



DRY FISH PRODUCTION, SPECIES COMPOSITION, AND MARKETING CHANNELS AT VISAKHAPATNAM FISHING HARBOUR, ANDHRA PRADESH, INDIA

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Abstract

Dry fish production is an important traditional fish preservation practice that contributes to food security, nutritional supplementation, and livelihood generation among coastal communities. The present study aimed to evaluate dry fish production, species composition, market price, and marketing channels at Visakhapatnam Fishing Harbour, Andhra Pradesh, India. The study was conducted for a period of three months from January to March 2023 using both primary and secondary data sources. Primary data were collected through structured surveys and interactions with 50 respondents, including dry fish producers, wholesalers, retailers, and consumers operating within the harbour. The findings revealed that dry fish production remains an economically important and widely practised post-harvest preservation technique due to its low processing cost and extended shelf life. Among the dry fish species recorded, *Trichiurus lepturus* contributed the highest proportion (19.53%), followed by *Anchovilla commersonii* (9.19%) and *Rastrilliger kanagurta* (8.25%), whereas *Mornix* sp. (marine eels) and *Drepane* sp. recorded the lowest composition. Market price analysis showed considerable variation among commercially important species, with seer fish and black pomfret attaining premium market prices. Furthermore, the study identified three major marketing channels, with approximately 60% of dry fish directly reaching consumers through producer-based sales. The study highlights the importance of hygienic drying practices and improved marketing systems in strengthening dry fish trade and livelihood opportunities among fisher communities.

Keywords: Dry fish production, Fish preservation, Species composition, Marketing channels, Visakhapatnam Fishing Harbour, Fisheries economics.

Introduction

Fish and fishery products constitute an important source of nutrition and livelihood worldwide, particularly in developing countries where fish serves as a major source of high-quality animal protein, essential fatty acids, vitamins, and minerals. However, fresh fish is highly perishable because of its biochemical composition and susceptibility to microbial spoilage immediately after capture. Consequently, several preservation techniques have been developed to extend shelf life and maintain fish quality for prolonged consumption. Among these methods, drying is one of the oldest and most economical preservation techniques widely adopted across coastal regions [1]. Drying reduces the moisture content of fish, thereby limiting microbial growth and enzymatic deterioration, which significantly improves shelf stability and transportability.

Fish drying has evolved from a traditional subsistence practice to an economically important fish processing enterprise supporting fisher communities. Dried fish products retain much of the nutritional value of fresh fish, including proteins, minerals, calcium, iron, and essential fatty acids, making them a valuable and affordable dietary component among low-income populations [2]. In addition to its nutritional importance, dry fish production contributes substantially to employment generation, particularly among women involved in sorting, salting, drying, processing, packaging, and marketing activities [3]. Furthermore, dry fish products are highly preferred in regions where access to fresh fish is limited due to transportation and storage constraints.

India has a vast marine fishery sector and an extensive coastline that contributes significantly to fish production and processing. Despite advancements in freezing,

canning, and refrigeration technologies, fish drying continues to remain one of the most affordable and widely practised post-harvest preservation methods. A substantial proportion of marine fish catch, particularly low-value species, bycatch, and undersized fish, are converted into dried products for human consumption and industrial applications such as fish meal production [4]. Studies have indicated that dry fish products are extensively marketed across domestic and international markets, contributing to livelihood and fish trade in coastal communities [5].

Visakhapatnam Fishing Harbour, located along the eastern coast of Andhra Pradesh, represents one of the largest fishing harbours in India and serves as an important centre for fish landing, processing, and distribution. The introduction of mechanized fishing vessels and multiday trawling has considerably increased fish availability, thereby enhancing opportunities for fish processing and value addition. Species such as ribbon fish, sardines, anchovies, mackerel, shrimps, and pomfrets are commonly processed into dried fish products due to their high availability and market demand [6]. Dry fish produced at the harbour is supplied to local markets, neighbouring states, and international destinations including Sri Lanka, Singapore, and Myanmar, indicating its commercial importance [7].

Several researchers have investigated various dimensions of dry fish production, including traditional drying methods, microbial quality, nutritional composition, economics, and marketing systems in different coastal regions [2,5,8]. However, information regarding species composition, market structure, dry fish pricing, and marketing channels at Visakhapatnam Fishing Harbour is comparatively limited. A comprehensive understanding of these factors is necessary for minimizing post-harvest losses, improving fish utilization, and strengthening the livelihood security of fisher communities.

Therefore, the present study was undertaken to evaluate dry fish production at Visakhapatnam Fishing Harbour with particular emphasis on species composition, market price, and marketing channels. The findings of the study are expected to provide scientific insights into the economic importance of dry fish production and support improved fish processing, hygienic drying practices, and marketing systems for enhancing livelihood opportunities among coastal fisher communities.

