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Report of Policy Lab on Bridging Gaps in Agriculture Development Policies and their Implementation in Pakistan

پاکستان میں زرعی ترقی کی پالیسیوں کے اطلاق میں حائل رکاوٹوں کا خاتمہ

Policy Analysis & Recommendations- Part-2 of 11

Development of Fisheries Sector

Examined strategies to modernize fisheries, improve sustainability, and enhance exports.

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

إِنَّ اللّٰه لَا يُغَيِّرُ مَا بِقَوْمٍ حَتَّىٰ يُغَيِّرُوا مَا بِأَنفُسِهِمْ

(سورة الرعد 13:11)

بے شک، اللہ کسی قوم کی حالت نہیں بدلتا جب تک وہ خود اپنی حالت کو نہ بدلے۔

Indeed, Allah does not change the condition of a people
until they change what is in themselves.
(Surah Ar-Ra'd 13:11)

ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي النَّاسِ لِيُذِيقَهُمْ بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ

(سورة الروم 30:41)

خشکی اور تری میں فساد ظاہر ہو گیا ہے، لوگوں کے اپنے ہاتھوں کے کیے ہوئے اعمال کی وجہ سے، تاکہ اللہ انہیں ان کے کچھ اعمال کا مزہ چکھائے، شاید کہ وہ باز آ جائیں۔

Corruption has appeared on land and sea because of
what the hands of people have earned, so that
He may let them taste part of what they have done,
that perhaps they will return (to righteousness).
(Surah Ar-Rum 30:41)

Development of Pakistan's Fisheries Sector

Examined strategies to modernize fisheries, improve sustainability, and enhance exports

Research Group

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- Nasr Ullah
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PREFACE

Agriculture remains the backbone of Pakistan's economy, providing livelihoods to a significant portion of the population and contributing substantially to the nation's GDP. However, despite its potential, the sector faces persistent challenges related to productivity, resource management, and international trade. In response to these pressing issues, a ***Policy Lab*** simulation exercise titled **"Empowering Agriculture for Food Security and Economic Growth: Implementation Strategies in Pakistan"** was conceived, designed, and mentored by **Dr. Muqeem Islam Soharwardy**. This Policy Lab initiative aimed to generate actionable policy recommendations through an intensive, research-based simulation exercise complemented by a two-day seminar.

The ***Policy Lab*** research exercise, conducted between **14th and 18th February 2024**, involved nine specialized research groups, each focusing on critical aspects of agricultural policy. These groups simulated high-level policy interventions, functioning as dedicated task forces and committees under the guidance of subject matter experts. Their work culminated in a comprehensive set of recommendations aimed at addressing structural inefficiencies and unlocking new growth avenues in Pakistan's agricultural sector.

The a Policy Lab research groups were structured as follows:

1. **Expanding Trade Opportunities by Unleashing Pakistan's Milk Export Potential** – Focused on identifying barriers to dairy exports and proposing strategic interventions to enhance Pakistan's competitiveness in the global dairy market.
2. **Development of Pakistan's Fisheries Sector** – Examined strategies to modernize fisheries, improve sustainability, and enhance exports.
3. **Increasing Pakistan's Share in International Halal Meat Export** – Explored pathways to leverage Pakistan's strength in halal meat production for greater penetration in international markets.
4. **Provision of Quality Fertilizer to Enhance Productivity** – Investigated fertilizer supply chain challenges and policy measures to ensure the availability of high-quality inputs for farmers.
5. **Provision of Quality Seeds to Enhance Productivity** – Assessed Pakistan's seed industry, highlighting reforms needed to boost agricultural yields through high-quality seeds.
6. **Promoting Water Conservation in Agricultural Practices** – Addressed the critical issue of water scarcity by proposing conservation techniques and policy interventions for sustainable irrigation.
7. **Increasing Pakistan's Share of Fruit Exports** – Focused on expanding Pakistan's footprint in the global fruit market through improved production, value addition, and trade facilitation.

8. **Evaluation of Implementation Strategies of Food Security in Pakistan** – Analyzed the effectiveness of existing food security policies and proposed comprehensive strategies for improved implementation.
9. **Increasing Availability of Agricultural Credit** – Examined the role of financial institutions in supporting farmers and proposed mechanisms to enhance access to agricultural financing.
10. **Climate-Smart Agriculture**, Food Security, and Sustainable Land & Water Management explored innovative solutions for sustainable agriculture and resource management
11. **Agricultural Mechanization & Innovation –** Promoting modernized agriculture through mechanization, crop diversification, and precision farming.

Through rigorous research and a ***Policy Lab*** simulation, this exercise sought to foster a deeper understanding of the challenges and opportunities in Pakistan's agricultural sector. The insights and recommendations derived from these working groups will serve as a valuable resource for policymakers, stakeholders, and researchers striving to enhance agricultural productivity, food security, and economic growth in Pakistan.

We extend our gratitude to all participants, researchers, and experts who contributed to this initiative. Their dedication and intellectual rigor have resulted in a policy framework that holds the potential to transform Pakistan's agricultural landscape and position the country as a leading player in global agricultural markets.

We extend our gratitude to all participants, researchers, and experts who contributed to this initiative. Their dedication and intellectual rigor have resulted in a policy framework that holds the potential to transform Pakistan's agricultural landscape and position the country as a leading player in global agricultural markets.

It is hoped that the recommendations and findings herein will contribute to **evidence-based policymaking, institutional capacity-building, and long-term agricultural growth**, ultimately fostering **national food security and economic stability**. انشاءالله.

