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Original Research Article

FISH INDUSTRY: A DISCOURSE ANALYSIS OF THE FUTURE PERSPECTIVE OF PAKISTAN

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Abstract: *The research article outlines Pakistan's fisheries industry output from 1950 to the recent past and fishery product trading from 1980 to 2011. Based on economic research, the findings show that fish output and export continuously rose year after year. Despite this, the pace of development in fish output over the previous two decades has been quite modest compared to other emerging nations. The research also shows that inland aquaculture output in Pakistan is quickly outpacing marine aquaculture. On the contrary, no marine aquaculture methods exist or are supported to improve fish output. The article discusses and measures fisheries sector security and future development potential for coastal and non-coastal regions. In Pakistan, aquaculture has emerged as the most promising option to address fish demand, food security, livelihood, employment, and national GDP. Furthermore, it is critical to focus on marine aquaculture to restore marine fishing resources, which may generate livelihoods in coastal communities. Finally, the main idea of this article is to provide developmental techniques for authorities to grow and expand the aquaculture industry, which might provide numerous options for livelihood support in Pakistan. The research uses methodological triangulation to evaluate the on-ground reality from a broader perspective. Moreover, an online survey will be presented to evaluate the output of the fish industry of Pakistan.*

Keywords: Pakistan, aquaculture, productivity, export, economic research, strategies

Introduction

1. Introduction

Fisheries are essential to the national economy. It directly employs around 300,000 fishermen. Moreover, an additional 400,000 individuals work in adjacent sectors. It is also a significant source of export earnings. Pakistan exported fish and fisheries products for US$117 million from July to May 2002-03. The Federal Government is in charge of fishing in Pakistan's Exclusive Economic Zone. It is also incharge of policy development, inter-provincial coordination, planning, research, quality control, training, exploratory fishing, stock assessment, fisheries management, fleet improvement, data collecting and export, and so on. Pakistan has a lot of fishing potential. It is in the northern portion of the Arabian Sea, with a 1,120 km coastline, a vast continental shelf, and an Exclusive Economic Zone that extends up to 200 nautical miles from the shore (FAO, 2014). There are around 16,000 fishing boats in Pakistan's coastal region that operate in both shallow coastal waters and offshore places predicting the market. The total output from inland and marine waterways is around 0.60 million tonnes.

Fisheries outputs from catch and aquaculture are substantial food, livelihood, employment, and economic resources (Godfray et al., 2010). Fish is a nutrient-rich and full-of-protein diet. It helps in treating nutritional inadequacies by providing calcium, vitamin A, iron, and zinc. In 2012, total fish output was 185 million tonnes, of which 91 million tonnes came from capture (11.6 and 79.7 million tonnes from inland and marine catches) and aquaculture. Aquaculture continuously increases worldwide fisheries output. Aquaculture contributed 90.4 million tonnes and $144.4 billion in 2012 (Fisheries, 2022). Around 58.27 million persons rely on catch fisheries, while 18.86 million cultivate fish/shellfish. Nearly 7.2 billion of the world's population eats 136.2 million tonnes of fish food, with 19.2 kg/capita/year; the remaining 21.7 million tonnes of fish are used for fish feed and livestock. China's seafood industry is the world's biggest and 35% of seafood originates from China. Whereas China ranks first in seafood exports with 4.16 million metric tonnes (MMT). China has 13 million anglers. The fisheries business is developing globally via possibilities for self-employment. Asia has 21 million fishermen and 18.9 million aqua culturists. Pakistan's contribution to fisheries is changing compared to other Asian countries. Pakistan has a 1,120 km coastline and 3,102,408 acres of inland water (Nutririon and Health, 2022; WFO, 2015).

Pakistan's fisheries sector needs reform. Overfishing has strained marine fisheries. Pakistan's fisheries sector lacks effective planning and management, which is necessary for aquaculture growth.

Aquaculture offers huge potential for Pakistan's fisheries industry, and it's growing. The government may spend more on the fishing industry. Aquaculture still needs improvement. Many studies have already described Pakistan's fisheries. Available material focuses on biology, biodiversity, toxicity, etc., but not the economic impact of this industry in Pakistan. This article aims to bridge gaps and offer solutions for improving, promoting, and extending Pakistan's fisheries industry (Fisheries, 2022).

