

# Marketing Channels, Efficiency and Constraints in Marine Fish Trade: Evidence from Thoothukudi District, Tamil Nadu

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**Abstract**—Marine fisheries are vital to Tamil Nadu's coastal residents. The fishermen confront marketing challenges such as pricing fluctuations, intermediary control, and demand and supply instability. This study examines marine fish domestic selling in six Thoothukudi communities. The article studies existing marketing channels, analyses their efficiency for different species, analyses marketing limitations using Garrett ranking, and estimates marketing costs and margins. The main data came from 150 questionnaire responses. Channel IV was the least efficient, whereas Channel III had the largest percentage of fisherman (81.81%) and Shepherd index values of 5.5, 4.3, and 2.1, Acharya and Agarwal index values of 4.5, 3.3, and 1.1. Price fluctuation (77.00), lack of negotiating power (67.17), and middlemen exploitation (65.83) were major restrictions, whereas intermediaries cited price volatility (72.83), unclear demand (69.83), and supply variability (66). Shorter routes boost efficiency and profits, while resolving limits boosts the efficacy of marketing.

**Index Terms**—Fishermen's Share, Garrett Ranking, Marine Fish Marketing, Marketing Channels, Marketing Efficiency.

## I. INTRODUCTION

Fish is a cheap and abundant way to get protein, and it's also one of the best ways to prevent malnutrition and starvation. With a share of around 8% in worldwide fish output, India is the second-largest fish producing nation [1]. There was a considerable growth in India's fish output, which reached 197.75 lakh tonnes in FY 2024-25, up from 95.79 lakh tonnes in FY 2013-14. [2]. The total marine fish landings in India during 2024 were estimated at about 3.47 million tonnes. Gujarat was the leading contributor finishing in third place with 7.54 lakh tonnes, followed by

Kerala with 6.10 lakh tonnes and Tamil Nadu with 6.79 lakh tonnes [3]. West Bengal (2.33 lakh tonnes) and Maharashtra (3.11 lakh tonnes) also contributed significantly to the total landings (CMFRI, 2024). Together, these states accounted for a substantial portion of the seafood harvest in the country, reflecting regional dominance in marine fisheries. With a coastline of around 11,098.81 km, India comprises about 1,068.69 km belonging to Tamil Nadu [4]. This indicates that the state is quite crucial in marine fisheries, which involves 608 marine fishing villages found in 14 coastal districts. As far as the Thoothukudi district is concerned, its total coast length stands at 163.5 km, where all its coast lies about the area around the Gulf of Mannar (Department of Fisheries, Government of Tamil Nadu, 2022-23). Hence, Thoothukudi can be regarded as one of the major coastal districts of Tamil Nadu. The Gulf of Mannar Region situated in the southern region of Nadu, India is known to be one of the most diverse marine biodiversity regions globally (Department of Fisheries, Government of Tamil Nadu, 2022-23). There are several structural and operational problems associated with the domestic fish marketing structure in Tamil Nadu's coastal areas. Even though the fisheries sector contributes immensely to the livelihoods and nutritional status of people in the state, the fish marketing system continues to be poorly structured and controlled by intermediaries. At the fishermen's level, for instance, there is a problem associated with the small share that they receive in terms of the consumer's rupee. This is because of the involvement of different intermediaries including the auctioneers, commission agents and traders. According to 'Aswathy et al. (2014), the efficiency' of

marketing fish, marketing costs, and margins were studied in Kerala and it was observed that there were large margins realized by different intermediaries in the fish marketing chain. Fishermen are forced to borrow from informal sources and this forces them to market their products using particular agents thus making it difficult to get competitive prices for their products. There is also the issue of deductions made on fish auction charges, commissions, and traders' discount. Fish being perishable goods, fishermen have to market their products immediately they catch the fish.

Apart from structural constraints, there are a number of marketing constraints that impact the efficient operations of the marketing of fish system. Price fluctuations, spoilage, and perishability of fish along with uncertain market demand are some of the marketing constraints faced by both fishermen and marketers that impact the inefficiency of the marketing system. According to [5], there are a number of marketing constraints such as price fluctuation, absence of storage facilities, high transportation cost, and perishability, which make marketing expensive, widen the price range, and lower its efficiency.

