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Fish for livelihood: Reviewing the price dynamics of fresh and dry Fish trade in Veraval, Gujarat, India

Bengani R.*, Kapila Manoj and Jadvani Dhaval
Department of Aquatic Biology, Veer Narmad South Gujarat University, Surat, Gujarat, India
ranjanabengani@vnsgu.ac.in

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Abstract

This study examined the price levels and profitability of wet and dry fish in the Veraval fish market in Gujarat, India. The field survey, carried out from January 31 to February 9, 2022, collected primary data from 68 wholesale and numerous retail fish traders in the region. Through a detailed price analysis of 61 wet fish varieties and nine dry fish species, this study compared cost-to-selling price margins, explored gender-based market participation, and evaluated existing infrastructure conditions. The findings reveal significantly higher profit margins in the dry fish trade per unit weight, especially considering the minimal infrastructure costs. This study highlights the urgent need for infrastructure improvements in the retail wet fish sector to improve hygiene and working conditions. Additionally, it emphasizes the substantial potential of value-added products, such as dry fish, in supporting the economic welfare of local communities.

Keywords: Fish market, wet fish, dry fish, price analysis, profit margin, socioeconomic.

Introduction

The fisheries sector is a vital socio-economic pillar for coastal communities worldwide, contributing significantly to food security, employment and income generation. Globally, over 120 million people depend directly or indirectly on fisheries and aquaculture for their livelihoods, with small-scale fisheries accounting for more than 90% of global capture fisheries (FAO)[1]. The fisheries sector is one of the main socio-economic drivers of coastal communities globally and contributes significantly to food supply, livelihood, and income.

The Indian fisheries sector plays a vital role in ensuring food and nutritional security, rural employment, and foreign exchange earnings through exports[2,3]. Gujarat is also an important contributor to India, the second-highest fish-producing country in the world, with its extensive coastline and great fishery resources[4]. Fish are perishable items that decay at a very high rate. Accordingly, efficiency in handling, marketing, and processing is required to limit post-harvest losses and maximize economic benefits[5].

Fish is a perishable commodity, and its rapid spoilage requires efficient processing, marketing, and handling to avoid post-harvest loss and maximize economics. While fresh fish will be expensive by kilo, it also requires much infrastructure to keep fresh, such as ice boxes and cold storage, along with tackling transportation and shelf life problems. On the other hand, dried fish, an ancient but low-cost preservation method, can provide a long shelf life and transportability to areas where fresh fish delivery is a problem[5,6]. Being affordable and economical, dried fish is a readily available food option, offering substantial protein and essential micronutrients to impoverished individuals' diets[7]. While substantive, extensive research comparing the economic benefits of fresh and dry fish markets is limited. Salim and co researchers analysed price variation across 25 diverse markets in Kerala, Andhra Pradesh, Maharashtra, and Telangana[8]. Veraval, located in the Gir Somnath district of Gujarat, is a fishing industry hub and the largest fishing harbor in India[4]. Market trend awareness, price mechanisms, and the profitability of fresh (wet) and processed (dry) fish are needed to improve the lives of people depending on it and formulate sustainable market strategies.

This study attempts to fill this gap with a detailed investigation of the profitability and price relationships of fish sold in the Veraval wet and dry fish markets. These results are meant to guide policy interventions towards increasing market efficiency, increasing the level of income for fish traders, and promoting improved sustainable practices.

Methodology

Study Area: The study was conducted in an open fish market situated in Krishna Nagar, Veraval Taluka, Gir Somnath District, Gujarat, India. Veraval's geographical coordinates are 20.9°N, 70.37°E. This market is characterized by both wholesale and retail operations, with daily sales reaching tonnes of fish distributed to cities like Ahmedabad, Surat, Mumbai, and Delhi.

Data Collection: A field survey was conducted from January 31st, 2022, to February 9th, 2022, spanning from 6:00 am to 4:00 AM. Data were collected from both wholesale and retail fish

markets. A structured questionnaire was designed to collect the cost and selling prices of fish varieties observed during the survey. One hundred fourteen traders were interviewed from the wholesale and retail fish markets of the open fish market.

Results and Discussion

Fresh Fish Market Analysis: The Veraval fish wholesale market remained functional from 8:00 am to 8:00 PM and was operated by male wholesalers. Fish, on rickshaws or trucks, were brought to the market from several landing points, such as Jetty, Veraval, Okha, Muldrawka, Diu, Vanakbara, and Mangrol. The wholesale market has nice buildings and good storage facilities, such as ice boxes and refrigerators, and even ice-crushing machines to crush big fish. Sanitary and clean hygienic conditions in the wholesale market.

Fish that are not sold are usually packed in thermocol boxes with ice and auctioned the following day. The distribution of fish in the wholesale market was at the local, district, and state levels, with the prime cities being Ahmedabad, Surat, Delhi, and Mumbai.