2. Materials and methods

The research aligns with methodological triangulation (Bekhet and Zauszniewski, 2022). The articles aim to be mostly analytical, to identify Pakistan's fisheries industry output in Pakistan as well as factors associated with the industry in Pakistan. Based on the scrutiny of the acquired data, the findings will help in a better understanding of the ground realities of the fishing industry and the way forward. The article uses qualitative and quantitative research methods to paint a picture on a broader canvas (Haris, 2004). This paper used data from papers, project reports, scientific reviews, and brief communications. The article used 1950-2017 fisheries, aquaculture, and catch fisheries production data. Food and Agriculture Organization (FAO) worldwide fisheries reports were used to gather export and import statistics for Pakistan. Total fisheries, aquaculture, and capture production statistics for Pakistan, especially (1950 to 2017), were separated into key sections based on time and production amount. Moreover, an online survey was also conducted to evaluate the local public response either of consumers, fish farmers or of their exporters and the obtained results were analyzed by using one-way ANOVA (Potts et al., 2022). Following proforma was used for online survey of Pakistan (Table 1).

Table 1: Proforma for Discourse Analysis of fish industry of Pakistan

- **General public response:**

1. Fish consumption frequency
   a. Weekly b. monthly
   c. after months gap
   d. never
2. Preferred species, you purchase
   a. Fresh water and rivers fish
   b. Marine fish c. other marine species like prawns, crabs,lobsters etc. d. none of these
3. Is it economical to eat fish and other seafood?

- **Local fish farming response:**

1. Is fish farming is profitable?
2. Do you have basic facilities for fish farming?
3. Do you have basic fish farming handling and its related fish disease managementinformation? Yes/No
4. Is your fish farm registered? Yes/No

- **Fish export response**

1. Are you receiving a good response for the international response?
2. Internationally, which freshwater fish or seafood species are in more demand? Tell name(s), please.

3. Results

3.1 statistical View of Discourse Analyses

The obtained results are as follows:

3.1.1 General Public Response

The statistical analysis of fish consumption frequency in provinces of Pakistan (Table 2) and in this regard highly significant response of consumers was observed. In addition, the general public's purchase response was also estimated, and 28.75% of people preferred fresh water and river fishes because they are more economical than seafood, which is quite expensive yet for the masses (Table 3). But overall, consumers showed that fish is comparatively lower cost than red meat and affordable for middle and lower-class families (Figure 1).

3.1.2 Local Fish Farmers

The survey of local fish farmers showed that it is 100% profitable. But when they were inquired about having concerned facilities, 47.4% responded that they have basic fish farming facilities, and 52.6% claimed that that lack these basic facilities for establishing and maintaining the fish farm. In addition, when their level of fish farming awareness, management and handling skills were observed, 55.3% of them were trained in basic fish farm handling and related fish disease management information. In comparison, 44.7% of fish farmers still lack such essential awareness.

Moreover, when it was inquired whether their fish farms are registered or not, only 29.7% were found registered whereas 70.3% are not registered yet, which should also be focused by concerned authorities to maintain and provide standards of fish-based produce.

3.1.3 Export Response

In the current survey, the fish export response was not very satisfactory, as shown in figure 2. Whereas the response of international consumers to fish and seafood products in Pakistan was also studied, and their preference has been mentioned in figure 3.

3.2 Overall Fishing Output in Pakistan

Yes/No

Yes/No

Yes/No

Pakistan's overall fisheries production during 1950-2017 was 2,43,37,449 MT, with an average rate of 3,57,903 MT year-1 (per year), 2,19,81,192 MT from catch and 23,56,257 MT from aquaculture.1999 had the largest fish production, 6,77,606 MT. In 1950-1963, the total fisheries output was 8,99,319 MT, with an average production rate of 64,237 MT

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year-1. Initially, the production step-up in 1964-1975 was 20, 47,122 MT, with an average of 17, 05,935 MT year^{-1}, and the growth rate averaged 187 MT year-1. In 1984-2003, fisheries production increased from 1,06,18,323 MT to 5,30,916 MT annually. Comparing the first ten years, 1950-1959, production was 5,73,994 MT. In the previous decade (2008-2017), total output was 61,72,756 MT, with an average rate of 6,17,275 MT year-1, 86,359 MT year-1 greater than in 1984-2003. As a result, the overall fisheries production growth rate from 1950-2017 was 5.95 per cent year^{-1}, with the greatest and lowest rates in 1953 and 1974, respectively. In 1953, output grew by 3,590 MT, while it fell by 46361 MT in 1974.

3.3 Productivity in Capture Fishery

Most of the Pakistan's fish production comes from capture fisheries. From 1950 to 2017, capture fisheries contributed more than aquaculture. The 1950 capture of fishery yielded very few fish. After 1950, a terrible production of 24,451 MT was reported in 1951. In comparison, throughout 1950-1959, the total fish collected was 5,65,994 MT, and the year-1 estimate was 56,599 MT (Nazira et al., 2015). In 1997 fish catch was 5,89,795 MT, 23,801 more than the first decade. 1999. Pakistan's greatest capture output with 6,54,530 MT. Production rose and fell twice during 1990-2000. 1950-2017 average year-1 production was 3,20504 MT shows the capture production proportion of overall fisheries production. From 1950-1999, catch fisheries produced 98% of total fish (Saghir et al., 2019). From 2000-2017, capture fishing contributed 80% annually. In 1950, catch fisheries contributed 98% to overall production; in 2017, they contributed 76%. Due to the fast rise of aquaculture, capture fisheries' contribution proportion has declined (Suplicy et al., 2015).