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February 23, 2024

Executive Summary

Pakistan's Fisheries Sector: Current Challenges and Strategic Recommendations

The global aquaculture sector has been growing at a remarkable rate of over 10% annually, fueled by increasing demand for seafood due to its high nutritional value. This has created vast opportunities for growth, particularly in countries with abundant water resources. Pakistan, with its long coastline and extensive inland fisheries, has substantial untapped potential in the fisheries sector. Despite these resources, the sector's contribution to Pakistan's GDP remains minimal, with significant barriers preventing its growth and full utilization.

This study delves into the fisheries sector, identifying challenges, examining institutional structures, and proposing strategies to boost aquaculture productivity, enhance value-added fishing industries, and navigate export regulations. It analyzes both marine and inland fisheries, assessing their roles in the economy, while offering a roadmap for policy and operational reforms that would help Pakistan meet the international market standards and unlock the export potential of its fisheries.

Sector Overview: Pakistan is home to a variety of aquatic resources, including a 290,000 sq. km Exclusive Economic Zone (EEZ) in the marine environment and 8.6 million hectares of inland waterways such as rivers, lakes, and dams. These areas hold considerable potential for the growth of both marine and inland aquaculture, yet the industry is underperforming in terms of production and contribution to GDP. Despite vast resources, the country produces only 800 metric tons of fish annually, ranking 28th in global fish production. The export of fisheries constitutes just a small fraction of total production, with only 22% of caught fish being exported. This reflects severe inefficiencies in the industry's value chain, regulatory frameworks, and lack of modernization.

Marine and Inland Fisheries: Pakistan's marine fisheries rely heavily on its coastal regions in Sindh and Baluchistan, including fishing ports in Karachi, Gwadar, and Pasni. These areas offer rich aquatic resources, including estuaries and continental shelves conducive to diverse marine species. However, overfishing and outdated fishing techniques have limited their full potential. Similarly, inland fisheries are spread across vast networks of rivers, lakes, and dams, with significant opportunities for expansion in aquaculture, particularly in warm-water species like carp and tilapia.

The development of aquaculture in Pakistan remains limited, mainly due to the reliance on traditional farming methods and a lack of technological advancements. Freshwater fish species such as carp, tilapia, and catfish are cultivated, but production is concentrated in small-scale, low-input systems. Furthermore, the potential for shrimp farming in saline and brackish areas in Punjab and Sindh remains largely untapped.

Current Export Challenges: Pakistan's fish exports face significant hurdles, particularly in meeting the stringent quality standards set by international markets, including the European Union (EU). The current regulatory framework has limited the number of export-approved Pakistani firms, signaling deep issues within the value chain that need to be addressed. These constraints, coupled with a lack of awareness and research, restrict the sector's ability to expand its export footprint. Despite these challenges, the sector holds the potential to generate significant revenue, with estimates suggesting a marketable export potential of up to $1 billion.

Strategic Recommendations: To overcome the existing limitations and realize the full potential of Pakistan's fisheries sector, several key recommendations and strategies need to be implemented:

1. **Improving Regulatory Frameworks and Governance:**
    - Streamline regulations through a comprehensive national fisheries policy.
    - Establish and enforce sustainable fishing practices, such as quota systems and seasonal closures.
    - Implement gear restrictions and marine protected areas to prevent overfishing and preserve vital ecosystems.
2. **Infrastructure Development and Technological Upgradation:**
    - Modernize the fishing fleet by introducing GPS tracking systems for efficient management.
    - Invest in infrastructure, including establishing fishing harbors and landing sites to enhance seafood product quality and marketability.
    - Develop inland aquaculture infrastructure, including hatcheries, to support the expansion of freshwater fish farming.
3. **Strengthening Institutional Capacity and Coordination:**
    - Enhance coordination among federal and provincial entities, such as the Fisheries Development Board (FDB), to ensure efficient resource management and policy implementation.
    - Foster public-private partnerships to attract investment and innovation in sustainable aquaculture practices.
    - Provide technical assistance to local fishermen and seafood processors to improve efficiency and market competitiveness.
4. **Research, Development, and Innovation:**
    - Invest in research and development to identify new aquaculture species, optimize existing farming techniques, and address environmental concerns such as water quality and disease management.
    - Promote collaborative research between universities, industry stakeholders, and government departments to facilitate technological advancements and value chain optimization.
5. **Market Access and Export Expansion:**
    - Facilitate access to international markets by meeting quality standards, improving food safety practices, and securing advantageous trade agreements.

- Support the participation of local seafood producers in international exhibitions to enhance market visibility and develop export networks.
- Address barriers to market access, including the complex regulatory requirements, and provide training to export firms on compliance with international standards.

6. **Investment in Aquaculture and Value Addition:**
   - Promote aquaculture practices that focus on value-added products such as fish fillets, smoked fish, and other processed seafood items.
   - Invest in value addition by establishing seafood processing plants and developing packaging and marketing strategies that appeal to global consumers.
   - Target emerging markets with high demand for seafood, such as China and the Middle East, through targeted export strategies and promotional campaigns.
7. **Supporting Small-Scale Fishermen and Women's Empowerment:**
   - Encourage the active involvement of women in the fisheries value chain, particularly in processing, marketing, and distribution.
   - Address gender-specific challenges faced by women in the sector by providing training, financial support, and opportunities for empowerment.
   - Implement programs to support small-scale fishermen by providing access to financial assistance, modern equipment, and training in sustainable fishing techniques.

