as a vital economic and livelihood resource for numerous coastal nations, and the implementation of appropriate management measures is essential to ensure their long-term sustainability. Effective management strategies for neritic tuna fisheries necessitate a multifaceted approach encompassing scientific research, collaborative decision-making processes, and robust enforcement mechanisms to guarantee the sustainable utilization of this economically and ecologically significant resource. Some key recommendations for management measures targeting neritic tuna species include:

Coastal tuna fisheries serve as a vital economic and livelihood resource for many coastal countries, playing a significant role in the lives of coastal communities.

1. Maintain essential workshops facilitated by the Indian Ocean Tuna Commission (IOTC) and associated entities, focusing on stock assessment methodologies, species identification, as well as training courses tailored for observers and field samplers. These workshops should emphasize data collection protocols and statistical analysis, with specific reference to relevant IOTC resolutions and recommendations. This will ensure the sustained development and refinement of these critical skills among the stakeholders involved in the monitoring and management of neritic tuna fisheries.
2. Enhance Public Awareness: Undertake initiatives to educate the public about the significance of sustainable fishing practices and the imperative to safeguard neritic tuna populations. This should involve targeted outreach to fishermen, consumers, and other relevant stakeholders, in addition to implementing comprehensive public education campaigns.
3. Advocating the use of selective fishing techniques, such as longlining and pole-and-line methods, which target specific fish species and minimize the incidental catch of non-target species (bycatch).
4. Implementing economic and social development initiatives to facilitate the transition of fishermen towards more environmentally sustainable fishing practices.
5. Effective management, control, and adjustment of fishing effort in the tuna fleet to optimize performance.
6. 1. Enhancing export opportunities through the implementation of a plan to maintain the quality of harvested tuna.

The end