Economic prosperity through Pakistan Marine Fishery: Opportunities and Challenges

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Abstract

Marine fishery plays a significant role to boost economy and it is a vital source of nutrition especially for the local population. Pakistan's Exclusive Economic Zone (EEZ) is a great source of living and non-living resources and, over the period of 73 years, the country's marine fishery sector has made considerable progress. Pakistan is presently exporting fish worth US$ 350 to 400 million per year. However, optimum exploitation of this domain with value addition can fetch more to the national exchequer. This study examines the current state of resources related to marine fishery, analyses the steps taken by the government to improve this area of blue economy, and based on the outcomes proposes a set of recommendations for a consistent and coherent growth of this sector.

Keywords: Marine fishery, Exclusive Economic Zone, blue economy, export

Introduction

Marine Fishery is one of the most important components being considered for economic development of any maritime state. In 1947, a limited fishery infrastructure was available at Karachi harbor without fish processing plants. Pakistani waters have rich marine life and precious species with substantial marketable value. About 760 species of fish are available in Pakistan's territorial waters along the coasts; out of which, "114 fish species carry huge economic value, if exported after proper preservation and with value addition can add to national exchequer. However, Pakistani fish exports compared to world export is only 0.25%" (Nazir, Yongtong, Kalhoro, & Memon, 2015).

Hence, Pakistan has substantial potential to improve fish export and take advantage of this valuable economic resource. Fisheries in Pakistan are managed by the Marine Fisheries Department, which is responsible for planning, policy making and coordination with relevant national and international organizations. The said department also looks after the marine side of fishing. Although few universities have

also taken interest in conducting fisheries research, but no independent research center is established along the coast, which is desperately required. Pakistan's coastline consists of many bays along the mouth of Indus delta where marine species grow owing to ideal breeding environment (Shahzad, 2020). Karachi, Pasni and Gwadar are bigger fish harbors with several other small fishing jetties along the coast, while, 12 nautical miles from the coast is the major fish catchment area. Pakistan's fishing industry is blessed with naturally enriched locations for marine life and has massive potential to augment the fragile economy of Pakistan. Hence, this paper aimed to make critiques to explore economic prosperity through Pakistan marine fishery while highlighting the Opportunities and Challenges.

Exploitation of Marine Resources of Pakistan's Exclusive Economic Zones (EEZ)

Over 290,000 Km^2 of sea area possesses huge potential of living and non-living marine resources in Pakistan. As per recent estimates, the seafood industry of Pakistan is worth US$ 2.8 to 3.5 billion with proper value addition; presently fish exports receive around US$ 400 million per annum. Fishery Industry contributes approximately 1 percent to national GDP. Around 1.5 million people living in coastal areas of Balochistan and Sindh are presently employed/ attached with marine fishery industry.

Out of the total fish catch, some 10 percent is exported, while 60 percent of it is used to produce fish meal, and the remaining 30 percent is locally consumed. Marine fish catch is 445,000 metric tons per year approximately, from coastal waters of the country. The need of the hour is to protect and manage the rich marine recourse. The blessings to Pakistan marine fishery came when the 200 NM area of Pakistan's EEZ was extended by UN in 2015 (Shahzad, 2020). "The United Nations Commission on the Limits of Continental Shelf accepted recommendations for extension of the outer limits of continental shelf of Pakistan. The opportunity to extend outer limits of continental shelf under Article 76 of UNCLOS- 82 was achieved in time by Pakistan. But the triumphant leap came after efforts extending over decade and a half. In the process, Pakistan became the first country in the region which had its continental shelf extended to 350 NM" (Khan, 2006).