The Role of Government and Key Stakeholders: Government departments such as the Ministry of National Food Security and Research (MNFSR) and the Fisheries Development Board (FDB) play a critical role in the development of the sector. The FDB's mission of enhancing national capacity for sustainable fisheries must be supported by clear policy reforms and strong institutional frameworks. Additionally, the collaboration of federal, provincial, and local authorities is essential to creating an integrated approach to fisheries management and ensuring sustainable practices that benefit both the economy and the environment.

Pakistan's fisheries sector, despite having immense natural resources and a long coastline, has yet to fully realize its potential in the global market. The sector holds great promise, yet it remains underdeveloped and constrained by outdated technologies, fragmented institutional structures, and limited focus on value-added production. Fish is one of the most traded commodities globally, and Pakistan's fisheries could play a pivotal role in bolstering the national economy through increased exports and improved management practices. The lack of EU-compliant facilities, the underutilization of modern technologies, and limited attention to sustainable practices hinder growth and export potential. However, with strategic investments and policy reform, the country can unlock the full capacity of its fisheries industry.

The key objective is to improve Pakistan's fisheries sector by addressing institutional fragmentation, enhancing aquaculture, and promoting value addition to fisheries products. To achieve this, a comprehensive approach has been proposed, which

includes empowering the Fisheries Development Board (FDB), promoting shrimp farming clusters, upgrading fish processing units to international standards, creating financial support mechanisms for small-scale farmers, and establishing a dedicated export promotion unit.

Key Findings and Recommendations

1. **Institutional Reform and Empowerment of FDB** The Fisheries Development Board (FDB) plays a central role in improving the sector, but its effectiveness is hindered by institutional fragmentation. To address this, it is recommended that the FDB be strengthened by reconstituting its membership to include representatives from key stakeholders, including the Pakistan Standards and Quality Control Authority (PSCQA), the Marine Fisheries Department (MFD), and the Ministry of Maritime Affairs (MOMA). This approach aims to streamline operations and facilitate better decision-making, with regular meetings and reviews to ensure accountability.
2. **Promotion of Shrimp Aquaculture** Pakistan has significant potential for shrimp farming, particularly in the saline waters of South Punjab. It is crucial to release PSDP funds for the Pilot Shrimp Farming Cluster Development Project. This project should focus on promoting shrimp farming as a sustainable aquaculture option in the region, with attention to training, technology adoption, and market access. By providing subsidies for shrimp feed and seed, the project can support small-scale farmers while increasing the sector's export capacity.
3. **Establishment of EU-Compliant Fish Processing Units** To meet international standards and enhance Pakistan's export potential, the establishment of three modern fish processing units is vital. These units, which should comply with the European Union's Minimum Residue Levels (MRPL) and Sanitary and Phytosanitary (SPS) standards, will ensure that Pakistan's fish products meet the stringent requirements of international markets. These processing units should be set up in key locations like Korangi and Gwadar, with a public-private partnership (PPP) model facilitating the required investments.
4. **Microfinance for Small-Scale Fish Farmers** Empowering small-scale fish farmers through access to finance is critical for the sector's growth. A soft loan package with a 5% fixed interest rate for five years should be made available through financial institutions such as the Zarai Taraqiati Bank Limited (ZTBL), Bank of Punjab (BOP), and the National Bank of Pakistan (NBP). A comprehensive database of fishermen should be established to ensure that the financial assistance reaches those in need. This initiative will help farmers modernize their practices and improve production capacity.
5. **Dedicated Export Promotion Unit** A dedicated export promotion unit should be established within the FDB to facilitate streamlined export processes for fisheries products. This unit would liaise with federal agencies and trade bodies, offering a one-window operation to address export-related challenges. The unit's goal is to gather data for needs assessment, streamline the export process, and promote Pakistan's fisheries sector in international markets.

Action Plan and Implementation Timeline

The recommendations presented above require coordinated actions from various stakeholders, including the government, financial institutions, and industry players. Key performance indicators (KPIs) for each project have been established to monitor progress and ensure accountability. For example, the strengthening of FDB and the establishment of shrimp farming clusters should be initiated within six months, while the establishment of fish processing units should take approximately three years to complete.

To facilitate these efforts, a strong institutional framework is necessary. The government must commit to providing the necessary resources, such as financial support for the development of infrastructure and training programs, and ensure that policies are aligned with the goals of fostering a sustainable, export-driven fisheries sector. With a clear roadmap for institutional reform, infrastructure development, and financial empowerment, Pakistan's fisheries sector can realize its potential and become a significant contributor to the national economy.

Conclusion

Pakistan's fisheries sector has immense potential but requires substantial reforms, investment in infrastructure, and improved regulatory frameworks to thrive. By addressing the gaps in governance, promoting sustainable practices, empowering small-scale farmers, and enhancing the sector's export capabilities, Pakistan can position itself as a competitive player in the global seafood market. With the right mix of government support, private sector involvement, and international cooperation, the fisheries sector can become a key driver of economic growth, food security, and poverty alleviation in Pakistan.

Introduction

Over the past 30 years, the aquaculture sector has grown at an astounding pace of over 10% worldwide (Jolly et al., 2023). Because of its high-quality protein content, low fat level, and abundance of omega-3 fatty acids, vitamins B2 and D, and other important minerals, fish is a widely consumed food source worldwide. Pakistan's fishing sector is expanding, but it hasn't reached its full potential yet. Fisheries are essential for supplying food, providing coastal populations with a means of subsistence, generating revenue from exports, and strengthening the national economy. Apart from the maritime sector, inland fisheries, situated in rivers, lakes, ponds, and dams, are also essential to the nation's economy. Despite having a negligible contribution to GDP right now, Pakistan's fishing industry has great potential to increase the country's gross domestic product through export revenue.