However, the previous research has focused on marketing cost, margin, and efficiency individually without much emphasis on the integration between marketing channels, efficiency, and constraints. Firstly, there has been no comparative study of several marketing channels. Secondly, little attention has been paid to the differences among various fish types. Thirdly, the concept of efficiency has not been evaluated from the fishermen's perspective. Lastly, the relationship between marketing constraints and the performance of marketing channels has never been established before. Hence, a comprehensive study is needed to examine the interrelationships of marketing channels, efficiency, and constraints on the performance of marine fish marketing systems. An effective evaluation of marketing channels and their efficiency can help formulate appropriate policies that need to be followed in the marine fisheries sector. Based on the findings of the study, policymakers will be able to formulate appropriate strategies for reducing marketing inefficiencies, improving price transmission, and increasing the profitability of the fish marketing system [6]. Moreover, this study will be helpful in ensuring the financial stability of fishermen through higher margins according to the buyer's rupee.

Moreover, any improvements in the advertising medium efficiency may aid the establishment of a structured fish marketing chain, leading to efficient market entry and price realization for all parties involved.

Against with this background in mind, this paper's principal goal is to analyze the functional and structural components of marine fish marketing chains and determine major constraints facing their efficiency in the Thoothukudi district of Tamil Nadu state.

## II. MATERIALS AND METHODS

### A. Study Area

Purposeful sampling was done, and Thoothukudi district, which is a marine fish-producing district, was chosen from the state of Tamil Nadu because of its high production rate, as well as its location in the Gulf of Mannar, a marine fishing hotspot (Tamil Nadu Government, Department of Fisheries), 2022–23). Six major fishing villages, namely Manapad, Alanthalai, Punnaikayal, Singithurai, Kombuthurai, and Therespuram, located in Thoothukudi and Tiruchendur blocks, were selected for the study.

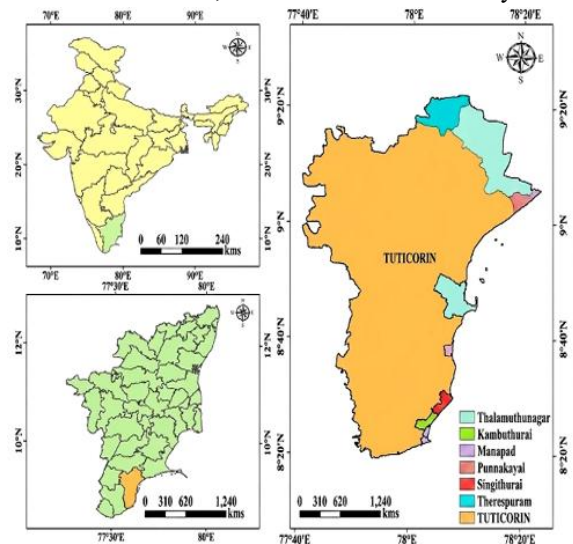


Figure 1. Study Area

Source: Author Computation

### B. Sampling Technique

The researchers used a multi-stage purposive-cum-random sampling strategy for the study. In the first stage, Thoothukudi district and selected fishing villages were chosen purposively based on their importance in marine fisheries. In the final stage,

respondents were selected randomly from different categories of stakeholders, with proportionate representation ensured across fishermen and various market intermediaries.

#### C. Sample Size and Distribution

As said, to insert images in Word, position the cursor at the insertion point and either use Insert | Picture | From File or copy the image to the Windows clipboard and then Edit | Paste Special | Picture (with —Float over text unchecked) One hundred fifty people were chosen to participate in the research, comprising fishermen (60), auctioneers (15), commission agents (15), wholesalers (30), and retailers (30). Fishermen were selected from the six villages at the rate of 10 respondents per village.

#### D. Data Collection

Fishermen were the primary sources of data collection and various market intermediaries through in-person interviews conducted utilizing a tried-and-true structured interview protocol. Fish were categorized into high, medium, and low-value groups for analysis.