Lower production from aquaculture is among few reasons that per capita consumption of fish in Pakistan is at about 10% of global

average as compared to over 20 kg per person in the year 2019. Consumption of fish remains at lowest in Pakistan, with 1.9 kg per person per annum. Multiple inefficiencies, constraints and anomalies in the value of fish chain are witnessed as hindrances for the development of aquaculture. Following are the three main constraints:

1- Inadequate sanitary conditions in fish handling and distribution
2- Low and seasonal domestic fish consumption
3- High production costs for existing fish farms

Literature Review

Alder et al., (2008) stated fisheries as an important natural resource for economic development. Despite having an adequate potential for the development of fisheries, many governments even in the developing countries do not give due attention towards the improvement of this sector. Formulating a framework and effective strategy, to bring fisheries to the desired extent, may result into positive outcome which will enhance the productivity of fishing sector. In accordance with the statement of Centre for International Earth Science Information Network (CIESIN) 2012, appropriate fisheries management results in increased economic growth, poverty alleviation and food security.

Amman et al., (2020) say that aquaculture is now a very important sector because of its extraordinary potential for phenomenally increasing domestic protein supply in Pakistan; despite the small contribution it makes to the national economy. Fisheries provide direct and easy employment to around 400,000 fishermen and the number of people working in related industries goes to around 600,000. Annual production from fisheries is approximately 0.6MMT (million metric tons) which includes 63% of marine and 37% of inland catch. Pakistan has approximately 193 species of fish that belong to freshwater, whereas 800 other marine species are also found in the country.

Froese et al., (2012) concluded that fishing gear and its use should be modernized to get the most out of it. They explain that despite advancements, fishermen still use old versions of fishing gear which results in inadequate fish catch whereas, Vijayan et al., (2000) stressed the use of better fishing gear and its effective use. He believes that fishermen use inappropriate fishing gear which results into mismanagement of fishing. Use of appropriate fishing boats coupled with right time and place can give advantage in the catch of fish. When

suitable boats with contemporary techniques are used, the productivity is enhanced manifold.

Nazir (2015) expresses the importance of exploration of natural resources and their export to support national economy. The actual natural resource in the fishing industry is distinct kind of fish stock. In order to have proper fish management, it must be ensured that fish species are properly protected and preserved. Out at sea, these resources are finite however, adequate stocks measurement of these resources can pave the way for better growth in marine fishery which can lead to economic prosperity.

Shahzad (2020) states that seas and oceans are the destination of maritime economies around the globe after land scarcity is slowly eating up land accumulation. Maritime economies are futuristic, and they have found refuge in 'Blue Economy'; a modern maritime economic strategy, ready to be exploited and become an integral part of the existing global economic system. Shahzad adds that EEZ of Pakistan can phenomenally benefit the country and can help shaping its economy.

Zeller et al., (2006) mentioned that literate fishermen and their ethical behaviors are significant for protection and productivity of marine resources. They refrain from catching small and juvenile fish species and abide by the right practices. But, unfortunately in Pakistan, most of the fisherman community is illiterate; which proves to be the mother of all troubles.

Significance of Study

This research will help in developing an understanding as to how the existing potential of fishing industry can be improved for the economic benefits and to find out the challenges being faced by Pakistan's marine fishery industry. New avenues of fish mapping, exploration and export are being critically analyzed in this article. These avenues will help fishermen community in setting the right direction. However, lack of relevant training and non-availability of modern fishing gear and equipment is a hindrance towards better fishing in Pakistan, which will add significant value if available. Therefore, the study is contemporary in nature and all departments of fishing industry, including the administration, and fishing community, may get benefit to further address their shortcomings. Hence this research may be taken as a benchmark by the policy makers, academia and relevant stakeholders

while crafting the future policies and research.

Methodology

The mixed method was used for conducting this research, and both qualitative and quantitative sources were exploited to examine and analyze the state of marine fisheries in Pakistan. The data was collected from different domestic and international sources, i.e., books, research and newspaper articles, governmental documents, surveys, and conference proceedings and reports. Where applicable, the data is presented using tables and static graphs. The study is longitudinal and addresses the problematics of several points in time. For the recommendations section, Pakistan's current economic state, and rate of growth in the fisheries sector was taken into consideration.