Materials and Methods

Study Area

The present study was conducted at Visakhapatnam Fishing Harbour, Andhra Pradesh, India, one of the major fish landing and trading centres located along the eastern coast of India. Visakhapatnam Fishing Harbour was established in 1976 adjacent to the Visakhapatnam Port and spreads over approximately 26 hectares. The harbour has the capacity to accommodate nearly 700 mechanized boats and 300 beach landing crafts. It serves as an

important centre for fish landing, processing, drying, and marketing activities.

Study Period

The investigation was carried out for a period of three months from January 2023 to March 2023.

Research Design and Data Collection

The study adopted a descriptive and analytical research design based on both primary and secondary sources of information. Primary data were collected through direct field observations, structured questionnaires, and personal interviews conducted with stakeholders engaged in dry fish production and trade. Information regarding fish drying methods, handling practices, species composition, supply chain mechanisms, market prices, and marketing channels was gathered during the survey.

A total of 50 respondents were selected using a random sampling technique from different stakeholder categories, including dry fish producers, wholesalers, retailers, and consumers operating within and around Visakhapatnam Fishing Harbour. Respondents were interviewed to obtain detailed information regarding fish drying practices, commercially important species, market demand, transportation systems, and consumer preference patterns.

Secondary Data Collection

Secondary data relevant to the study were collected from books, journals, magazines, newspapers, reports, and internet sources. Previously published literature on fish drying techniques, dry fish economics, fish marketing systems, and nutritional importance of dried fish products was reviewed to support the study [3-5].

Fish Drying Practices and Species Identification

Observations on fish drying practices were carried out at drying yards and harbour premises. Information related to salting, sun drying, onboard drying, and storage methods was documented. Dry fish species available during the study period were identified based on local nomenclature and available fishery literature. Species composition was expressed in percentage terms to determine the contribution of individual species to total dry fish production.

Statistical Analysis

The collected data were systematically processed, classified, tabulated, and analysed using descriptive statistical methods. Percentage analysis and averages were used to interpret the findings related to species composition, dry fish market prices, and marketing channels. Results were represented through tables and percentage-based interpretations.

Results

Species Composition of Dry Fish

Table 01: Species composition of dry fish recorded at Visakhapatnam Fishing Harbour during January–March 2023

S/N	Name of Species	Percentage (%)
1	<i>Trichiurus lepturus</i>	19.53
2	<i>Sardinella longiceps</i>	5.36
3	<i>Rastrelliger kanagurta</i>	8.25
4	<i>Decapterus</i> sp.	4.16
5	<i>Pellona</i> sp.	1.32
6	<i>Thryssa</i> sp.	2.12
7	<i>Scombroid</i> sp.	6.43
8	<i>Pomadasys</i> sp.	3.49
9	<i>Sphyræna jello</i>	0.52
10	<i>Nemipterus</i> sp.	0.47
11	<i>Nebia maculatus</i>	1.31
12	<i>Saurida tumbil</i>	4.28
13	<i>Upeneus vittatus</i>	3.19
14	<i>Leognathus</i> sp.	5.38
15	<i>Mornix</i> sp. (Marine eels)	0.21
16	<i>Johnius dussimeri</i>	6.13
17	<i>Cynoglossus</i> sp.	0.52
18	<i>Drepane</i> sp.	0.31
19	<i>Acetes</i> sp.	4.37
20	<i>Anchoviella commersonii</i>	9.19
21	<i>Parastromateus niger</i>	6.32
22	Shrimps	7.14

The species composition of dry fish recorded at Visakhapatnam Fishing Harbour during the study period (January–March 2023) is presented in Table 01. Considerable variation was observed in the percentage composition of fish species processed for drying. Among the recorded species, *Trichiurus lepturus* contributed the highest proportion (19.53%), followed by *Anchoviella commersonii* (9.19%) and *Rastrelliger kanagurta* (8.25%). Moderate percentages were observed for shrimps (7.14%), *Scombroid* species (6.43%), *Parastromateus niger* (6.32%), and *Johnius dussimeri* (6.13%). Species such as *Leognathus* sp. (5.38%), *Sardinella longiceps* (5.36%), and *Acetes* sp. (4.37%) also represented notable proportions in dry fish production. The lowest percentage contribution was observed for *Mornix* sp. (marine eels) (0.21%), followed by *Drepane* sp. (0.31%) and *Nemipterus* sp. (0.47%).