In contrast, the Veraval City retail fish market, which was supplied by the wholesale market, had different characteristics. Fish transportation to the retail market lacked cooling facilities. Female retailers have a dominant presence in this segment of the market to a great extent. The most notable finding was that there was no proper building for marketing, and sales were conducted in an open area with no basic facilities such as electricity, water, or drainage. Although a small platform was built, the retailers did not use it for fish selling, and therefore, the overall hygienic conditions were poor. Retailers in this business mostly serve local markets.

A detailed overview of the price status of 61 fish species sold in the Veraval fish market is presented, including both minimum and maximum cost prices and selling prices per kilogram (Table-1).

A notable observation from the study showed a wide range of prices for different species, reflecting variations in demand, availability, and perceived value. 'Ghol' (*Protonibea diacanthus*) commands an exceptionally high price, with a minimum cost of INR 1500 and a maximum selling price of INR 10000 per kilogram, indicating its premium status. Other high-value species include 'Halvo and adadiyo' (*Formio niger*) and 'Hilsa' (*Tenualosa ilisha*). This high valuation could be attributed to its culinary desirability, perceived health benefits, and limited availability, similar to other high-value marine species globally[9].

Conversely, species such as Bumla (*Harpodon nehereus*) and Timri (*Pagrus major*) are available at significantly lower prices[10]. These price disparities are common in diverse fish markets across Gujarat, where species such as pomfret, seer fish, and prawns consistently fetch higher prices than smaller, more abundant varieties[11,12] .

Dry Fish Market Analysis and Profit Comparison: The price status of nine dry fish species in the Veraval fish market was noted (Table-2).

The table highlights the crucial aspect of value addition through processing. Dry fish prices were often quoted per 100 g or per piece rather than per kilogram, indicating a shift in the unit of sale, which can significantly impact perceived value and profit. The recorded cost price of fresh Bumla was INR 20-30/Kg, and the selling price was INR 30-40/Kg. The potential profit per kg was nearly INR 10-20, whereas dry Bumla species was INR 60/100 g. This implies that the value added through drying far outweighs the initial fresh fish cost. This observation aligns with the literature suggesting that dried fish can provide a low-cost source of animal protein with a higher protein concentration by weight, making it an important economic activity for many. Previous research has highlighted that dry fish production can be a profitable business with significant internal and simple rates of return[13].

The dry fish market implicitly benefits from the extended shelf life of its products, reducing spoilage losses that are prevalent in the wet fish sector[5]. This inherent advantage, coupled with the ability to store and transport products without immediate cooling, contributes to higher overall profitability, even with fewer unit sales. Studies have consistently shown that the absence of proper processing facilities and poor quality of dried fish can be major problems, and improved drying processes are crucial[14,15]. Santiago et alexamined drying's effect on physicochemical and nutritional properties of fish, finding that pretreatment and drying methods significantly affect protein content, lipid oxidation, and sensory quality[16]. Previous research highlighted that dry fish production can be a highly profitable business with significant internal and simple rates of return[17,18]. Fish drying is a traditional and economically viable livelihood, particularly in the coastal areas of Gujarat[19,20].

On the Gujarat coast, sun-drying operations in Veraval utilize by-catch species to generate low-cost income streams and contribute to nearly one-third of marine landings entering dried fish value chains[21].

Various studies conducted across India, including in Gujarat, have emphasized that both quality and consumer demand significantly influence the pricing of fresh and dried fish. Research from regions such as Kerala, West Bengal, and coastal Gujarat has consistently shown that well-processed, species-specific dried fish varieties—such as seer fish, ribbonfish, and Bombay duck—command premium prices in the market. Studies by Das et al., Salim et al., and Bengani et al. further revealed that species diversity, drying methods, and market structure play a pivotal role in determining price variations and consumer preferences[22-27].

