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ABSTRACT

Purpose: *The purpose of this research study is to examine the role of the fishing industry in India's economic development, with a particular emphasis on the coastal region of Karnataka. The fishing industry is an important part of India's economy, providing both jobs and foreign exchange gains. Coastal Karnataka, noted for its diversified fisheries resources and fishing communities, is an excellent example of understanding the sector's dynamics, challenges, and possibilities for long-term growth. This study will take a multidisciplinary approach, combining economic, environmental, and social perspectives to examine the influence of the fishing industry on regional development.*
Design/Methodology/Approach: *The research methodology employed in this study is primarily based on the utilization of secondary data collected by CMFRI reports, MPEDA reports, case studies, articles in the fishing industry, and other government websites have been used.*
Findings: *The coastal population depends heavily on the fishing business for a steady source of income. As this industry grows, it helps to reduce poverty and raise the standard of living in these neighbourhoods leading to economic development of the nation. Additionally, the industry has made significant strides in international markets, boosting India's reputation for high-quality seafood goods. With notable improvements in fish landings and economic value, the fishing industry is growing commercially.*
Originality/value: *This study may be useful to the various stakeholders in like fishing industry/sectors, government, Fishing boat owners, fishing community, other users, society*
Paper type: *Case study*
Keywords: Fishing Industry, Economic development, CMFRI, Coastal Karnataka, SWOC analysis

1. INTRODUCTION :

In terms of both overall fish production and aquaculture, India ranks second in the world. India's 8,129-kilometer-long coastline along the Arabian Sea, Bay of Bengal, and Indian Ocean offers a rich and varied marine habitat. India is one of the world's top players in the global fishing market because of its extensive marine territory and abundant fishing resources. Millions of people in India's coastal regions depend on fishing for a living, and it is deeply ingrained in the country's social structure. The industry not only contributes to economic well-being but also plays a significant role in meeting nutritional needs because of the high protein content and low cholesterol levels found in fish. For millions of people in India, fish is a key protein source. By offering a supply of healthy and reasonably priced food, the fishing industry contributes to increased food security (Kumar P. et al. (2015). [1]).
In 2022, 3.49 million tonnes of marine fish were forecast to be carried ashore along the coastlines of the Indian subcontinent, in comparison to an increase of 14.53% from the landings in 2021. The marine fish landings were reported to have increased by 28.02 percent in 2022 compared to the COVID-19 pandemic year 2020 (CMFRI, (2023). [2]).

The fishing industry has a substantial impact on India's economy and makes a variety of contributions to economic growth. The Gross Domestic Product (GDP) of India is significantly influenced by the fishing industry. Millions of individuals nationwide benefit from the direct and indirect employment it generates. In addition to the value of fish harvested, the processing, marketing, and export of fish and fisheries products all contribute to the fishing industry's GDP contribution (Rajeev, M., & Bhandarkar, S. (2022). [3]). A significant source of employment, particularly in coastal areas, is the fishing industry. Fishermen, fish dealers, boat builders, and employees of fish processing facilities can all make a living from it. The development of infrastructure, such as fishing harbours, jetties, and fish landing facilities, is attracted to the fishing industry. The effectiveness of fish landing, storage, and distribution is increased by these investments. In India, the fishing industry has a broad range of economic effects, from GDP contribution and foreign exchange revenues to job creation and rural development (Mahmud A. et al. (2018). [4]), (Jacob T. et al. (1979). [5]).

2. RELATED RESEARCH WORK :

An Organized Review of Existing Works is based on Google Scholar as the sole search engine for the printed work in journals from 2003 to 2023. The keywords used for the study include "fishing sector," "economic development," "CMFRI," "coastal Karnataka," and "SWOC analysis." Additionally, research reports from reliable international research organizations, websites of fishing industry, pertinent books, articles about the fishing industry, and other governmental websites are included in our secondary sources.

Table 1: Related research work on Economic Impact of the Fishing Industry in Coastal Karnataka

S. No.	Focus/Area	Contribution	References
1	Data pertaining to fisheries	156 fishing villages and 96 fish landing facilities can be found along Karnataka's 300 km of coastline, which is divided among three coastal districts: Dakshina Kannada, Udupi, and Uttara Kannada.	Shyam et al., (2021). [6]
2	GDP of the nation	The contribution of fisheries in the GDP increased from 0.7% in 1980–1981 to 1.2% in 1994–1995.	Vivekanandan et al., (2003). [7]
3	CMRFI report	Increase in the direct and indirect employment in the country	CMFRI (2021). [8]
4	Employment creation	The fishing industry creates employment opportunities, contributing to in the country's economic development.	Jermsittiparsert et al., (2019). [9]
5	Contribution to export	The nation's export business is aided by the fishing industry, which has been expanding annually.	Dhivya et al., (2023). [10]
6	Impact of Climate on Fishing	The fishing operations along the south-eastern Arabian Sea were also impacted by the loss of fishing days brought on by the cyclones in May and October.	Hamza et al., (2021). [11]

3. OBJECTIVES OF THE STUDY :

(1) To study the economic importance of the fishing industry in Coastal Karnataka by examining its contribution to the region's GDP and job creation.

