

Economic and nutritional value of marine fish from pimpri fish market

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Abstract

Marine fish play a fundamental role in both global economies and nutrition. This study explores the economic significance and nutritional value of various marine fish species, particularly in the Indian subcontinent. With a focus on both primary and secondary data collection methods, including market surveys and literature reviews, this research emphasizes the contribution of marine fisheries to livelihoods, food security, and national economies. Simultaneously, it investigates the nutritional profiles of key fish species, highlighting their rich content of protein, omega-3 fatty acids, vitamins, and minerals. The paper underscores the importance of sustainable fishing practices and outlines strategies to ensure the continued availability of marine resources for future generations.

Keywords

Marine fish, nutrition, economy, fisheries, sustainability, aquaculture, omega-3, food security

Introduction

Marine fishes are a cornerstone of the global aquatic ecosystem, essential not only for ecological balance but also for economic growth and public health. They serve as a major source of protein for human consumption, contribute significantly to international trade, and support the livelihoods of millions. In coastal nations, the fishing and aquaculture industries form a critical component of economic infrastructure. This paper aims to explore the economic and nutritional value of key marine fish species, elucidating the interdependence between marine biodiversity, human health, and economic sustainability.

Materials and Methods

This study adopted a mixed-methods approach, integrating both qualitative and quantitative research techniques to ensure comprehensive coverage of the topic. Primary data collection was conducted through site visits and field observations at the Nehru Nagar fish market in Pimpri, where firsthand data on fish types, trade volumes, and pricing were recorded. Informal interviews were carried out with fish vendors, fishermen, and consumers to understand local consumption patterns, employment trends, and the cultural significance of specific marine fish.

Surveys were distributed among local consumers to evaluate their knowledge and awareness regarding the nutritional benefits of marine fish. These surveys included questions on dietary habits, frequency of fish consumption, preferred fish species, and perceived health benefits.

In addition to the primary research, a robust secondary research component was undertaken. Data were sourced from peer-reviewed journals, government fisheries department reports, FAO databases, and international publications related to marine ecology, fish trade, and human nutrition. Nutritional data were obtained through literature reviews of scientific analyses detailing the composition of proteins, fats (including Omega-3 fatty acids), vitamins, and minerals in marine fish.

Species for detailed analysis were selected based on their economic significance and prevalence in regional diets. The selected species included Rani fish (*Polynemus paradiseus*), White Pomfret (*Pampus argenteus*), Atlantic Bluefin Tuna (*Thunnus thynnus*), Indian Mackerel (*Rastrelliger kanagurta*), King Mackerel (*Scomberomorus commerson*), Indian Threadfin (*Polynemus indicus*), Tarly fish (*Sardinella longiceps*), Bombay Duck (*Harpadon nehereus*), Golden Anchovy (*Encrasicholina punctifer*), Black Pomfret (*Parastromateus niger*), Croaker fish (*Sciaenidae* family), and Baby Shark (*Scoliodon laticaudus*).

The nutritional value of each species was analyzed per 100 grams of cooked or raw sample, depending on available data. Nutritional components examined included caloric content, protein, total fat, saturated fat, monounsaturated and polyunsaturated fats, cholesterol, and essential vitamins and minerals such as calcium, iron, potassium, magnesium, vitamin D, vitamin B12, and omega-3 fatty acids.

Data were compiled into comparative tables to identify patterns in nutritional richness and economic importance. Economic data also included insights into the value chain—fishing methods, processing techniques, domestic vs. export markets, and value-added products.

Review of Literature

Literature on marine fisheries consistently points to their dual role in economic development and public nutrition. According to the FAO (2020), marine fisheries contribute substantially to GDP in developing countries and provide direct employment to over 200 million people globally. Pauly and Zeller (2016) argue for the importance of accurate catch reconstruction to better understand global fishery trends. Nutritional studies, such as Vasconcellos et al. (2017), emphasize fish as a primary source of omega-3 fatty acids and lean protein, contributing to cardiovascular and cognitive health.

The economic significance of specific fish species has also been well documented. For example, Atlantic Bluefin Tuna is recognized for its luxury market value, while sardines and mackerels serve as staple foods in many coastal communities due to their affordability and nutritional density. However, sustainability remains a pressing concern. Overfishing, habitat degradation, and climate change pose severe risks to marine biodiversity and long-term food security (Muthiga & McClanahan, 2018).