Pakistan Marine Fishery

Fish is a preferable diet because of low fat and low calories, and it is highly digestible and full of proteins. It contains proteins, 8 essential amino acids, Sulphur (including Methionine, Lysine, and Cysteine), Fats, soaked oily acids and it is therefore the primary source of polyunsaturated fatty acids. "Two omega-3 fatty acids found in fish are EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). Our bodies don't produce omega-3 fatty acids so we must get them through the food we eat. Omega-3 fatty acids are found in every kind of fish, but are especially high in fatty fish. Some good choices are salmon, trout, sardines, herring, canned mackerel, canned light tuna, and oysters" (WSDH, 2020).

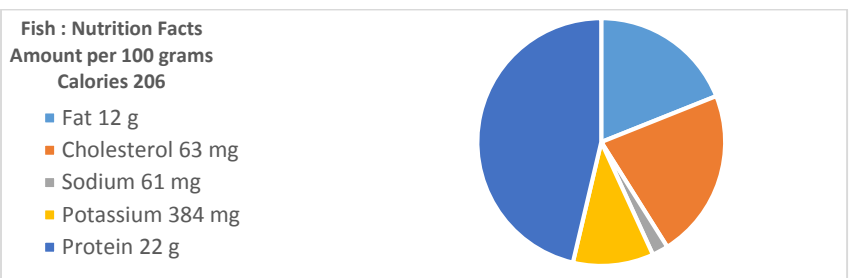

Figure 1: **Fish Nutrition facts,** adapted from **the** U.S. Department of Agriculture

Owing to continuous burst of population in Pakistan and inland food scarcity, fisheries require extraordinary attention by respective authorities. Marine Fish out at sea continuously being exploited using traditional vintage boats that lack modern techniques and technology.

It is pertinent to mention that Fishermen community cannot upgrade their fishing boats and related gear without financial support from governmental / non-governmental organizations. Contribution from public and private sector to fishing industry with their appropriate financial support, have attained true and sustainable progress. Lack of required finance to fishing sector hinders achievement of optimal fish catch. "To increase the existing resource base and catching techniques, research in fisheries sector is also desperately needed. Modern technology has the potential to enhance current low yield and may suggest new methods to protect the environment" (Israel, 1999).

Most Pakistani fishermen live in coastal villages and conduct fishing operations along the coasts of Sindh and Balochistan. Effective and efficient operation depends upon various factors like target species, location of fishing base, type of fishing boats, season, market condition/ access and demand etc. while Period of fishing at sea depends upon the type and kind of fishing boats used. Nonetheless, smaller fishing boats (Kati, Rachin, Toni and small Horas) under take daily trips along the Sindh creeks and coastal villages to catch fish. Fishermen proceed to the sea in the morning time and return back in the evening or vice versa. Other boats have been designed to undertake fishing trips spanning a few days. Gillnet / line fishing is a key to operate boats in Pakistan. These boats usually stay at sea for three to seven days. In the prevailing Pakistani environment, preservation of fish at sea is a challenge; as most boats either have no preservation facility or lack in standard preservation facilities. Upper decks of boats are used to place fish catch. Majority of the fishing boats belong to villages and coastal towns and do not have appropriate facilities for the preservation of fish. Generally, fish is placed on the deck, in wicker baskets or they store fish below the deck, to protect the catch from the sun. Specific facilities for protection from the sun are not available in these fishing boats.

Large vessels proceed to sea for two weeks or more. Therefore, fish preservation is very important for which ice is used. Unlike advanced countries where sorting of fish catch is undertaken in freezing rooms aboard the fishing vessels, Pakistani fishermen store fish of all types at one place. In some cases, the costly fish like soles, shrimp, Pomfret, lobsters, groupers, croakers and other fishes are separated and are kept in wicker baskets and preserved by using ice.

Trawlers and gill-netters are big boats which have commonly six to eight compartments inside the boats therefore, Tanki boxes are also fixed in these boats. The fish is stored in the compartments and ice is placed on the fish for effective preservation.