(2) To analyze the fishing sector's contribution to foreign exchange earnings through exports of fish & fisheries products.
(3) To study the Marine Fish landings of Coastal Karnataka in the year 2021-22.
(4) To study the SWOC analysis of the Fishing Industry in India.

4. RESEARCH METHODOLOGY :

The current study is descriptive in nature and employs secondary data collection methods. A variety of secondary sources, including CMFRI reports, case studies, external publications, industry-related articles, and other government websites, were used to gather the material.

5. ECONOMIC IMPORTANCE OF FISHING INDUSTRY IN COASTAL KARNATAKA :

The 300-kilometer-long coastline of Karnataka is home to 156 fishing communities and 88 fish-landing facilities spread throughout three coastal districts: Dakshina Kannada, Udupi, and Uttara Kannada. There are a total of 12 fishing harbors in these coastal areas, with 5 in Uttara Kannada and 7 in Dakshina Kannada. The adoption of contemporary fishing technologies and the pursuit of both qualitative and quantitative improvements in their methods show the local fishermen's admirable commitment to progress. Expanding fleet sizes, cutting-edge trawling techniques, deeper operational depths, longer fishing hours, and widespread use of high-speed engines are a few notable developments (Dineshbabu A. et al. (2022). [12]).

Fish output has significantly increased in coastal Karnataka throughout time. The overall marine fish production in the state climbed from around 3.87 lakh metric tons in 2010 to about 5.02 lakh metric tons in 2022, according to data from the Department of Fisheries, Karnataka. The fishing sector makes contributions through value addition in addition to primary production. Units for processing fish, packaging, and exporting add a lot of value to fishery products. The GDP contribution represents this value addition (Shoichiro. (2022). [13]).

In Coastal Karnataka, the fishing industry is a significant direct employment generator. In 2010, fishing activities in the area directly employed about 1.5 lakh people, according to the Central Marine Fisheries Research Institute (CMFRI). By 2022, this number will have climbed to about 1.8 lakh (CMFRI, (2022). [14]). Additionally, the fishing industry generates indirect employment possibilities in adjacent fields like trade, transportation, marketing, and fish processing. The need for workers across the value chain increases as the sector expands. The livelihood of coastal populations is primarily reliant on fishing. As the industry grows, it offers these communities a stable source of income, lowering poverty and raising the standard of living. The fishing business in Coastal Karnataka is renowned for its inclusivity of both genders, with a sizable proportion of women working in the fish-selling and processing industries. This variety of career options benefits society and the economy (Ayyappan, S., & Krishnan, M. (2004). [15]).

6. THE IMPACT OF THE FISHING INDUSTRY ON FOREIGN EXCHANGE PROFITS FROM THE EXPORT OF FISH AND FISHERIES PRODUCTS :

In terms of seafood exports, the fishing industry in coastal Karnataka has witnessed a spectacular shift between 2010 and 2022, having a substantial impact on the region's contribution to India's foreign exchange profits. According to data from the Marine Products Export Development Authority (MPEDA), exports of seafood had a remarkable increase from over $527 million in 2010 to a noteworthy $1.45 billion in 2022, demonstrating significant export growth. The diverse array of fish and fishery goods produced in the area, which includes Coastal Karnataka in its export basket, is what distinguishes this export boom. Popular varieties like shrimp and prawns have stood out among these and constantly command favorable prices in international marketplaces. As Coastal Karnataka has successfully entered and established its position in international markets and gained respect for the quality and dependability of its seafood exports, this progress has resulted in a noticeable increase in foreign exchange profits (Azad K. N. et al. (2022). [16]).
The fishing sector in India has also achieved amazing progress in engaging with and forging a strong presence in foreign markets. The Americas, Europe, Asia, and the Middle East are just a few of the continents where its influence is noticeable. The stability and superior quality of this region's seafood products have greatly expanded their contribution to the global fish trade. The reputation that the

seafood shipped from coastal Karnataka upholds international standards has boosted its competitiveness and further solidified its position in the global market.