Observation

1. The study focused on twelve marine fish species commonly consumed and traded in the Indian subcontinent
2. *Polynemus paradiseus* (Rani fish) supports artisanal fishing and contributes to local and international seafood markets.
3. *Pampus argenteus* (White Pomfret) is a high-value species favored for its taste and widely exported.
4. *Thunnus thynnus* (Atlantic Bluefin Tuna) is among the most expensive fish globally, with significant roles in export economies and gourmet cuisines.
5. *Rastrelliger kanagurta* (Indian Mackerel) is economically and nutritionally vital for regional diets.
6. *Scomberomorus commerson* (King Mackerel) supports commercial fisheries and has growing aquaculture potential.
7. *Polynemus indicus* (Indian Threadfin) plays an important role in local culinary traditions and employment.
8. *Sardinella longiceps* (Tarly fish) is crucial for affordable protein intake and fish oil production.
9. *Harpadon nehereus* (Bombay Duck) has local cultural significance and contributes to dried fish exports.
10. *Encrasicholina punctifer* (Golden Anchovy) supports fishmeal industries and small-scale fisheries.
11. *Parastromateus niger* (Black Pomfret) is in high culinary demand and being explored for aquaculture.
12. Croaker fish (Family Sciaenidae) are processed for domestic and export markets and support recreational fishing.
13. *Scoliodon laticaudus* (Baby Shark) is consumed for meat and has cultural value, although it requires conservation attention.
14. Nutritional values were recorded per 100 grams of each species, covering energy (kcal), protein, fat types, cholesterol, and essential vitamins and minerals like calcium, iron, potassium, magnesium, and omega-3 fatty acids.

Discussion

The research reveals a strong nexus between marine fisheries and socioeconomic development. Species like Rani fish, Mackerel, and Sardines are essential to food security in low-income regions, while high-value species like Bluefin Tuna and Pomfret drive export earnings. Additionally, species such as Croaker and Bombay Duck provide employment in processing and value-added sectors.

Nutritionally, marine fish are unparalleled. Rich in protein, omega-3 fatty acids, and micronutrients, they play a preventive role in chronic diseases like heart disorders and anemia. The nutritional profiles observed confirm that marine fish are ideal for balanced, low-carb, and high-protein diets.

Sustainability challenges were evident. Overfishing and ecological imbalance threaten fish populations, particularly for species with slow reproduction rates such as Bluefin Tuna and

Baby Shark. Initiatives like marine protected areas, seasonal bans, and aquaculture innovations are crucial to maintaining fish stocks.

Result and Conclusion

Marine fish significantly contribute to economic resilience and public health. The fish species reviewed support millions of livelihoods, generate export revenue, and serve as essential dietary components in both affluent and impoverished regions. The data collected emphasize the dual benefit of marine fish in addressing economic and nutritional needs.

Nutrient	White Pomfret	Atlantic Bluefin Tuna	Bangda (Indian Mackerel)	King Mackerel	<i>Polynemus indicus</i>	Golden Anchovy	Baby Shark
Calories	139	143	207	198	183	271	133
Protein	18.9	24	20	21.5	18.8	33.7	22.8
Fat	6	5.5	12.5	13.5	11	11.5	4
Saturated fat	1.4	1.1	2.7	2.5	2.5	1.65	1.5
Monounsaturated fat	3.4	3.5	5.3	6.6	3.7		1.5
Polyunsaturated fat	1	1.6	3.8	3.5	2.5	8.3	0.75
Cholesterol	59	52	63	62	53		62
Carbohydrates	0	0	0	0	0	0.45	0
Fiber	0	0	0	0	0	0.48	
Sugars	0	0	0	0	0	0.5	