Fish landing jetties are at Karachi, Korangi, Ibrahim Hyderi, Keti Bandar, Pasni, and Gwadar while areas with Karachi Fish harbor is the largest in the country. Other areas have no fish landing jetties along the entire coast of Pakistan. Currently 4000 fishing boats are based in Karachi fish harbor against the designed capacity of 1000. Attributable to illiteracy and problems in management, and available facilities are not judiciously used. During offloading, placement and auction processes a hefty amount of fish is deteriorated. Keeping in view the poor economic condition of fishermen in general, there is a need to provide financial support to fishermen community in an organized way. Normally, maintenance of boats is done by using loans from both formal and informal sources. However, formal loans sanctioned by the government for construction of boats and undertaking repair and up- gradation works of boats are available to a minute fraction of fishermen community. Private sector loans also have no specific structure. Private Banks sanction loans to fishermen on high mark-up rates.

The exact mapping of marine fishery assets inside Pakistan's Exclusive Economic Zone is not known as yet. The accessible information is additionally found on mere supposition. It portrays the presence of immense supplies of living and non-living assets. Marine fishery evaluation data requires classy apparatus, hardware and sensors for stocks underneath the oceanic waters. Marine fishery is divided in different zones as proclaimed by the department of Marine Fishery. Fishing, on beach fronts, is confined within 12 NM from the coast in two areas of Balochistan and Sindh, while the Federal Government of Pakistan manages the rest of these zones. These regions are divided into the following three zones:

- Zone 1 *(12 NM)*
- Zone 2 *(12-20 NM)*
- Zone 3 *(20-200 NM)*

For the most part, Zone 1 and 2 are reserved for locals; no remote ocean fishing vessels are permitted to work in these zones. In Zone 3, remote ocean fishing vessels, at most 1000 GRT, are permitted to work

according to remote ocean fishing strategy. However, since 2005, no remote ocean fishing boat is active in the Pakistan's EEZ, and therefore, since 2006, no Tuna long liner activity is recorded. Near Sir Creek, the security situation in the Indus Delta is delicate, which requires Pakistan's Marines to keep round the clock watch as Pakistani fishermen face harassment and danger from neighboring country. Also, fishermen from India continuously try to conduct illegal fishing in Pakistani waters. All this is handled effectively by Pakistan Maritime Security Agency (PMSA). Officials of PMSA keep Indian fishermen away from conducting their illegal fishing activities in Pakistani areas. In addition to this, "PMSA performs Search and Rescue Operations, pollution control activities and coastal patrolling for anti-smuggling and it keeps Pakistani shores safe from Illegal weapon, drugs and human trafficking" (Shahzad, 2020).

In 1947, Pakistan's capacity of export of fisheries was Rs 2.86 million which reached US $ 325 million in 2019.

Table 1: Marine Fishery Resources of Pakistan

Fish Type	Bio-Mass (in tons)	Total Potential (in tons)
Pelagic Species (Small)	700,000	201,153
Pelagic Species(Large)	80,000	20,715
Demersal Species	500,000	32,015
Shrimp	88,000	-
Molluscs	8,000	3,375
Cephalopods	20,000	5,475
Crabs	10,000	320
Lobster	1,300	-
Mesopelagic	10,000000	5,000,000

Source: **Data adapted from PMFD "Pakistan Marine Fishery," Government of Sindh, (2020): http://livestocksindh.gov.pk/.**

Pakistani fishery products mostly failed to meet the European standards because of poor handling and bad hygiene, so a ban on import of Pakistani fishery products was imposed in 2007 by the European Union (EU). However, the ban was lifted in 2013 by the European Union when some boats were upgraded. Still there is a need to enhance protecting handling, hygienic conditions and to upgrade more fishing boats as per EU standard to avoid export banning in future. Situation can be assessed from the fact that only 27 fish processing plants are currently in operation in Pakistan and the others are either non-operational or outdated and old. Out of these plants, 29.6

percent are for fishmeal, while 70.4 percent are freezing plants (SLD, 2020).