#### E. Analytical Tools

##### Price Spread:

Price spread was calculated to the extent that it represents the profit margin for fisherman as compared to the selling price. Price spread = Retail price – Net price received by the fishermen per kg of fish.

##### Fishermen's Share in Consumer Price

Fishermen's part in the consumer price was determined by dividing their portion of the price they got by the price they paid by consumers.

$$\text{Fishermen share in Consumer Price (\%)} = \frac{\text{Net price received by fishermen}}{\text{Price paid by consumer}} \times 100.$$

##### Marketing Cost and Margin

The sum of all costs involved in transporting fish from the fisherman to the customer is known as the marketing cost, including transportation, loading and unloading, icing, storage, packaging, and market fees. Margin in marketing is the amount by which the selling price exceeds the buying price of intermediaries in the marketing channel.

#### Marketing Efficiency

Marketing efficiency was assessed using Shepherd's index and the Acharya and Agarwal method.

### III. SHEPHERD'S INDEX

[7] proposed a marketing efficiency index for assessing the performance of marketing systems, which has been widely adapted in empirical studies as the ratio of consumer price to the total marketing cost and margins, where higher values indicate greater marketing efficiency.

$$E = \frac{\text{Consumer Price}}{\text{Total marketing cost} + \text{Total marketing margin}}$$

A higher value of the index indicates greater marketing efficiency. [8] examined the marketing of marine fish in the Ramanathapuram district of Tamil Nadu, taking into account the efficiency of the industry, the price spread, and the proportion of the consumer rupee that went to the fishermen. Marketing efficiency was better for high-value fish than for low-value fish, according to the research fish.

### IV. ACHARYA AND AGARWAL METHOD

[9] proposed a marketing efficiency measure based on the producer's net price as a percentage of their entire marketing expenditure and marketing margins, highlighting that higher values indicate better efficiency and improved producer share in the marketing system.

$$E = \frac{\text{Net price received by fishermen}}{\text{Total marketing cost} + \text{Total marketing margin}}$$

A higher value indicates better efficiency and greater producer share. [10] analysed the marketing efficiency of selected fish species in Bangladesh using the Acharya and Agarwal approach, defined as the ratio of farmers' net prices paid to their total marketing costs plus margin. The study found that higher value fish exhibited greater marketing efficiency due to better price realization and lower relative costs.

#### A. Garrett Ranking Technique

[11] developed the Garrett ranking technique as a systematic method to convert ranks assigned by respondents into scores, enabling the identification and prioritization of key constraints based on their relative importance.

The constraints limiting the marketing of fish products were determined using the Garrett ranking method. The ranks assigned to the constraints the results were converted into percentage rankings using the method below:

$$\text{Percentage position} = \frac{100 \times (R_{ij} - 0.5)}{N_j}$$

where  $R_{ij}$  = Rank given for the  $i$ th factor by  $j$ th individual,  $N_j$  = Number of factors ranked by  $j$ th individual.

Then, using standard tables, the % rankings were converted to Garrett scores. The Garrett scores were averaged, and the constraints were ranked depending on their mean scores, where a higher mean score indicated a more critical constraint. According to [12], major constraints included inadequate storage, transportation, infrastructure, and standardization of fish products.

## II. RESULTS AND DISCUSSION

### A. Fish Marketing System

Fish market channeling is a decentralized activity with many intermediary agents working at varying levels of marketing channels in coastal villages of Thoothukudi district. Primary fish landing centres form important points where the fishing community sells its fish catch through either auction process or sales to retailers and consumers. Several variables impact the fish marketing process, including catch size, market prices, types of fish caught, and instant money requirements for fishermen. Auction, which is locally termed "elam," takes the dominant role in fish sale process while direct selling occurs for small catches or low-priced fish. Fishes are marketed through various means ranging from mini-lorries to two-wheelers, with high-priced fishes exported sometimes. Four primary fish marketing channels have been identified following the field study, characterized by the involvement of a variable number of intermediary agents.