3.4 Creating Food from Water

Aquaculture is not a recent phenomenon in Pakistan. Aquaculture's early contribution to the economy was negligible. In 2017, aquaculture accounted for 1,53,230 metric tonnes (MT), roughly 23.5 percent of the world's total fish harvest. Total aquaculture output fell precipitously to 1,44,208 metric tonnes (MT) over 41 years (1950-1990). Since 1991, aquaculture has been on the upswing in fish output, with an annual average estimate of 3,517 metric tonnes (MT), or around 0.64 percent year^{-1}; Growth rates of 4,483, 8,430, and 2,050 MT year^{-1} were calculated for the decades of 1991-2000, 2001-2010, and 2011-2017, respectively, and a substantial 5,460 MT year^{-1} increase was seen from 1991-2017.

3.5 Fishery Product Manufacturing for Export

Pakistan relies heavily on its fish exports for revenue. The year 1982 saw the lowest export of fisheries output at 4,709 MT, earning 7,619 (000) USD, while 2006 saw the greatest at 1,13,235 MT, earning 1,45,843 (000) USD. Control water flows; in 2012, it increased its production to 54,000 MW (Mohsin et al., 2022). It is also the main source of power for China. Pakistan's main clean energy source is hydropower, especially between the Arabian Sea and the mountains. Pakistan has a lot of potential to make use of hydropower. These features make sure that the falling water has enough potential energy to create the most pressure. There are also big rivers that flow into the Indus that can be used to make electricity. Pakistan could get more than 42,000 MW of power from hydropower, but only 16 percent of that has been developed. From 1980 to 1995, we may extrapolate an annual average export of 25,874 MT of fish and related products. At the same time, the anticipated annual average of fish exports was 80,435 MT from 1996-2011.

Meanwhile, between 1980 and 2013, it was estimated that fish product exports would average 53,154 metric tonnes (MT) and 78,771,000 U.S. dollars (USD) per year. When comparing the years 2009 and 1982, the maximum recorded export of fisheries production was 19.07%, while the lowest was just 1.39. From 1980–1995 and 1996–2011, we found that fish exports increased by 3.64 and 13.70 percent per year, respectively. Furthermore, between 1980 and 2013, the predicted yearly average export growth was 9.99 percent.

Table 2: Fish consumption frequency in Pakistan

Province	Mean of %age ± SEM
Punjab	26.75 ± 3.00*
Sindh	16.25 ± 2.56
KPK	13 ± 1.7
Baluchistan	4.75 ± 1.12

*All results are mentioned in Mean ± SEM while one way ANOVA results were found significant at 0.1% level (*).

Table 3: Fish and seafood species purchase trend in Pakistan

Species	Mean of %age ± SEM
Fresh Water Fish	28.75 ± 5.51 *
Marine Fish	2.65 ± 1.33
Prawns, Crabs and Lobsters etc.	2.63 ± 1.32
Never Purchase	1.00 ± 0.5

*All results are mentioned in Mean ± SEM while one way ANOVA results were found significant at 0.1% level (*).

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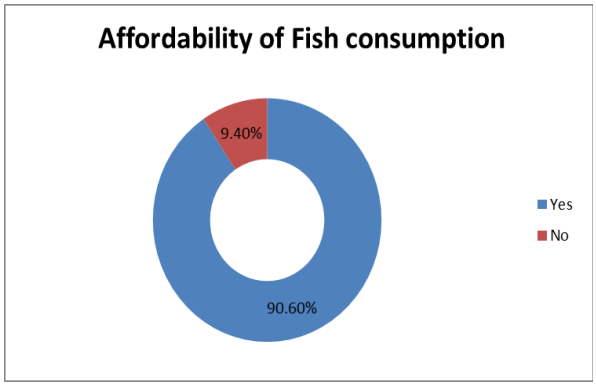

Figure 1: Public fish and seafood consumption response according to affordability