Table-1: Pricelist of Fresh (wet) Fish Sold in Veraval Fish Market**.**

Local name	Scientific name	Cost price (Kg^{-1})		Selling price (Kg^{-1})	
		Minimum	Maximum	Minimum	Maximum
Apnus	*Coryphaena hippurus*	60	80	70	100
Bhungar	*Mene maculata*	30	35	35	40
Black pikhi	*Carcharhinus macsorrah*	100	150	120	200
Bumla	*Harpodon nehereus*	20	30	30	40
Bur	*Rhinoptera javanica*	60	100	100	120
Chaksi	*Tenualosa ilisha*	30	40	50	60
Dai	*Chirocentrus dorab*	30	50	50	80
Dai / Moti macchi	*Scatophagus argus*	60	80	90	120
Dhamil	*Lethrinus lactarius*	200	250	230	300
Dhumi / Collar	*Micropogonias undulatus*	100	125	125	150
Dola	*Priacanthus hamrur*	30	40	40	50
Don	*Aluterus monoceros*	110	120	140	150
Gagira	*Odonus niger*	20	40	40	50
Gedri	*Auxis thasard*	30	40	50	70
Ghol	*Protonibea diacanthus*	1500	7000	2000	10000
Gobdo	*Sphoeroides panchy gaster*	20	40	30	70
Gomti	*Sillagosihama*	30	32	35	40
Gurka	*Boesemania microlepis*	200	250	250	300
Halvo, adadiyo	*Formio niger*	500	800	700	1200
Hilsa	*Tenualosa ilisha*	800	1000	1000	1200
Jiri	*Sphyraena jello*	25	30	50	100
Khagdo	*Arius thalassinus*	160	200	180	250
Khagri	*Plicofollis tonggol*	20	50	40	100
Kitli	*Ilisha megaloptera*	40	45	50	65
Lal karchlo	*Charybdis cruciata*	30	50	40	70
Lal vekhalu	*Epinephelus diacanthus*	180	200	200	250
Laliyo	*Galeocerdo cuvier*	30	40	35	45
Magaru	*Carcharias limbatus*	120	250	180	300
Magarulathiyo	*Sphyrna lewini*	100	200	110	300

MalbariDayela	*Rastrelliger kanagurta*	120	150	150	170
Mangur	*Clarias batrachus*	30	50	40	80
Meghur	*Remora remora*	20	30	25	50
Morakhi	*Cirrhinus mrigala*	150	200	170	180
Nariela	*Caranx sexfasciatus*	50	80	70	100
Naro	*Muraenesox cinereus*	25	50	30	70
Narsinga	*Lolligo duvaucelli*	90	350	120	400
Paplet	*Pampus argentus*	500	700	600	1200
Paro / Patudi	*Alepes djedaba*	20	30	30	40
Parva fish	*Pseudorasbora parka*	130	150	140	170
Pili vaam	*Anguilla bengalensis*	200	250	250	300
Rajo	*Lutjanus johni*	200	230	210	250
Rani fish	*Nemipterus japonicas*	80	100	120	180
Rohu	*Labeo rohita*	100	150	125	170
Rous	*Eleutheronema tetradactylum*	300	500	500	700
Sagli / Satlu	*Scomberoides comesonnianus*	80	150	130	170
Sakda	*Pangasianodon gigas*	200	250	230	300
Sandhi	*Scoliodon laticaudus*	100	150	120	180
Serva	*Thannus obesus*	100	130	120	140
Shrimp	*Litopenaeus vannamei*	300	400	450	600
Silver bagga	*Lepturacanthus savula*	100	125	125	150
Silver dhoma	*Otolithes cuvieri*	80	90	100	120
Talad	*Sardinella longiceps*	20	22	25	30
Tapkavadokarchlo	*Portunus sanguinolentus*	30	40	50	60
Tilapia	*Oreochromis mossambicus*	25	30	35	40
Timri	*Pagrus major*	10	20	30	40
Vaam	*Muraeneseox cinereus*	150	200	250	300
Varadu	*Dasyatis thetidis*	70	120	100	150
Veer fish	*Istiophorus parva*	100	120	130	150
Veer gedra	*Thannus albacarus*	100	110	110	120
Vekhalu	*Epinephelus tauvina*	100	200	130	250
Vekhalu	*Cephalopholis formosa*	80	150	120	200

Table-2: Pricelist of Dry Fish found in Veraval Fish Market

Fish name	Scientific name	Fresh species price (Rs.) Kg-1	Dried species price (Rs.) Kg-1
Bumla	Harpadon nehereus	20-30	60/100g
Dai	Chirocentrus dorab	30-50	40/no.
Dhamil	Lethrinus ornatus	200-250	100/no.
Magaru	Carcharias limbatus	100-250	120/no.
Nariela	Caranx sexfasciatus	50-80	20/no.
Sagli	Scomberoides comesonnaus	80-150	80/no.
Servo	Thunnus obesus	100-130	120/no.
Varadu	*Dasyatis thetidis*	70-120	70/no.
Vekhalu	*Cephalopholis formosa*	80-150	60/no.

Conclusion

The Veraval fish market, despite being a major hub, reflects sharp differences in profit margins and infrastructure between wet and dry fish trading. Dry fish products offer significantly higher returns per kg, emphasizing the need for investment in fish processing infrastructure, especially for women traders. Policy reforms are necessary to provide fairer, cleaner, and better-equipped retail fish markets in the country.

This study offers a valuable snapshot of the fish marketing system in Veraval, Gujarat, providing quantitative data on prices and qualitative insights into market operations. A comparative analysis of fresh and dry fish profitability enhances understanding of the economic dynamics in the fisheries sector. It underlines the potential for value addition through processing (drying) to achieve higher returns, a key insight for sustainable development and poverty reduction in fishing communities.

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