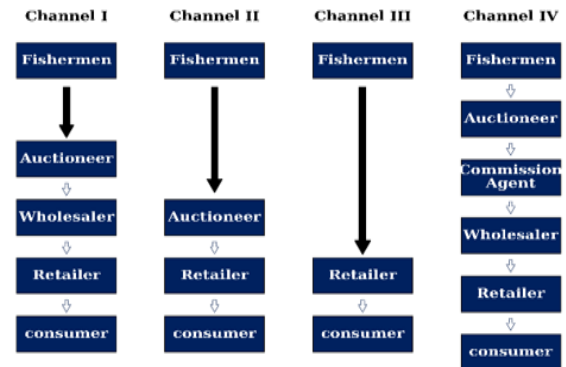


Figure 2. Comparative Illustration of Fish Marketing Channels (Channel I, II, III and IV) from Fishermen to Final Consumer

Source: Author Computation

### B. Structure of Marketing Costs and Margins

Net revenue received by the fishermen was the market value less trade discounts and market fees, which could vary from 5% to 10% depending on the credit extended to the moneylenders, or vattakarars, or about 1% in case credit facilities were not available. A company's gross marketing margin (GMM) is the sum of its marketing expenditures plus any possible intermediate margins. Marketing cost included all costs like transport, icing, loading/unloading, sorting and grading, and packaging. Labor charges varied between ₹700 and ₹1000 per day, whereas ice cost about ₹150 per bar, and one bar was sufficient to keep up to 60 kg fish. Transportation costs varied with distance and formed a major component across all stages. At wholesaler and retailer levels, additional costs included re-icing, storage, handling, and market fees. Spoilage and quality deterioration contributed to implicit losses, particularly for low-value fish, while small-scale vendors incurred lower total costs but higher per-unit costs due to limited scale.

### C. Marketing Cost, Margin and Efficiency Analysis

Channel I in table 1. shows a moderate but margin-dominated structure, with price spread highest for high-value fish (₹470/kg), followed by medium (₹305/kg) and low-value fish (₹107/kg). [13] and [14] analyzed fish marketing in Cuddalore district using fisherman's cut of the consumer rupee and the pricing differential, and reported higher price spread for high value fish with fishermen receiving around 50 per cent or more of the consumer's rupee. This variation is

mainly driven by higher marketing margins (₹339.3, ₹228.49, ₹52.81/kg), rather than costs (₹60.7, ₹41.51, ₹47.19/kg), indicating that intermediary gains are the major contributor to price spread. The fishermen's share declines from 57.3% (high-value) to 37.06% (low-value), reflecting weaker price realization in lower-value segments. The share of marketing margin in consumer price remains substantial (30.84–36.85%), highlighting the dominance of intermediaries. Overall, the channel is characterized by high margins and wide price spread, suggesting inefficient price transmission and reduced producer returns.

Table 1. Structure of Marketing Costs and Margins in Channel I

| Particulars                                      | High value fish (₹ Per Kg) | Medium value fish (₹ Per Kg) | Low value fish (₹ Per Kg) |
|--------------------------------------------------|----------------------------|------------------------------|---------------------------|
| Landing centre price                             | 700                        | 350                          | 70                        |
| Auction charges                                  | 70                         | 35                           | 7                         |
| Net price received by fishermen                  | 630                        | 315                          | 63                        |
| cost of Transport                                | 1.5                        | 2.22                         | 2                         |
| Ice cost                                         | 2                          | 2.22                         | 1.8                       |
| Loading/Unloading charges                        | 2                          | 2.77                         | 2                         |
| Labour charges (cutting, weighing and packing)   | 4                          | 5.55                         | 5                         |
| Stall rent                                       | 0.1                        | 0.1                          | 0.1                       |
| Other expenses                                   | 1                          | 1                            | 1.5                       |
| Wholesaler's margin                              | 189.4                      | 136.14                       | 27.6                      |
| Retailer's purchase price                        | 900                        | 500                          | 110                       |
| cost of Transport                                | 30                         | 15.306                       | 20.83                     |
| Ice cost                                         | 6                          | 4.08                         | 4.16                      |
| Stall rent                                       | 0.1                        | 0.1                          | 0.1                       |
| Labour charges (cutting, weighing and packing)   | 14                         | 8.16                         | 9.7                       |
| Retailer's margin                                | 149.9                      | 92.354                       | 25.21                     |
| Retail price                                     | 1100                       | 620                          | 170                       |
| Price spread                                     | 470                        | 305                          | 107                       |
| Marketing cost                                   | 60.7                       | 41.506                       | 47.19                     |
| Marketing margin                                 | 339.3                      | 228.494                      | 52.81                     |
| Fishermen's share in consumer rupee              | 57.3                       | 50.8                         | 37.05882                  |
| Percentage of marketing margin in consumer rupee | 30.84545                   | 36.85387                     | 31.06471                  |