7. MARINE FISH LANDINGS OF COASTAL KARNATAKA IN THE YEAR 2021-22 :

Fish landings are the total amount of marine fish that are captured and transported to either domestic or foreign ports. This statistic, which is an important part of fisheries management, is used to assess the health of fish stocks, monitor the sustainability of fishing operations, and set fishing quotas.
Source: CMFRI, 2023. Marine Fish Landings in India-2022.

Monitoring fish landings assists governments and fisheries management organizations in setting catch limits and putting conservation measures into action. It also serves as a crucial economic indicator, reflecting the economic activity produced by the fishing sector and providing information for evaluating the general health of fishing-dependent coastal communities. In comparison to 2020, the predicted total weight of marine fish landings in Karnataka (550785 t) increased by 47.1% in 2021. However, compared to the average landings in Karnataka during the previous five years, a 13.8% rise was seen (CMFRI, (2022). [14]).

Table 2: Valuation of fish landings across the states 2021-22

Valuation of fish landings across the states 2021-22 (valuation ₹ in crores)					
S. No.	**State**	**Landing Centre**		**Retail Centre**	
		2021	**2022**	**2021**	**2022**
1	West Bengal	2336	3153	2934	4240
2	Andra Pradesh	2808	3221	4048	4638
3	Tamil Nadu	7908	10319	15179	14352
4	Kerala	11639	11053	14304	15146
5	Karnataka	10253	10885	12685	14635
6	Maharastra	2625	3674	3317	4966
7	Gujarat	10138	9937	16138	13849
8	Odisha	3084	2521	4274	3388
9	Puducherry	594	771	815	1105
10	Goa	1139	1146	1301	1463
11	Damam & Diu	1124	1567	1645	2083
	Total	**53648**	**58247**	**76640**	**79865**

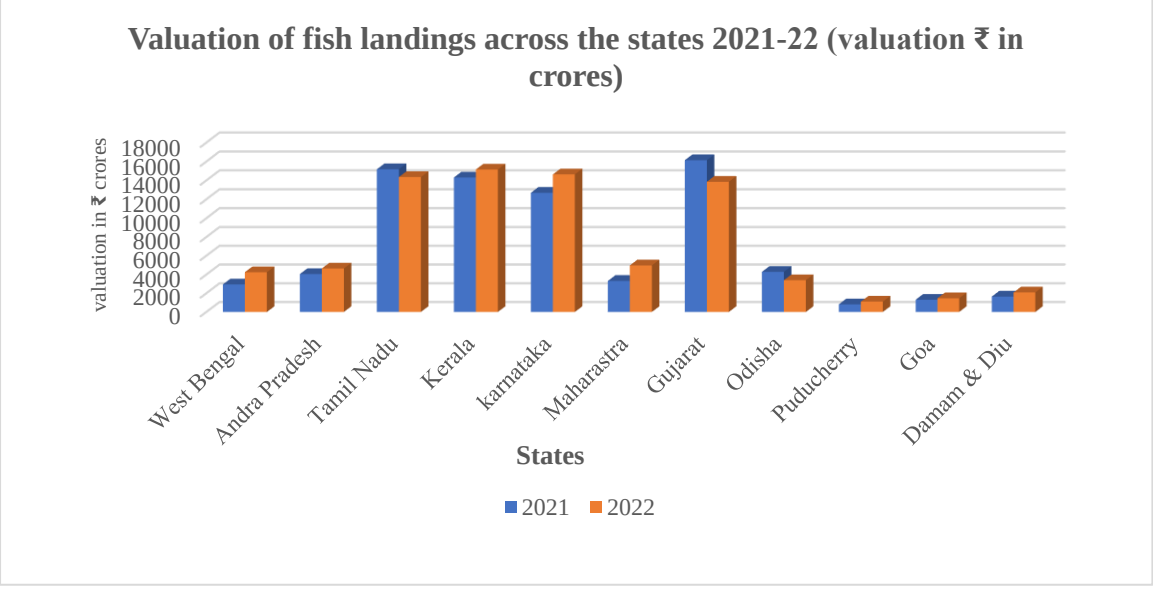

Fig. 1: Valuation of fish landings across the states 2021-22

At the level of landing centers, the expected value of marine fish landings in 2022 was '58247 crores,' an increase of 8.57 percent over 2021, and '79865 crores, an increase of 4.21% over 2021, at the level of retail centers. In comparison to 2021, the average unit price per kilogram of fish was 166.90 at the landing center and 228.84 at the retail center, respectively. A rise of 4.18% from 2021, the marketing efficiency was 72.93%. In 2022, coastal Karnataka began to take a significant role in fishing landings, with renowned fishery harbors like Malpe seeing a notable 22% growth and Mangalore noting an astonishing 43% surge in their respective fish landings. The region's essential position in the fishing sector and its considerable contribution to the nation's economic growth are highlighted by the region's huge increase in fish landings.