The following are the objectives of this study:

- To undertake a situational analysis of the fisheries sector, delineating marine and inland capture, the extent of aquaculture development, existing export earnings, and its export potential.
- To study the relevant organizational structures of the Fisheries Development Board, its role in detail, as dealing with the issue and suggesting improvements.
- To highlight the role of the Marine Fisheries Department in promoting and sustaining the fisheries sector, the department's capacity, its functions, and proposals for quality control and reforms.
- To emphasize the importance of research and propose solutions for the issues faced by the sector.
- To formulate a realistic operational plan to meet the objective, considering the existing resources, with a special focus on implementation and sustainability.

Problem Statement

The seafood industry is an emerging sector worldwide due to its high nutritional value and increasing demand. With a long coastline and good reservoirs of inland waters, Pakistan has immense potential, yet it has a very little focus on the fisheries sector. In the export sector, EU authorities have allowed only two exporters from Pakistan to export fish, pointing towards value chain constraints. Is it due to the regulatory framework, lack of awareness, limited research, or the use of traditional technology that the resources are underutilized? This study intends to propose strategies that can enhance Pakistan's aquaculture productivity, augment the value-added fishing industry, and help Pakistan's fisheries industry to effectively navigate stringent export regulations to broaden its market access.

Scope and Significance of the Study

This study will be covering Pakistan’s fisheries sector encompassing both federal & provincial entities working for its development. Institutional set up & role of all entities established for this purpose will be analysed. This study analyses the development of aquaculture with high quality fish meat for sustainable and value-added fishing and increase in export of fisheries.

Research Methodology

A mixed-method approach has been used in this study. Primary data was collected through interviews and face-to-face meetings. Secondary data was analyzed from available sources (government publications, academic studies, international publications, etc.).

The topic is analyzed through cause-effect analysis, SWOT analysis, and comparison with international best practices.

Literature Review

This study is the outcome of an in-depth investigation that involved reviewing reports, journal publications, and pertinent departmental data. The difficulties associated with overfishing and the requirement for better resource management are highlighted in recent research (Hussain et al., 2022). They emphasize how crucial it is to have strong laws to stop overfishing and preserve the long-term health of fish populations in Pakistani waters. In Pakistan's small-scale fishing sector, women are vital yet sometimes undervalued. Their active involvement in various phases of the fisheries value chain has been the subject of research (Shah et al., 2018). The research also emphasizes the difficulties that women encounter and opportunities regarding their empowerment in this field.

Pakistan's fish exporters face certain difficulties in foreign markets, like difficult-to-meet quality requirements and problems in getting access to markets. Studies evaluate Pakistan's fishery goods' export competitiveness (Ali, 2018).

The research looks at the tactics needed to improve Pakistan's competitiveness in the global seafood industry and to meet international quality standards. Enhancing the quality of fish and seafood products, resolving supply chain problems, and securing advantageous trade agreements are among some key recommendations. Sustainable development requires effective protection and management of fisheries (Mohsin et al., 2022).

Situational Analysis

Pakistan possesses abundant fishing resources with a 290,000 sq. km marine exclusive economic zone (EEZ), a 1,120-kilometer coastal strip with five fishing ports, and 8.6 million hectares of inland waterways. All will be discussed and analyzed here separately.

Marine Resources

Two components comprise Pakistan's marine fisheries industry: The Exclusive Economic Zone (EEZ), which stretches up to 200 nautical miles offshore, and the coastal fisheries resources found along the shorelines of Baluchistan and Sindh. The fishing area is projected to be 196,600 sq. km with 50,000 sq. km. being coastline regions with a depth of less than 200 meters. The continental shelf around the Makran coast is incredibly small, steep, and rocky. The Sindh coast offers good trawlable ground because of its extensive, usually flat 40–120 km shelf area (Nusrat, 2021). An excellent place for aquatic resources to nurture is the vast estuary delta of the Indus River. Jiwani, Gwadar, Pasni, Ormara, and Karachi are among the fishing harbors along the coast (Ministry of Maritime Affairs [MOMA], 2019).

Inland Resources

There are vast networks of lakes, rivers, and canals throughout Pakistan. A total of 109,780 hectares are covered with natural lakes (Bhatti et al., 2015). Some are high-altitude lakes that are good for cold-water fish, such as Hanna in Baluchistan, Sapara in Gilgit-Baltistan, and Saif-ul-Mulook in Khyber Pakhtunkhwa (KP). Most Sindh's warm-water lakes are found there; Manchar and Keenjhar are the two largest. The country's principal freshwater fishing grounds are the Indus River and its tributaries. About 4.57 million hectares are covered by these still and moving rivers, while roughly 2.225 million hectares are covered with waterlogging (Bhatti et al., 2015). Mangla, Tarbela, Chashma, Hab, Khanpur, and Warsak are reservoirs that span over an area of 80,613 hectares and are significant for freshwater fishing. In addition, there are over a hundred small dams in the country's Barani tract that are used to store water and have a huge potential for aquaculture expansion.

Production of Marine vs. Inland Fisheries

With respect to total fish production, Pakistan produces approximately 800 metric tons, which contributes less than 1% to the country's GDP. Unfortunately, Pakistan's fish production is ranked 28th in the world (FAO, 2020), despite the country having enormous potential and current fishing resources.