Source: Author Computation

Table 2. shows that it has a favorable cost and margin position as it has less price spread between ₹55/kg and ₹265/kg. The marketing cost stays relatively low (₹26.96–₹28.09/kg) but the margins are moderate (₹21.91–₹173.03/kg). Thus, it implies limited intermediary operations in the process of marketing. Fishermen have a greater share in the price (between 45% and 68.82%), indicating effective price realization. Also, the marketing margin as a percentage of consumer price is less than before (20.4% to 22.2%). Thus, this channel has low price spread and margins due to the minimal intermediary operations.

Table 2. Structure of Marketing Costs and Margins in Channel II

| Particulars                                      | High Value fish (₹ Per Kg) | Medium value fish (₹ Per Kg) | Low value fish (₹ Per Kg) |
|--------------------------------------------------|----------------------------|------------------------------|---------------------------|
| Landing centre price                             | 650                        | 300                          | 50                        |
| Auction charges                                  | 65                         | 30                           | 5                         |
| Net price received by fishermen                  | 585                        | 270                          | 45                        |
| Cost of transport                                | 16.129                     | 16.12                        | 16.66                     |
| Ice cost                                         | 3.22                       | 3.22                         | 3.33                      |
| Labour cost                                      | 7.52                       | 7.52                         | 8                         |
| Stall rent                                       | 0.1                        | 0.1                          | 0.1                       |
| Retailer's margin                                | 173.03                     | 93.04                        | 21.91                     |
| Retail price                                     | 850                        | 420                          | 100                       |
| Price spread                                     | 265                        | 150                          | 55                        |
| Marketing cost                                   | 26.97                      | 26.96                        | 28.09                     |
| Marketing margin                                 | 173.03                     | 93.04                        | 21.91                     |
| Fishermen's share in consumer rupee              | 68.82                      | 64.28                        | 45                        |
| Percentage of marketing margin in consumer rupee | 20.4                       | 22.2                         | 21.91                     |

Source: Author Computation

Channel III mentioned below appears to have the best combination of cost and margins among all the channels, as its price range is quite low (₹70–₹200/kg) relative to other channels. Marketing costs do not appear to be high (₹27.64–₹36.1/kg), nor do margins seem to be very high (₹33.9–₹164.9/kg). There seems to be no extensive intermediation in this channel. It can be seen that the fisherfolk's share in the total value

chain is relatively high, being between 53.33% and 81.81%. Overall, the channel is characterized by lower price spread, controlled margins, and higher producer share, indicating a streamlined marketing structure with minimal intermediation.

Table 3. Structure of Marketing Costs and Margins in Channel III

| Particulars                                      | High Value fish (₹ Per Kg) | Medium Value fish (₹ Per Kg) | Low Value fish (₹ Per Kg) |
|--------------------------------------------------|----------------------------|------------------------------|---------------------------|
| Landing price                                    | 900                        | 500                          | 80                        |
| Net price received by fishermen                  | 900                        | 500                          | 80                        |
| Cost of transport                                | 20                         | 15.3                         | 20                        |
| Ice cost                                         | 5                          | 4.08                         | 6                         |
| Labour cost                                      | 10                         | 8.16                         | 10                        |
| Stall rent                                       | 0.1                        | 0.1                          | 0.1                       |
| Retailer's margin                                | 164.9                      | 122.35                       | 33.9                      |
| Retail price                                     | 1100                       | 650                          | 150                       |
| Price spread                                     | 200                        | 150                          | 70                        |
| Marketing cost                                   | 35.1                       | 27.64                        | 36.1                      |
| Marketing margin                                 | 164.9                      | 122.35                       | 33.9                      |
| Fishermen's share in consumer rupee              | 81.81                      | 77                           | 53.33                     |
| Percentage of marketing margin in consumer rupee | 15                         | 18.82                        | 22.6                      |