Pakistan requires attention towards effective extraction of fish for the local use. The recorded fish consumption is at the lowest in Pakistan and it is highest in Sri Lanka, in South Asia. In Pakistan, about 26 percent of the total fish catch was consumed as food locally. Accordingly, yearly per person supply of fish food was recorded at 1.6 Kg whereas per capita supply and consumption, in 2020, was 1.9 Kg (LFD, 2011).

Pakistan's export of its sea-food products is not at its entire potential. It is estimated that around 359,534 MT of sea-food products is produced by Pakistan; out of which 130,358 MT was set for export that worth US $325 Million. If materialized totally, this export is able to fetch an additional amount of US$ 2.5 to US$ 3 billion per annum. Out of the total fish production harvested in Pakistan, "71% (is) are exported annually. In Balochistan it was found that there has been an increase in fish, shrimp, lobster and cuttle fish processing plants from 10 to 39 since last three years (until 2017). Trawlers use nets catching fish in deep-sea and from entire lot, only 10% of, the catch is kept for processing and commercial use, while 90% of the dead fish are waste (d) back into the sea" (Aftab, Naseem, Ameen, & Safda, 2017).

Development and Export of Marine and Inland Fish/Fish Products from 2016-2020

During 2016-17 (July-March), complete marine and inland fish catch was assessed at 520,000 MT. Middle East, China, Malaysia, Sri Lanka, Thailand, Japan, and the United States remained big buyers of fish and fishery items (GoPFD, 2017).

The quantity of fish and fishery items export had expanded by 21.6 percent and value increased by 10.5 percent during the fiscal year 2017-18 (July-February) (GoPFD, 2018). Several measures were taken to upgrade, enhance and develop fish sector by Pakistan's federal government.

During 2017-18, tests of seawater gathered from waterfront regions were investigated to assess fish growth and appropriation. Tests were analyzed on length-weight relationship, sex proportion, development, food, and stock position were additionally calculated at Karachi Fish Harbor (GoPFD, 2018). Following measures were taken to enhance fisheries capability, production, and growth:

i. Quality Control

Marine Fisheries Department (MFD) manages quality and advance fare of fish and fishery items. In this regard, MFD gave 19,848 endorsements of Health, Quality and related items during the fiscal year 2017-18.

ii. Turtle Excluder Device (TED)

TED is used to lessen the entanglement of ocean turtles in shrimp fish nets and shielding the job of nearby angler. The utilization of TED is obligatory and Pakistan Maritime Security Agency guarantees consistence of US guidelines to ensure TED on all shrimp fishing vessels.

iii. Fishing Fleet Development and Modernization

Because of presentation of particular boats by Marine Fisheries Department in January, 2008 the boat proprietors have begun adjustment of their boats at their own costs. This is an example of overcoming adversity which shows that the angler network has acknowledged the innovation of covering of fish holds of fishing boat with fiber glass covering. Following measures were taken to upgrade fishing boat fleets by Marine Fisheries Department:

- Boats were checked as per the guidelines of European Union Standards
- Certificates were issued for one year only
- 1,368 fishing boats including Trawler, Gillnetters and Horas were changed/ redesigned
- EU Standards in boat checking were maintained in the use of wood/fiberglass etc.

iv. Remote Ocean Fishing

No remote ocean fishing vessel was in activity during the fiscal year 2017-18 (July-February).

v. Fare of Fish and Fishery Products to the EU Nations

After the export, of fish and fisheries products, to EU nations was resumed, there had been an effective clearing after 100% lab examination at EU outskirts. During fiscal year 2018-19 (July-March) Pakistan exported fish and related products for up to US$ 293.887 million (RS 39,245 million). Besides this, different projects were initiated under the “Prime Minister's Agriculture Emergency Program” for the fiscal year 2018-2019, (GoPFD, 2019) details of which are given as under:

A. Shrimp Farming Project

Project was estimated to cost Rs.4, 842.78 million for 5 years, and key targets recognized are the following:

i. To promote shrimp hydroponics
ii. Generation of export profit from shrimp hydroponics
iii. Livelihood and employment creation