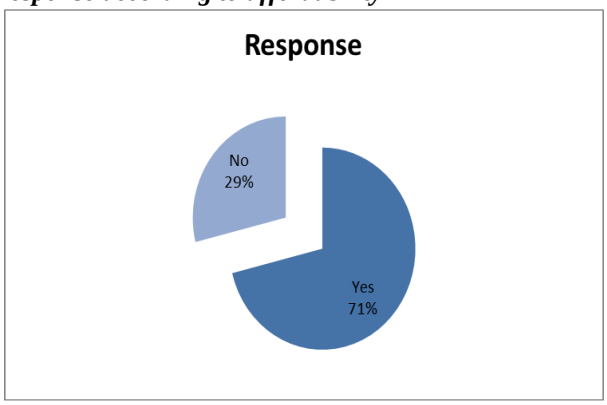

Figure 2: Fish export feed back

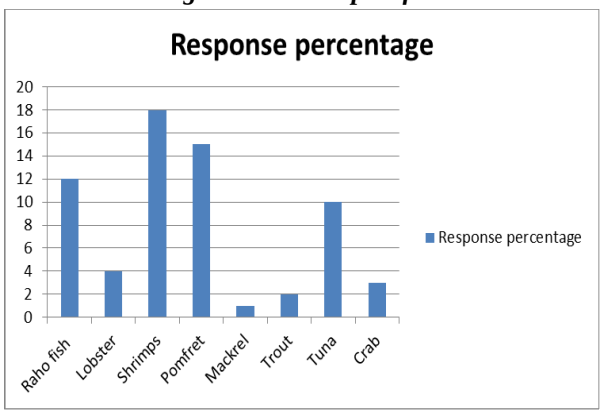

Figure 3: Export response for fish consumption priority according to their species

4. Discussion

First of all, the obtained statistical and survey results showed that the general public of Pakistan not only want to consume vast variety of aquatic fish and other related species but also have sufficient awareness that their businesses may serve as a profitable earning source even for a layman. Fish intake is also beneficial due to its high nutritional value for consumers. As a direct result of these positive effects on human health, the demand for fish is skyrocketing worldwide. It is obvious that catch fisheries cannot meet the global demand for fish on their own and that aquaculture plays a crucial role in feeding the world, especially in poorer nations. Fish production has reportedly grown as a result of initiatives in aquaculture. The aquaculture industry, in contrast to catch fisheries, is expanding rapidly at a rate of roughly 6.5% per year. Aquaculture's phenomenal expansion is particularly intriguing when contrasted with the expansion of other food industries. About 500 million people rely on the fishery industry for their livelihood, most of who live in developing nations Saghir et al., 2019). Because of its market-driven expansion and positive impact on rural economies, aquaculture has emerged as the sector's economic backbone. Women, in particular, can benefit economically from expanding aquaculture and related processing sectors. The fisheries (fishery and Aquaculture) industry accounts for almost 10% of the GDP in several major fish-producing countries. The annual value of the global fish trade is estimated at $100 billion, with poorer countries importing cheaper fish while exporting more expensive species to richer nations Godfray et al., 2010). Aquaculture increases fish output. In 2012, China produced 16,167,443 T and 41,108,304 T via capture and aquaculture, respectively. Aquaculture produced 24,940,861T more than capture. Vietnam 463,300 T, Indonesia 445,460 T and Bangladesh 190,291 T produced more aquaculture than capture fishery (Mohsin et al., 222). Other top fish-producing emerging countries, including India, Norway, Thailand, Chile, Myanmar, Philippines, etc., are growing their aquaculture sectors. Pakistan's aquaculture is growing. However, the rate is modest compared to other leading countries. As a result, Pakistan's fisheries sector falls behind other fish-producing countries' aquaculture fish output.

In Pakistan, commercial marine fish species were overfished owing to capture fishing. As a result, on the other hand, Pakistan has significant, semi-intensive, and intense inland aquaculture. In Pakistan, some commercially important Asian carp fish species are cultivated, including *Labeo rohita*, *Cirrhinus cirrhosus*, *Catla catla*, *Hypophthalmichthys molitrix*, *Cyprinus carpio*, *Ctenopharyngodon idella*, and *Hypophthalmichthys Nobilis*. On a smaller scale, Tilapia, some Catfishes, snakeheads, and other ornamental fishes. Government and non-government groups are making different efforts to launch intensive aquaculture with cage, pen, and cemented nurseries to show and teach local fish farmers to promote and develop inland and coastal aquaculture at the grassroots level. The maritime environment may not suit many aquatic species, although cobia, sea bass, milkfish, finfish, pearl spot, and grey mullets may be grown in Pakistani water bodies. Along with the fish mentioned above species, commercially valuable crustaceans, molluscs, and seaweeds can be produced to expand aquaculture.

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Conclusion

In conclusion, this study found that the aquaculture sector in Pakistan has grown by an average of 7,230 MT every year since 1999. The growth rate of aquaculture in Pakistan is expanding, but compared to other leading nations in aquaculture, this output growth rate is quite low, and it can be observed from currently conducted survey too. So, to boost fish yield in Pakistan, institutions must be strengthened, and certain quick actions are required to fulfill the demand for fish. Thus, aquaculture may be employed as an economic booster; by promoting marine culture and marine aquaculture, the industry can secure fish production and improve livelihood, food security, and employment opportunities.

Conflcit of interest

The authros declared absence of conflict of interest.

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