Source: Author Computation

Channel IV in table 4. exhibits the least favorable cost and margin structure, with the highest price spread ranging from ₹134 to ₹560/kg. Marketing costs are also relatively high (₹38.66–₹81.08/kg), while margins are the highest among all channels (₹66.64–₹418.9/kg), indicating heavy intermediary involvement. The fishermen's share is considerably lower, declining from 49.09% (high-value) to 21.17% (low-value fish), reflecting poor price realization. In addition, the proportion of marketing margin in consumer price is the highest (38–44.47%), showing that a large share of the consumer price is absorbed by intermediaries. Similar observations were made by [15], who found that the marketing channel saw a rise in both costs and profits due to the participation of several middlemen, resulting in lower marketing efficiency. Overall, the channel is characterized by

high costs, excessive margins, and wide price spread, indicating strong inefficiencies due to multiple layers of intermediation.

Table 4. Structure of Marketing Costs and Margins in Channel IV

| Particulars                                      | High Value fish (₹ Per Kg) | Medium Value fish (₹ Per Kg) | Low Value fish (₹ Per Kg) |
|--------------------------------------------------|----------------------------|------------------------------|---------------------------|
| Landing centre price                             | 600                        | 350                          | 40                        |
| Auction charges                                  | 60                         | 35                           | 4                         |
| Net price received by fishermen                  | 540                        | 315                          | 36                        |
| Transport cost                                   | 3.33                       | 6                            | 5                         |
| Ice cost                                         | 2.5                        | 2.4                          | 3                         |
| Labour cost                                      | 11.66                      | 10                           | 10                        |
| other expenses                                   | 2.5                        | 1.5                          | 3                         |
| Commission agent's margin                        | 130.01                     | 80.1                         | 9                         |
| Wholesaler purchase price                        | 750                        | 450                          | 70                        |
| Cost of transport                                | 2.14                       | 1.6                          | 3.33                      |
| Ice cost                                         | 2.85                       | 1.28                         | 8.33                      |
| Loading/unloading costs                          | 2.4                        | 2.4                          | 2                         |
| Stall rent                                       | 0.1                        | 0.1                          | 0.1                       |
| Labour cost                                      | 6                          | 6                            | 6                         |
| other expenses                                   | 1.5                        | 1.2                          | 1.5                       |
| Wholesaler's margin                              | 135.01                     | 137.42                       | 28.74                     |
| Retailer's purchase price                        | 900                        | 600                          | 120                       |
| Cost of transport                                | 30                         | 2.61                         | 10                        |
| Ice cost                                         | 6                          | 3.57                         | 4                         |
| Stall rent                                       | 0.1                        | 0                            | 0.1                       |
| Labour cost                                      | 10                         | 0                            | 7                         |
| Retailer's margin                                | 153.9                      | 93.82                        | 28.9                      |
| Retail price                                     | 1100                       | 700                          | 170                       |
| Price spread                                     | 560                        | 385                          | 134                       |
| Marketing cost                                   | 81.08                      | 38.66                        | 63.36                     |
| Marketing margin                                 | 418.9                      | 311.34                       | 66.64                     |
| Fishermen's share in consumer rupee              | 49.09                      | 45                           | 21.17                     |
| Percentage of marketing margin in consumer rupee | 38                         | 44.47                        | 39.2                      |