The Extent of Development of Aquaculture

Aquaculture in Pakistan is new and limited to carp farming, mainly in earthen ponds. Despite the country's abundant fresh, brackish, and marine water resources, only nine warm-water and two cold-water species are commercially cultivated, as mentioned below. Data has been taken from NARC (2015). Carps (including Labeo Rohita (Rahu), Cirrhinus Mrigala (Mori), Catla Catla (Thaila), Cyprinus Carpio (Gulfham), Hypophthalmichthys Molitrix (Silver Carp), Aristichthys Nobilis (Bighead Carp), Ctenopharyngodon Idella (Grass Carp)), Tilapia (Oreochromis Niloticus), and Catfish (including Ictalurus Punctatus, Clarias spp.) are the warm-water fish species, while Trout (including Oncorhynchus Mykiss (Rainbow Trout), Salmo Trutta Morpha Fario (Brown Trout)) is the cold-water species being used in aquaculture in Pakistan.

These fish are raised in large polyculture farming systems in clay ponds with little input; semi-intensive culture has also been used in various farms. Furthermore, there are enormous prospects for shrimp farming on 1.5 million acres of saline or brackish land in Punjab and Sindh that range in salinity from 100 to 300 TDS (Rehman, 2020).

Imports vs. Exports

Pakistan imports two types of farmed fish species from Vietnam: pangasius and tilapia. The total import duty is 61%, which includes 20% customs duty, 35% regulatory duty, and 6% extra customs duty. These fish have been farmed through experiments with varying degrees of success. The most exported category is frozen flat fish (HS-06), followed by shrimp and prawns. Out of all the capture, just 22% is exported to other countries (NARC, 2015).

Current Exports and Further Potential

It is estimated that the sector has the potential to generate around $1 billion in revenue from existing resources, and the aquaculture sector in the fisheries sector has the potential to generate more cash exports for the Pakistani fisheries sector (MFD, 2015).

CPEC and Fisheries

The Eastern Exclusive Economic Zone (EEZ) is unexplored for marine fishing due to overfishing and outdated fishing methods and techniques. Investments like CPEC provide a great chance to support loan applications for high seas fishing and value addition. The government can set aside job quotas and provide subsidies for marine aquaculture to address the concerns of local people.

Role of Government Departments in Fisheries

Fisheries Development Board (FDB)

FDB is a subsidiary of the Ministry of National Food Security and Research (MNFSR), Government of Pakistan, and is committed to promoting sustainable fisheries and aquaculture. It was established in 2007 under Section 42 of the Companies Act, 1984, with the aim of promoting the development of fisheries in the country. It is funded by the government through PSDP and donors.

The mission of FBD is "Enhancing national collective wisdom for action in the aquaculture and fisheries sector. To develop a sustainable and competitive fisheries sector in Pakistan that maximizes economic growth, ensures food security, and conserves marine resources for future generations."

The objectives of FDB include national and provincial coordination for the promotion of Investment and Joint Ventures, along with capacity building to enhance sustainability, increase economic growth, ensure food security, and conserve marine resources.

strategies

- Regulatory reform and governance for a comprehensive national fisheries policy to streamline regulations and enhance governance.
- Infrastructure development, including modernizing fishing vessels and establishing fishery harbors and landing sites to facilitate seafood products.
- Encouraging public-private partnerships to attract investment.
- Providing technical assistance to fishermen and seafood processors.
- Research and development initiatives to develop innovative solutions for sustainable aquaculture and value chain optimization.

Tactics:

- Implementing a quota system, seasonal closures, and gear restrictions to manage fish stocks and prevent overfishing.
- Establishing marine protected areas and conservation zones to preserve critical habitats.
- Upgrading fishing fleets with GPS tracking systems for efficient business.
- Providing financial incentives, grants, and subsidies to encourage investment and enhance market access through trade agreements and participation in international seafood exhibitions.
- Conducting public awareness campaigns to educate consumers about sustainable seafood choices.

Details of On-Going Projects

The details of ongoing projects of FDB are as under:

1. Cage culture Cluster Development Project. 5 Years (2019-24)

- Up scaling cage culture technology across Pakistan.
- Increase per capita fish consumption

Allocation (Millions of Rs.)	Releases (Millions of Rs)	Utilization (Millions of Rs)
Federal: 511.636	Federal: 256.348	Federal: 206.812
Punjab: 945.585	Punjab: 519.459	Punjab: 434.685
Total: 1457.221	Total: 712.574	Total: 641.497

2. Pilot Shrimp Farming Cluster Development Project. 5 Years (2019-24)

- Promotion of shrimp aquaculture in inland areas.
- Development of shrimp value chain, support services and legal framework.

Allocation (Millions of Rs.)	Releases (Millions of Rs)	Utilization (Millions of Rs)
Federal 903.52	Federal 530.31	Federal 272.22
Punjab 716.66	Punjab 528.73	Punjab 341.03
Total 1620.18	Total 1059.05	Total 609.81

3. Promotion of Trout Farming in Northern Areas of Pakistan. 5 Years (2019-24)

- Enhance capacity for quality trout seed production through infrastructure development.
- Support for establishment of trout farms in private sector.
- Training & Capacity Building of Public/ Private sector.