8. SWOC ANALYSIS OF FISHING INDUSTRY IN INDIA :

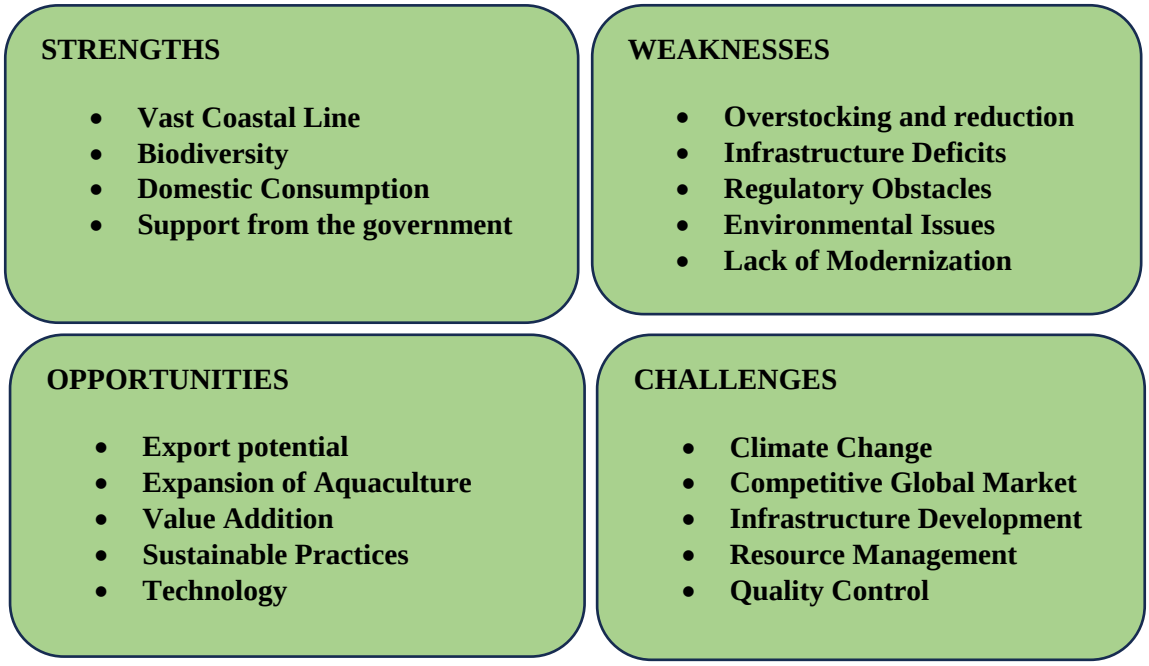

Fig. 2: SWOC analysis of Fishing Industry
Source: Compiled by Researcher

8.1 Strength:

(1) Vast Coastal Line: India's 7,500-kilometer-long coastline offers plenty of opportunity for both marine and inland fisheries, as well as other types of fishing.

(2) Biodiversity: A great variety of fish species are supported by India's different habitats, making it one of the world's top producers of fish. It features a thriving freshwater and marine biodiversity.

(3) Domestic Consumption: Due to dietary customs and cultural preferences, India has a high domestic demand for seafood. For a vast section of the population, seafood is an important source of protein (Celik A et al. (2012). [17]).

(4) Support from the government: The Indian government has launched a number of programs and initiatives to aid the fishing sector, such as the Blue Revolution, which aims to boost fish production and fishermen's revenue.

8.2 Weaknesses:

(1) Overstocking and reduction: Overfishing and Stock Depletion Several fish stocks have been depleted as a result of overfishing and unsustainable fishing methods, endangering the long-term viability of the sector.

(2) Infrastructure Deficits: Post-harvest losses are frequently caused by inadequate post-harvest processing, storage, and transportation infrastructure.

(3) Regulatory Obstacles: The industry's expansion and investment are hampered by complex and inconsistent regulations. Additionally, there are problems with compliance and ineffective regulation enforcement (Pongener, B., & Sharma, A. (2018). [18]).
(4) Environmental Issues: The fishing business has the potential to negatively affect the environment through bycatch, habitat damage, and pollution, which can result in ecological imbalances.
(5) Lack of Modernization: The sector frequently uses antiquated and conventional fishing techniques, which reduces output and efficiency.