Source: Author Computation

#### D. Marketing Efficiency

The researchers used a multi-stage purposive-cum-random sampling strategy for the study. In the first stage, Thoothukudi district and selected fishing villages were chosen purposively based on their importance in [16] fisheries. In the final stage, respondents were selected randomly from different categories of stakeholders, with proportionate representation ensured across fishermen and various market intermediaries from table 5., outcome clearly shows that marketing efficiency improves as the length of the marketing channel decreases. Channel III is the most efficient among all three fish channels at 5.5, 4.3, and 2.1 respectively, while Channel IV is the least efficient with figures of 2.2, 2.0, and 1.31. This is based on the correlation between channel design, marketing costs, and margins. In case of short channel, like Channel III, there are fewer intermediaries whose presence keeps marketing costs down because of lesser need for transportation, refrigeration, handling, and labor. Consequently, the marketing cost and margin components will be low compared to the consumer price. On the other hand, long channels like Channel IV have numerous intermediaries contributing towards cost and margin. In contrast, Channel II is the middle ground, where there is a decrease in intermediaries, resulting in lower marketing costs and greater efficiency (4.25, 3.5, and 2.0) than those for Channel I (2.75, 2.3, and 1.7). This supports the idea that even a partial reduction increases efficiency. Efficiency tends to drop from high-value fish to low-value fish across all the channels due to the fact that marketing expenses constitute a significant proportion of the selling price for low-value fish.

Table 5. Overall Marketing Efficiency across Channels (Shepherd Index)

| Fish Category | Channel I | Channel II | Channel III | Channel IV |
|---------------|-----------|------------|-------------|------------|
| High Value    | 2.75      | 4.25       | 5.5         | 2.2        |
| Medium Value  | 2.3       | 3.5        | 4.3         | 2.0        |
| Low Value     | 1.7       | 2.0        | 2.1         | 1.31       |

Source: Author Computation

The producer efficiency indicated in Table 6 under the Acharya & Agarwal Index shows that the increase in efficiency is directly linked with the reduction in the

length of the marketing channel used. Channel III was associated with the highest level of producer efficiency (4.5, 3.3, and 1.1) for all three types of fish, whereas Channel IV exhibited the lowest producer efficiency (1.08, 0.9, and 0.3). This variation may be attributed to the difference in net prices received from consumers compared to marketing costs and margins. In the case of Channel III, where fewer intermediary stages exist, marketing costs and margins are low, leading to higher producer efficiency. Channel II shows moderate efficiency (2.92, 2.25, and 0.9) compared to Channel I (1.58, 1.17, and 0.63), indicating that partial reduction in intermediaries improves producer returns. Across all channels, efficiency declines from high-value to low-value fish, as marketing costs form a larger share of value in low-value fish. Similar findings were reported by Aswathy et al. (2014), who analysed marine fish marketing channels in Kerala and found that marketing efficiency varied significantly across species and channels, with higher efficiency observed for high-value species such as seer fish due to strong demand and better price realization. The results confirm that shorter channels improve producer efficiency by increasing net price realization, while longer channels reduce fishermen's share.

Table 6. Marketing Efficiency from Producer (Fishermen) Perspective across Channels (Acharya and Agarwal Index)

| Fish Category | Channel I | Channel II | Channel III | Channel IV |
|---------------|-----------|------------|-------------|------------|
| High Value    | 1.58      | 2.92       | 4.5         | 1.08       |
| Medium Value  | 1.17      | 2.25       | 3.3         | 0.9        |
| Low Value     | 0.63      | 0.9        | 1.1         | 0.3        |

Source: Author Computation

#### D. Marketing Constraints Analysis

The major marketing constraints faced by stakeholders in the fish marketing system were identified in the table 7. and ranked using the Garrett ranking technique, and the results are presented in Tables. For the fishermen, the constraints are linked to problems related to pricing and participation in the market, whereas for the intermediaries, they relate to the cost and efficiency of marketing operations. The prioritization according to the mean Garrett score

helps understand the weight of each constraint and its significance for the efficiency of the entire fish marketing process.