B. Fish Culture Project

The project's cost was RS 6,856.87 million for 5 years which includes the following objectives:

i. Best use of normal marine related assets
ii. Up-scaling cultural innovation across Pakistan
iii. Increase per capita fish utilization

C. Trout Farming in Northern Areas of Pakistan Project

Venture cost is RS 2,291.97 million and the key targets recognized are:

i. Promotion of inland trout reproduction
ii. Promotion of Fish business

D. Renewal of Fish stocks

Fisheries sector, in contrast with the previous year, during FY2019-20 (July-March), saw a development of 8.0 percent. Fares of export of fish to China expanded by US$ 87.6 million (81.5 percent), as compared to US$ 48.3 million during fiscal year 2018-19. Export of fishery products to the EU during the fiscal year 2019-20 is recorded in table 2 appended below.

Table 2: Fish / Fishery Products, Export to European Union

Belgium	Netherlands	Spain	Italy	UK
26 percent	19 percent	26 percent	9 percent	20 percent

Source: **Data adapted from Finance Division "Fisheries," Government of Pakistan, (2020): https://bit.ly/2VCQhDc.**

Covid-19 has impacted almost all the industries and their growth mechanism especially in developing countries during the year 2020. However, structure of fish exports from Pakistan has seen a marginal difference as shown in table 3 appended below.

Table 3: Fish & Fishery Products Exports Structure

July-March ($Million)			July-March Quantity		
2018-19	2019-20	Percent Change	2018-19	2019-20	Percent Change
293.9	317.3	8.0	129704	133226	2.7

Source: **Data adapted from Finance Division "Pakistan Economic Survey 2019-20," Government of Pakistan, (2020): https://bit.ly/2VCQhDc.**

In Pakistan, the subject of Maritime Affair/Marine Fishery is not a specific part of the syllabi in academic institutions. However, a few universities offer a peripheral discourse on 'Marine Biology'. Comprehensive facilities for research on maritime affairs are not yet available in Pakistan. National Institute of Oceanography and Pakistan Hydrographic Department lack modern equipment and machinery. As a result, academically trained and skilled manpower is not available in the country. Learning fishing is still conducted through traditional and conventional means; hence the knowledge passes through elders to their children. Government of Pakistan had been putting efforts to systemize and develop fisheries sector by proper legislation but there is a need for more coordinated efforts. In this regard, governmental instructions and acts linked to fisheries are stated below:

1. Balochistan Sea Fisheries Act No. IX of 1971
2. Pakistan Animal Quarantine Ordinance, 1979
3. Sindh Fisheries Ordinance, 1980
4. Karachi Fish Harbor Authority Ordinance, 1984
5. Pakistan Fish Inspection & Quality Control Act, 1997
6. Pakistan Environmental Protection Act, 1997
7. Pakistan Fish Inspection & Quality Control Amendment, 1998
8. Pakistan Fish Inspection & Quality Control Rules, 1998

Development of Fish Ports

The main fisheries base in Balochistan at Pasni harbor has almost finalized its revitalization and renovation to recommence seafood catch processing and export. The shortest seafood transfer to Oman will aid Balochistan to receive extra exchequer and to retain fish trafficking to Iran. Once Pasni is developed as 'fish city', the economic, social and anthropological condition of the area will be transformed. With the help of China, a new city can be developed as China Pakistan Economic Corridor (CPEC) has promised uplift of underdeveloped area of Balochistan. New port in Gwadar is also coming up very well

with the help of Chinese management and the Gwadar Fish Harbor which is part of this scheme. It will be shifted to the new location as the present site of Gwadar fish harbor will be merged with the expansion of the port. The Gwadar Fish Harbor will be constructed by 2025 to its new location but close to the port with modern equipment and machinery. "The first model Special Economic Zone (SEZ) will be developed at Gwadar under (US) $ 62 billion China Pakistan Economic Corridor. It will spread over an area of 3,000 acres" (Shahzad, 2020). It will greatly help to up lift the preset state of Pakistan's marine fisheries growth and development and incidentally the local fishermen will have widening benefits.