Allocation (Millions of Rs.)	Releases (Millions of Rs)	Utilization (Millions of Rs.)
KP 366	KP 307	KP 307
GB 300.76	GB 306.76	GB 306.76
AJK 268.94	AJK 230.68	AJK 230.68
Mark-PARK 25.00	Mark-PARK 24.99	Mark-PARK 24.99
PMU 86.11	PMU 79.35	PMU 79.08

Source: Fisheries Development Board (2023)

Marine Fisheries Department

MFD is a federal entity working under the Ministry of Maritime Affairs (MOMA), Government of Pakistan. MFD is a regulatory authority having a scope to protect, manage, and develop fisheries resources and fisheries products, and also manages marine resources ranging from 12 to 200 nautical miles. Pakistan's fish exports currently constitute only 0.25% of global exports (Nazir et al., 2015). MFD is facing a serious crisis of HR issues. According to the organizational charts, there are four board members, but currently, only the Board of Directors member is filled.

It is a regulatory body with roles and responsibilities such as preventing unhealthy fish exports, carrying out inspections, regulating deep-sea fishing, and raising per capita fish consumption through oversight activities.

The following are the different acts through which MFD draws its authority:

- Exclusive Fishing Zone (Regulation of Fishing) Act, 1975
- Exclusive Fishing Zone (Regulation of Fishing) Rules, 1990 and subsequent amendments
- Pakistan Fish Inspection and Quality Control Act, 1997
- Pakistan Fish Inspection and Quality Control Rules, 1998 and subsequent amendments.

MFD is working to promote fish exports and fishing equipment by adding additional services, starting new fisheries, training fishermen, and creating value-added items. It has taken innovative steps to develop the fishing industry. MFD registered 26 projects in 2017. In 2021, by June 2023, this number will exceed 400. Export value production is expected to reach 496 million in 2023 due to increased global demand. Pakistan's main buyers are China, Thailand, Malaysia, the Middle East, Sri Lanka, Japan, the European Union, etc.

Export of seafood to EU countries is given in table:

Table 2.21: Export of Seafood to EU Countries FY2023 (July-March)

Commodity/ Country	Fish		Squids		Shrimp		Crabs		Total	
	Quantity (MT)	Value US$ (000)	Quantity (MT)	Value US$ (000)	Quantity (MT)	Value US$ (000)	Quantity (MT)	Value US$ (000)	Quantity (MT)	Value US$ (000)
Belgium	410	1,036	-	-	1,235	5,440	-	-	1,645	6,476
Netherlands	99	369	-	-	56	236	-	-	155	605
Spain	-	-	112	296	-	-	-	-	112	296
UK	736	2,632	-	-	269	519	8	46	1,013	3,197
Total	**1,245**	**4,037**	**112**	**296**	**1,560**	**6,195**	**8**	**46**	**2,925**	**10,574**

Source: Marine Fisheries Department

TED and Trials: TED is an abbreviation for Turtle Exclusion Device. As the US has imposed a ban since 2017, one of the conditions is to introduce TED devices and conduct trials. A dossier of 1,000 pages has been sent through the Sindh government, with the main aim of reducing turtle deaths in fishing nets (shrimp trawl nets) and protecting the livelihoods of local fishermen. MFD is conducting a pilot TED (Turtle Exclusion Device) training program for fishermen.

Modernizing the Fishing Fleet: MFD has achieved a success story by offering boat designs, and now fishermen are refitting their boats with fiberglass cladding to bring them into line with EU standards.

Deep Sea Fishing: The "Deep Sea Policy" was revised in April 2018. Since 2009, no offshore/foreign fishing boats have been operating in the EEZ. The Ministry of Labor amended the Special Fisheries (Fisheries) Act, 1990, by regulating deep-sea fishing to ensure the sustainability of pristine fisheries in Pakistan's Exclusive Economic Zone (EEZ), but it still needs to be strictly implemented.

Capacity Building and Training of Fishermen and Other Stakeholders: MFD is conducting numerous training programs for fishermen and other stakeholders related to the industry:

- On-board handling and preservation of fish catches
- HACCP training for the seafood industry; HACCP systems of 28 establishments have been approved
- Design/construction and fixing of TEDs in shrimp trawl nets
- Special training for PMSA and Coast Guard

Capacity Issues of the Organization: Currently, MFD is facing an HR crisis and relies solely on natural resources, which adversely affects exports. There are some proposed changes to Pakistan's fish inspection, and if approved, fish farming will also be incorporated into MFD for the purpose of increasing exports.

Post-18th Amendment Situation Analysis

After the dawn of the 18th Amendment to the Constitution of Pakistan, the responsibility for protecting natural resources was transferred to the provinces, directly resulting in a decrease in exports. The lack of timely policy and coordination between the provinces and the federal government led to a decline in the fishing industry, affecting the market and farmers in the coastal areas. Although Pakistan has the potential to export quality fish, only one company will have the right to export to the EU in 2020-21 due to the divergence in export prices.

Proposal for Quality Control and Reforms

The Ministry of Marine Fisheries received a grant of PKR 231.626 million for the PSDP program "Improvement of Management Systems and Improvement of MFD Service Evaluation" in 2022-23 to monitor the quality of fish and fishing equipment and prevent the export of substandard products by promoting exports and providing guidance on the implementation of food safety management procedures based on Hazard Analysis Critical Control Points (HACCP). It is necessary to open new windows for seafood exports. There is a huge demand for tuna, mackerel, and sardines, and introducing buyback agreements for canning line production could be a solution. The government needs to revisit the entry fee to encourage exporters to invest, following the example of foreign countries that sell the final product at a retail price 30 times the value of the product.