Table 7. Fishermen's Marketing Constraints (n= 60)

| S. No | Constraint                                   | Mean score | Rank |
|-------|----------------------------------------------|------------|------|
| 1     | Price fluctuation                            | 77         | I    |
| 2     | exploitation by middlemen                    | 65.83      | III  |
| 3     | delay in payment                             | 32.83      | VI   |
| 4     | spoilage during marketing                    | 48.5       | IV   |
| 5     | lack of bargaining power                     | 67.17      | II   |
| 6     | limited access to distant/high value markets | 38.67      | V    |

Source: Author Computation

From table 8, it is evident that the major constraints confronting fishermen include price volatility (77), absence of bargaining power (67.17), and exploitation by middlemen (65.83). As a result, price negotiation is out of the hands of fishermen who find themselves having to sell their products through middlemen for reduced prices. This has the effect of lowering their participation in the consumer rupee. Other constraints which include spoilage (48.5) and difficulty in accessing distant/high value markets (38.67) also limit their participation in lucrative marketing channels. The end effect of all this on marketing efficiency is increased marketing margin as well as price spread. This results in low net prices obtained by fishermen and therefore lowers channel efficiency.

Table 8. Intermediaries' Marketing Constraints (n= 60)

| S. No | Constraint                     | Mean score | Rank |
|-------|--------------------------------|------------|------|
| 1     | spoilage/perishability of fish | 38.67      | V    |
| 2     | price fluctuation              | 72.83      | I    |
| 3     | high transportation cost       | 32.83      | VI   |
| 4     | competition among traders      | 49.83      | IV   |
| 5     | fluctuating supply of fish     | 66         | III  |
| 6     | uncertain demand in the market | 69.83      | II   |

Source: Author Computation

As per the Garrett ranking method, the key constraints for intermediaries would include price variability (72.83), uncertain market demand (69.83), and variability in fish supply (66). This reveals the inherent instability associated with the market for fish. Price variability is influenced by competition between fish

traders (49.83) and spoilage/perishability (38.67). High transportation cost (32.83) poses little constraint to the intermediaries. Price risk and volume risk are major drivers behind price variability, spoilage/perishability and competition. These constraints exert pressure on marketing margins due to price variability and volume uncertainty. This leads to low marketing margins, creating volatility in prices. As such, intermediaries become reluctant when trading with customers, causing price differences between the various marketing channels. This results in low marketing efficiency due to price variation. The general evaluation of marketing costs, profit margins, efficiency, and limitations confirms that marketing channel configuration becomes the most important factor in marine fish marketing. Marketing channels with few intermediaries showed significantly low levels of marketing costs and profit margins, which translated to narrow price difference and higher efficiency as measured by Shepherd and Acharya efficiencies. On the other hand, marketing channels with many intermediaries had higher levels of total marketing costs – in particular, transportation, handling, icing, and labor – and higher marketing margins, resulting in less net prices for fishermen. This evaluation further shows that there are variations in efficiency between different fish groups, in that higher valued fish were more efficient because they have low costs relative to their price. The prevalence of factors like price instability, bargaining weakness, and intermediation among fishermen and uncertainty in demand and supply among intermediaries further strengthens the prevailing marketing system and restricts the realization of prices. On the whole, the study reveals that any reduction in intermediary stages results in reduced marketing expenses and higher efficiencies in the system as well as by the producers, resulting in increased fishermen's earnings from each consumer rupee.

## V. CONCLUSION

The current research investigated the structure, cost, margins, efficiency, and constraining factors influencing the marketing channels for marine fishes in the Thoothukudi district of Tamil Nadu. From the study, it was observed that efficiency of marketing depends upon the number of middlemen in the channel. Marketing channels having a smaller number

of middlemen witnessed lesser marketing costs and margins, hence lesser price spread with greater efficiency under both the Shepard and Acharya indices, but higher cumulative marketing costs, particularly transport, ice expenses, handling, labour, and larger margins were incurred in the longer channels, lowering net price received by fishermen. It was also seen that efficiency differed between low and high-value fish as marketing cost constituted a bigger proportion of total sales value in the case of low-value fish. Important constraining factors that impact marketing included price variation, lack of bargaining power, dominance of middlemen, and demand and supply uncertainty. Cold chain investment through infrastructure, storage and transport services will aid in preventing losses due to spoiling, and also help in stabilizing prices. Improved bargaining power and access to markets can be achieved through the improvement of fishermen cooperatives and producer associations. Information on the markets can also be improved in order to make informed decisions.

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