TABLE 1 : COMPARATIVE NUTRITIONAL PROFILING of MARINE FISHES FROM PIMPRI FISH MARKET in Grams/100g

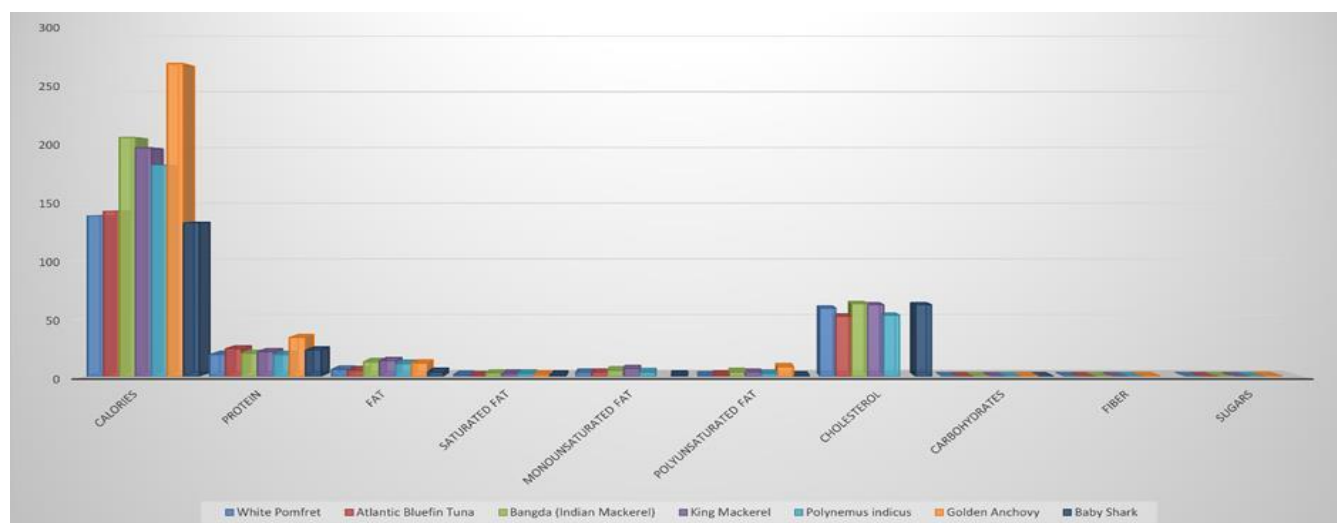
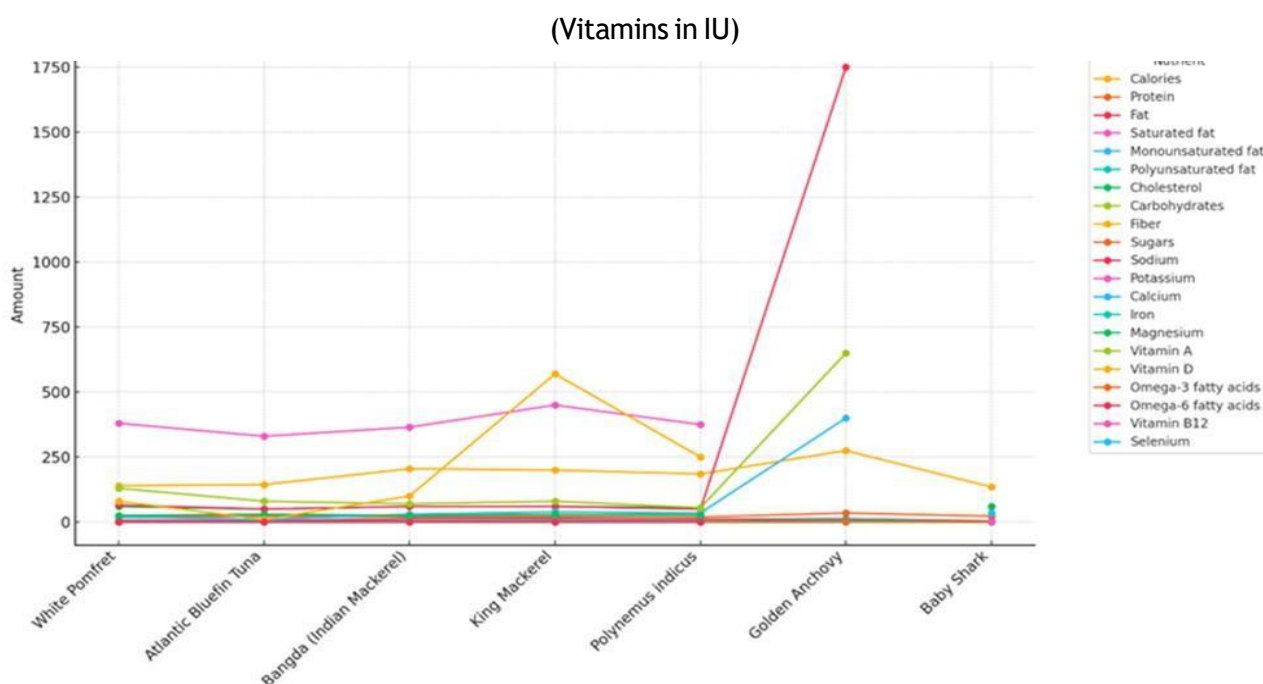


TABLE 1 : COMPARATIVE NUTRITIONAL PROFILING of MARINE FISHES FROM PIMPRI FISH MARKET in Grams/100

However, these benefits are jeopardized by unsustainable practices. Immediate policy reforms, community engagement, and scientific innovation are needed to ensure sustainability. Marine fish, if managed responsibly, will continue to feed and economically support future generations.

Nutrient	White Pomfret	Atlantic Bluefin Tuna	Bangda (Indian Mackerel)	King Mackerel	<i>Polynemus indicus</i>	Golden Anchovy	Baby Shark
Sodium	64	52	66	69	51	1855	
Potassium	373	329	363	455	371		
Calcium	19	12	36	48	35	460	
Iron	0.6	1.2	1.5	0.7	1.35	3.5	1.7
Magnesium	27	31	24	33	27.5		
Vitamin A	129	81	73	87	54	655	
Vitamin D	82	10	110	575	255		Present
Omega-3 fatty acids	0.48	.97	1.5	1.25	0.75	1.49	0.68
Omega-6 fatty acids	0.28	0.3	0.7	0.5	0.4		
Vitamin B12							2.6
Selenium							33

GRAPH 2 : COMPARATIVE NUTRITIONAL PROFILING of MARINE FISHES FROM PIMPRI FISH MARKET in mg/100g



GRAPH 2 : COMPARATIVE NUTRITIONAL PROFILING of MARINE FISHES FROM PIMPRI FISH MARKET in mg/100g
(Vitamins in IU)

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