Analysis and Recommendations

International Best Practices: China and Vietnam

China and Vietnam were chosen for this study and comparative analysis due to their significant position in fish management and the blue economy. China stands at approximately 30% of world fish production, and Vietnam's marine fish production is comparable to Pakistan's, but its exports are better than Pakistan's, with a share of 4% in global fish production.

China's fisheries sector is remarkable; marine fish constitutes 15% of world fish production, and freshwater fish constitutes 13% in the global blue economy.

Production trends of Pakistan, Vietnam and China are as:

- **Pakistan:** Fish production in Pakistan's inland waters remained stable, increasing from 70,000 tonnes in 1980 to 150,000 tonnes in 2020.
- **Vietnam:** Vietnam's marine fisheries also appear to be stable, remaining at 150,000 tonnes from 2017 to 2020, following some changes in previous years.
- **China:** Although China's production increased, it decreased from 2.18 million tons in 2017 to 1.46 million tons in 2020.

Comparative Analysis

Practices for Fish Production	China	Vietnam	Pakistan
Forms of Aquaculture	• Pond Culture • Net Cage Culture • Rice Fish Culture • Pen Culture • Industrial Aquaculture	• Polyculture System • Monoculture System • Pangasiids Culture • Brackish Water • Biofloc technology • Production of high value species	Pond Culture Cage Culture Biofloc technology
Forms of Seawater Aquaculture	• Pond Mariculture • Net Cage Culture • Raft Culture • Sea Bottom Ranching • Hoisting Cage Culture • Land-based (indoor tank) industrial mariculture	• Spiny lobster farming • Marine Aquaculture • Seaweed Culture • Seafood Export • Shrimp forming	Nil
Development of New Species	• 229 new aquatic products were approved in China from 1996 to 2019	• Open Door Policy since 1980	

The system is an environmentally friendly, low-cost shrimp farming technology that meets organic production standards. Large-scale agricultural development now covers 330,000 hectares (Tri et al., 2022). The system is an environmentally friendly, low-cost shrimp farming technology that meets organic production standards. In China, there is a huge investment in research and technology, and according to the "China Fisheries Statistical Yearbook," the budget allocated to fisheries research and technology increased from 1.058 billion yuan in 2009 to 3.046 billion yuan in 2019. However, this amount accounted for only 0.26% of GDP in 2019 (Hu et al., 2021).

The comparison suggests that Pakistan can learn from Vietnam's success model and invest in research, education, and technology, encourage private investment, and increase productivity. Vietnam has a plan to develop a professional seafood farming system. This automated large-scale cage system will be installed in the deep sea and powered by clean, renewable energy. It will continue to work and become useful. The system, which has production estimates of about 8,000 tons per year, is expected to revolutionize the aquaculture industry. This is a new concept that aims to redefine the future of fish farming.

Causes and Effect Analysis

This passage highlights the challenges faced by Pakistan's fisheries industry and suggests potential solutions based on international best practices.

Challenges

1. **Energy-intensive methods:** Reliance on these methods leads to high fuel costs, reduced profitability, and environmental damage.
2. **Post-harvesting issues:** Lack of proper storage facilities and ineffective transportation practices cause spoilage and reduce the quality and quantity of fish available for sale.
3. **Overfishing:** Depletion of fish stocks due to overfishing threatens the long-term sustainability of the industry, harms ecosystems, and limits catches.
4. **Lack of local infrastructure:** Inadequate processing facilities and limited cold storage units reduce the value of catches and increase post-harvest losses.
5. **Low value addition:** Lack of investment in processing technologies and product diversification limits the ability to compete in the market and capture new opportunities.
6. **Quality control issues:** Variations in product quality and a lack of standardized practices create consumer distrust and restrict export potential.
7. **Lack of harbor cities:** Limited access to export markets increases shipping costs and transit times, reducing competitiveness.
8. **Fragmented administration:** Conflicting regulations, inefficient communication, and a lack of coordination among government agencies hinder development and investment.

Solutions

- **Invest in research and technology:** Learn from Vietnam's success in adopting environmentally friendly, low-cost shrimp farming methods. Increase investment in research similar to China to develop sustainable fishing practices and improve productivity.
- **Upgrade infrastructure:** Develop harbor cities to improve access to export markets and reduce transportation costs. Build proper storage facilities and invest in refrigerated trucks to maintain the quality of catches.
- **Promote sustainable fishing practices:** Implement regulations and quotas to prevent overfishing and protect fish stocks. Consider adopting TEDs (Turtle Exclusion Devices) as seen in the US to minimize bycatch.
- **Invest in processing technologies:** Encourage private investment in modern processing facilities to produce value-added products like fillets and frozen seafood.
- **Improve quality control:** Implement standardized quality control procedures to ensure consistency and meet international export standards.
- **Strengthen governance:** Streamline regulations and policies to create a clear and efficient regulatory framework for the industry. Improve communication and coordination among government agencies to address challenges effectively.
- **Treating sewage and controlling population growth** to protect water quality and fish production.

- **Educating consumers** about sustainable seafood choices can further support the industry.

By addressing these challenges and adopting best practices, Pakistan can unlock the full potential of its fisheries industry, promoting sustainable growth, economic prosperity, and environmental well-being.

SWOT Analysis of Fisheries Sector of Pakistan

Strengths

1. **Rich in Fishery Resources:** Pakistan's extensive coastline and wealth of marine resources provide a solid foundation for the fishing industry.
2. **Cheap Labor:** The availability of reasonably priced labor increases the competitiveness of Pakistani seafood products and reduces manufacturing costs.
3. **Abundant Saline and Waterlogged Land:** Pakistan's marshy and salty terrain can be utilized for aquaculture, increasing output and diversifying production.