Table 4: CPEC Projects: Gwadar, Balochistan

Project Title	Estimated Cost (US$ million)	Percentage of Investment
Gwadar East-Bay Expressway	168	24
New Gwadar International Airport	230	33
Construction of Breakwaters	123	18
Dredging of berthing areas & channels	27	4
Development of Free Zone	32	5
Pak China Friendship Hospital	100	14
Pak-China Technical and Vocational Institute at Gwadar	10	1
Gwadar Smart Port City Master Plan	4	1

Source: **Data adapted from Finance Division "CPEC Gwadar Projects,"** CPEC: Ministry for Planning, Development & Special Initiatives**, (2020): http://cpec.gov.pk/gwader.**

Subdivision of Pakistan Marine Fisheries

The waterfronts and foremost key facts with their regional position and virtual rank are shown in table 5.

Lack of awareness in maritime affairs, especially in marine fishery, is an obstacle towards effective use of marine resources. Department of Marine Fishing has planned day to day drills databases for fishermen on contemporary fishing technique / harpooning gear etc. to upsurge invention of fish and shrimp construction, to boost fish/shell fish construction and to intensify the growth of fish.

Table 5: Fish Mooring Facts/Marinas

	****H	***H	**	*
Sindh	Karachi	Korangi	Ibrahim Haidery Kaitee Bandar Shah Bandar Kharo Chaan Jatthi Jhungi Sur Badeen	Shams Pir Lath Basti Hawks Bay Coast Manjhar Sonari Mubarrak Village
Balochistan	Gwadar Pasni Ormara	Gaddani Jiwani		
Legend: H = Fish Harbor | * Meets Local User Requirement | ** Important | *** Very Important | **** Most Important				

Source: **Data adapted from Finance Division "Fishery and Aquaculture Country Profile," Food and Agriculture Organization of the United Nations, (2009): http://www.fao.org/.**

Challenges to Pakistan Marine Fisheries

Following are the challenges faced by Pakistan fishing industry.

1. Maritime sector does not possess trained and adequate manpower which is an obstruction in the development of maritime sector, especially marine fisheries.
2. Pakistan's political leadership has mostly ignored the fisheries sector.
3. Marine environmental degradation due to excessive pollution contributes to the problem.
4. Owing to the absence of sustainable marine development programs, the fishermen community remains unaware of modern ways, techniques and researches.
5. Absence of maritime culture and tradition in Pakistan is a bigger issue. Owing to this, the consumer of fish in Pakistan remains an ignorant consumer.
6. Destruction of marine ecology due to rising sea level is a climatic hurdle.
7. Lack of planning and systemic organized campaigns for awareness about marine fisheries is a challenge faced by the industry since the very beginning.

8. There is a lack of coordination among bureaucracy, academia, and media regarding development of marine fishery sector.
9. Marine Scientific Research (MSR), at local level, is insufficient. It includes seismic surveys, charting and mapping of sea bed and oceanic resources in the EEZ of Pakistan. There should be a proper synergy among countrywide think tanks and research institutes such as NIO, NIMA, Marine Science Department of Karachi University, Lasbela University of Agriculture, Water & Marine Sciences, and Minhaj University Lahore etc.
10. Lack of road networks for speedy transport and insufficient number of refrigerated conveyance pose dangers to the items which require proper and timely storage.

Major Findings

Pakistan's maritime sector is the core of country's economy if utilized properly. As the sector of marine fisheries is constantly undergoing progress and change due to the economic benefits which modern countries are harnessing for becoming 'Blue Economy', Pakistan needs to revamp its direction and planning. Total assets of Pakistan's marine fishery are unknown and a comprehensive data is unavailable, so its scope for both producer and consumer of marine fishery remains wide and open for research and development. Present marine fishery industry of Pakistan is not futuristic, and because of this, exploitation of resources, benefits and prospects of value addition, at local as well as international level, remain stagnant.