8.3 Opportunities:

(1) Export potential: India has the potential to enhance its seafood exports to international markets by taking advantage of the growing demand for seafood that has been responsibly obtained.
(2) Expansion of Aquaculture: There is a great possibility to boost fish production and lessen demand on marine resources by expanding aquaculture, especially in inland locations (Adeli A. et al.(2020). [19]).
(3) Value Addition: Creating processing facilities and goods with added value can increase profitability and broaden market penetration.
(4) Sustainable Practices: Adopting sustainable fishing methods and earning certifications can give fishermen access to upscale markets and guarantee their long-term survival.
(5) Technology: Adopting current technology can boost fishing productivity and resource management. Examples include GPS navigation and fish tracking devices.

8.4 Challenges:

(1) Climate Change: Sea-level rise and changing ocean temperatures have a significant impact on fish migration patterns and habitat, posing a serious danger to the fishing sector.
(2) Competitive Global Market: Global seafood markets are fiercely competitive, with other nations frequently providing comparable goods at competitive pricing.
(3) Infrastructure Development: Although cold storage, shipping, and processing facilities need to be invested in, there are logistical and financial obstacles to overcome (Babatunde A. et al.(2021). [20]).
(4) Resource Management: Effective management of fishing resources is necessary to stop further depletion, but doing so calls for stakeholder participation and strict enforcement.
(5) Quality Control: It's essential for preserving consumer confidence in seafood goods to guarantee consistent quality and safety standards, yet doing so calls for rigorous oversight and regulation.

9 FINDINGS :

Around 1.5 lakh individuals were employed in the fishing sector in Coastal Karnataka in 2010, and that number is anticipated to rise to 1.8 lakh by 2022. Additionally, this industry generates indirect employment opportunities in allied fields like commerce, transportation, marketing, and seafood processing. Fishing is a major source of income for the coastal residents in this area. As the sector grows, it gives these communities a reliable source of income, reducing poverty and raising their level of living. India's fishing sector, particularly in Coastal Karnataka, has successfully entered global markets in the Americas, Europe, Asia, and the Middle East. The quality and adherence to international standards of the region's seafood products enhance their competitiveness and global market share. Fish landings are an economic indication and an important part of fisheries management. The overall weight of marine fish landings in Karnataka increased significantly in 2021 compared to 2020, by 47.1%. However, there was still a noticeable rise of 13.8% when compared to the average landings during the previous five years. According to landing centers, the economic value of marine fish landings in 2022 was predicted to be "58247 crores," an increase of 8.57% from 2021. The value at retail locations was "79865 crores," up 4.21% from 2021. This indicates that the fishing industry's economic impact is on the upswing. The marketing effectiveness in 2022 was 72.93%, which was indicative of a successful supply chain and distribution system for fish products.

10 SUGGESTIONS :

Investing in training and skill-development programs is essential for those working in the fishing sector. The emphasis here should be on value-added products, quality control, and seafood processing in addition to fishing methods. In addition to increasing their market reach, skilled workers can demand

more excellent pricing for their goods. Even if the sector has successfully entered international markets, efforts should be made to diversify even further and look into new markets and product categories. Increased sales may result from diversifying the seafood product line and identifying niche markets. uphold, if not surpass, criteria of excellence set forth by nations for seafood. Maintaining a high standard of quality will further promote economic growth by protecting the current market share and enabling the country to win a larger piece of the global market. Encourage the government to provide subsidies for new fishing equipment, easier credit access, and R&D projects to enhance fishing methods and processing procedures. This may increase output and overall economic output. Government should Continue to monitor fish landings and manage fisheries effectively. To maintain a sustainable and profitable fishing sector, implementing the strategies based on data insights is very much essential.

11 CONCLUSIONS :

The economic and social structure of coastal Karnataka, as well as the economy of India as a whole, is significantly influenced by the fishing sector. It is a sizable source of both direct and indirect employment, lowering poverty and raising living standards in coastal towns. Additionally, the business has achieved notable progress in foreign markets, enhancing India's reputation for premium seafood products. The fishing industry is expanding economically, with significant increases in fish landings and economic value. However, for long-term success and the protection of marine resources, sustainable management techniques and ongoing investments in infrastructure, skill development, and market diversification are crucial. The fishing sector may continue to play a significant role in the local and national economies by implementing these measures.

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