Market Price of Dry Fish

Table 02: Market price of dry fish at Visakhapatnam Fishing Harbour

S/N	Fish Group	Market Price (Rs./kg)
1	Ribbon fish	80–100
2	Seer fish	400–600
3	Mackerel	60–80
4	Sardines	30–50
5	Black pomfret	300–500

6	Goat fish	30–50
7	Lizard fish	70–90
8	Croakers	60–80
9	Silver bellies	50–70
10	Shrimps	200–400
11	Acetes	100–150
12	Anchovy	300–500

The market price of dry fish at Visakhapatnam Fishing Harbour is presented in Table 02. Considerable variation in market price was observed among fish groups. Seer fish recorded the highest market price (Rs.400–600/kg), followed by black pomfret (Rs.300–500/kg) and anchovy (Rs.300–500/kg). Shrimps were priced between Rs.200–400/kg, while ribbon fish, mackerel, croakers, and lizard fish ranged between Rs.60–100/kg. Sardines and goat fish recorded comparatively lower prices ranging from Rs.30–50/kg.

Marketing Channels of Dry Fish

Table 03: Marketing channels of dry fish at Visakhapatnam Fishing Harbour

Marketing Channel	Distribution Pathway	Percentage (%)
Channel I	Producer → Consumer	60
Channel II	Producer → Retailer → Consumer	25
Channel III	Producer → Wholesaler → Retailer → Consumer	15

The marketing channels of dry fish are presented in Table 03. The study revealed that approximately 60% of dry fish reached consumers directly from producers. About 25% of dry fish was marketed through retailers, whereas the remaining 15% reached consumers through wholesalers and retailers.

Discussion

The present study demonstrated that dry fish production at Visakhapatnam Fishing Harbour plays an important role in fish preservation, livelihood generation, and fish trade among coastal communities. Drying remains one of the oldest and most economical post-harvest preservation methods that reduces moisture content and prevents microbial spoilage, thereby increasing shelf life and availability of fish products [1]. Similar observations were reported by Kallon et al. [2], who emphasized the nutritional and economic importance of dried fish products in fisheries.

The findings of the present study revealed considerable variation in species composition of dry fish at Visakhapatnam Fishing Harbour. Among the recorded species, *Trichiurus lepturus* (19.53%), *Anchoviella commersonii* (9.19%), and *Rastrelliger kanagurta* (8.25%) constituted the major proportion of dry fish production. Comparable observations were reported by Das et al. [6], who documented the dominance of ribbon fish and mackerel species in dry fish production at Visakhapatnam Fishing Harbour.

The market price of dry fish varied considerably among fish groups. Seer fish and black pomfret recorded higher market prices, whereas sardines and goat fish showed comparatively lower prices. Similar findings were reported by Madan et al. [7], who observed that commercially important fish species generally attained comparatively higher market prices in dry fish trade.

The study also revealed that dry fish reached consumers through different marketing channels, with nearly 60% directly marketed from producers to consumers, while the remaining quantity was distributed through retailers and wholesalers. Similar observations on dry fish marketing systems have been reported in previous studies [4,7].

The findings further indicated the importance of hygienic fish drying practices at Visakhapatnam Fishing Harbour. Fish intended for human consumption was generally salt cured and dried on clean platforms or drying yards to reduce contamination and maintain product quality. The adoption of hygienic drying methods may improve the quality and acceptability of dry fish products [5].

Overall, the findings of the present study support earlier reports on dry fish production and marketing systems in coastal fisheries [4,6,7]. Improvement in drying facilities, hygienic processing methods, and marketing systems may contribute to strengthening dry fish trade and livelihood opportunities among fisher communities.

Conclusion

The present study highlighted the importance of dry fish production at Visakhapatnam Fishing Harbour as a major fish preservation practice contributing to food security, employment, and livelihood generation among coastal communities. The findings revealed that *Trichiurus lepturus*, *Anchoviella commersonii*, and *Rastrelliger kanagartha* were the dominant species in dry fish production, whereas species such as *Mornix* sp. and *Drepane* sp. contributed minimally. Considerable variation in market prices was observed among fish species.

The study further indicated that direct producer-to-consumer marketing was the dominant distribution channel. Overall, dry fish production at Visakhapatnam Fishing Harbour has developed into an important livelihood activity. Improvement in hygienic drying practices, infrastructure facilities, and marketing systems may further enhance the quality and utilization of dry fish products.

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Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Both authors contributed equally to the conception, data collection, analysis, manuscript preparation, and approval of the final version.

Ethical Approval

Ethical approval was not required for this study as it involved questionnaire surveys and interviews only.

Informed Consent

Informed consent was obtained from all participants prior to data collection.

Data Availability Statement

Data supporting the findings of this study are available from the corresponding author upon reasonable request.

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