Conclusion

The weakening in the maritime fishery is mainly due to inadequate techniques, overfishing and lack of modern gear and equipment. It is essential that laws are formulated to address today's requirement for inland and marine fisheries and a long term policy is developed that can benefit both the fishermen communities and the people linked to fish trade, transport and export. The governmental think tanks and academia should combine to form a futuristic collaboration to address the challenges faced by the marine fishery and to practice the principles that can take Pakistan towards becoming a better Blue Economy hub. The marine fish catch and export can be increased manifold with a little attention of the public and private sectors. Government needs to pay little attention to uplift fishing harbors,

landing sites and hygienic conditions. Export of fish after value addition can fetch more for the national exchequer.

Recommendations

It is recommended that the focused attention towards improvement of fisheries management by the respective governments of coastal provinces should be conducted. Modern boats and state-of-the-art fishing gear in the fishing community may be introduced on priority. Moreover. this fish resource protection measures are required to be taken by controlling overfishing and marine pollution. Uplift of marine fisheries-related infrastructure along with the guidance and financial support to fishermen community needs to be essentially ensured on priority. Research and development mechanism for marine fisheries must be improved by involving universities and dedicated R&D setups.

It is strongly recommended that the present functional capacity of the gear used by the fishermen for marine fishery is properly and fully assessed. A comprehensive compilation of recommended modern gear for marine fishery along with the development of a related learning environment for local fishermen will help to improve the capacity, workflow and growth of the fishery products.

Further, to improve the determinants of marine fisheries, dedicated studies in fisheries management, fishing boats and their effective use, fish literacy and ethics, proper fish resource protection and fisheries infrastructure are essential. Currently, a 'Pakistan specific study' of fisheries value addition is not available. The said study will help encourage local and foreign investors to become parts of this growing industry.

For sustainable growth, 'EU Standards' of marine fishery are the key to success in this industry. An extensive policy can be devised to develop infrastructure for marine fishery, to meet climatic and environmental standards out at sea and to establish and a coherent and harmonized system of governmental departments for the enhancement of marine fishery.

There is a need to study and practice better ecological standards to create a balance between the climate and the ocean so that overexploitation of fish and other marine products can be stopped, and better growth can be harnessed through available resources without endangering the environment.

Awareness about Maritime fishery industry is the need of the hour, but it can be done effectively only through public-private partnership. Sustainable maritime fishery development can only be achieved through a coherent mechanism between academia, local development sector, trade authority and media.

To boost the sector of Pakistan's marine fishery, Gwadar port can serve as the launching pad. Priority should be given to its development and infrastructure modernization. It will not only take the country's geographic and economic importance to the next level but will also impact marine fishery sector, especially in Balochistan and the fishermen may take advantage of technological advancement and modernization of Chinese fishery industry. As part of the CPEC project, marine fishery industry of Pakistan can be further developed.

As China is seeking prospective reach through maritime activities, the Maritime Silk Road (MSR) will be of foremost significance for Pakistan's marine fishery. Gwadar, Bin Qasim and Karachi ports are integral parts that essentially project Pakistan's connection to the MSR but, there is a need to develop more ports to constructively support marine fishery and local fishermen. It will not only make the maritime industry grow and create chances for more foreign direct investment, but also generate employment opportunities for Pakistani nationals in marine fishery sector.

Pakistani ports have the potential to serve the neighboring countries such as Iran, Afghanistan, and Central Asian states, for their 'fish catch and trade' interests. The access of the neighboring countries to the Arabian Sea, especially from Gwadar and Karachi, will boost 'regional collective economy'. Pakistan can explore its true maritime fishery potential through Special Economic Zones which can incidentally serve the purpose of making the country's economy sturdy and stable.

Pakistan's EEZ, for the comprehensive development of maritime fisheries, is required to be restructured: its preservation, protection and demarcation lines of breeding fish and conservation and capacity should be redefined and its development mechanism, reach and scope should be revisited and clearly described. There is a dire need to enhance the local academic and research activities for the collection of data regarding Pakistan's maritime zones and fishery resources.

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