Weaknesses

1. **Fragmented Regulatory Framework:** A fragmented regulatory environment creates inefficiencies and inconsistencies in governance and management.
2. **Lack of National Fisheries Policy:** The absence of a cohesive national fisheries strategy hinders sector development and strategic planning.
3. **Underdeveloped Value Chain:** Weak connections between fishermen, processors, and exporters limit value addition and market competitiveness.
4. **Outdated Techniques and Unskilled Labor:** The persistent use of traditional fishing methods and the presence of untrained labor hampers productivity and quality.

Opportunities

1. **International Growing Demand:** Rising global demand for seafood presents opportunities for Pakistan to increase exports and capture new market segments.
2. **China-Pakistan Economic Corridor (CPEC):** Infrastructure developments under CPEC can boost logistics and connectivity, promoting trade and investment in the fishing industry.
3. **Shrimp Farming:** Shrimp farming offers a viable avenue for aquaculture output diversification and targeting premium markets.
4. **Deep Sea Potential Exclusive Economic Zone (EEZ):** Pakistan's EEZ holds significant potential for offshore fishing and the discovery of unexplored marine resources.

Threats

1. **Multiple Fish Harbours:** Multiple fish harbors can lead to inefficiencies in infrastructure construction and resource allocation, hindering coordination and planning.
2. **Illegal, Unreported, and Unregulated (IUU) Fishing:** IUU fishing threatens the sustainability of fish stocks and hinders efforts to manage and conserve marine resources.
3. **Lack of Continuity of Policies:** Inconsistent policy implementation and a lack of

continuity hinder long-term planning and investment in the fishing industry.

4. **Endangered Habitats:** Environmental degradation and habitat loss pose risks to marine biodiversity and ecosystem health, impacting the long-term viability of the fishing industry.

Conclusion

Fish is the most traded commodity in the world, but compared to its neighbors in the region, Pakistan has yet to fully exploit its market potential. Countries with similar agricultural production, such as Vietnam, have proven that supporting small farmers with training and modern equipment can generate export earnings. The establishment of an EU-compliant fishing port outside Karachi is essential to reduce overfishing, control illegal, unreported, and unregulated fishing, and promote exports while bringing economic prosperity to small-scale fishers. Achieving this goal requires improving the country's agricultural policies and implementing better management systems. The government needs to move in the right direction through the right policies to reduce the difficulty of doing business in the country.

Recommendations & Action Plan

For any plan to work properly, many issues related to fisheries need to be addressed. A comprehensive work plan with key performance indicators (KPIs) is provided here.of the Livestock Department used for vaccination and outreach activities to discourage misuse.

Recommendations	Actions	Responsibility	Timeline	Resources Needed	KPIs
An Empowered FDB					
1.To remove institutional fragmentation	To strengthen FDB by reconstituting its membership, inclusion of member from PSCQA, MFD, rep of MOMA, GB & AJK, PARC, Chairman BOI with inclusion of industry stakeholders and domain researchers/academicians with Secy MNFSR as chairman	PNFSR, Board Nomination Committee with the mandate to initiate process of nomination 06 months prior to dissolution of the Board	06 months i.e., April 2024	Within own sources	1.Mandatory bi-monthly meeting 2.50% quorum 3.Bi-annual review and stocktaking meeting 4. Board Nomination Committee with the mandate to initiate process of nomination 06 months prior to dissolution of the Board
PILOT SHRIMP FARMING CLUSTER PROJECT					

Recommendations	Actions	Responsibility	Timeline	Resources Needed	KPIs
2.To promote Shrimp aquaculture	Immediate release of PSDP funds of existing Pilot Shrimp Farming Cluster Development Project, Projects targeted at Brackish/Saline water in South Punjab region	Fisheries Department, Punjab/ P&D Board	01 year, 2024	Rs. 500.00 million of approved annual ADP allocation	1.Approval of the revised project from ECNEC 2.First Annual Review of Effects on Exports by 31st Dec 2024 3.Release of funds 4.Selection of farmers. 5.Provision of subsidy for shrimp feed and seed
PILOT PROJECTS TO MEET EU MRPL & SPS STANDARDS					
3.To promote value addition	03 Fish Processing Units of EU standards, International Standard Cold Storage and Shipping Unit in Korangi and Gwadar through CPEC and on PPP model	MFD, Livestock and Fishery Department Sindh, KoFHA,	03 years	State land, Contract through PPRA on Profit-sharing business	1. Selection of firm for feasibility Studies 2. Notification Pannel of Experts 3.Finalization of Feasibility Reports 4.Selection of Interested Applicants for establishment of Processing Plant and Cold Storage
MICROFINANCE TO EMPOWER SMALL-SCALE FARMER					
4.To empower small scale fish farmer	Creation of Database of Fishermen and Registration, Soft Loan Packages through ZTBL, BOP, NBP and Ministry of Finance at 5% interest at fixed rate for 5 years	MNFSR, Ministry of Finance, FDB, Provincial departments	To be launched in the new budget 2024-25	PKR 8 billion (Based on Fiscal Space)	1.Database collection by FDB 2.Phase-wise implementation in 5 phases 3.Strict loan approval criteria 4.Bi-annual review by MNFSR and MoF
DEDICATED EXPORT PROMOTION UNIT					
5.Window for export	Liaison with federal agencies and trade bodies under one window operations	FDB, MFD	6 Months	Within own sources	1.Data collection in 2 months for need assessment

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