



# **What Drives Profit in Coastal Fisheries Enterprises? Processing Technology, Packaging and Branding: Evidence from a Coastal District of Tamil Nadu**

**Dr. K. Suganthi<sup>1</sup>**

Principal, Vivekananda College of Arts and Science for Women, Sirkali (Affiliated to Annamalai University), Tamil Nadu, India<sup>1</sup>

**Mrs. P. Nisha<sup>2</sup>**

Assistant Professor of Business Administration, Vivekananda College of Arts and Science for Women, Sirkali (Affiliated to Annamalai University), Tamil Nadu, India<sup>2</sup>

**J. Rifka Nasreen<sup>3</sup>, G. Divya<sup>4</sup>, T. Gayathiri<sup>5</sup>**

Students of Business Administration, Vivekananda College of Arts and Science for Women, Sirkali (Affiliated to Annamalai University), Tamil Nadu, India<sup>3,4,5</sup>

**Abstract-** Value addition is widely promoted as a route to higher incomes in the fisheries sector, but little primary evidence exists for the coastal enterprises of Mayiladuthurai District. This study examines the effect of seven value-addition dimensions (product quality, product innovation, packaging, branding, shelf life, processing technology and product variety) on enterprise profitability. Primary data were collected through a structured five-point Likert questionnaire from 120 respondents (24 each of enterprise owners, processing unit owners, traders/wholesalers, vendors/retailers and fishermen engaged in value addition) in nine coastal villages. Reliability was acceptable (Cronbach's alpha 0.751 for value addition and 0.724 for profitability). Pearson correlation, multiple regression and a regression-based path model were applied. Overall value addition correlated strongly with profitability ( $r = 0.700$ ,  $p < 0.001$ ); the seven dimensions jointly explained 52.9% of the variance in profitability ( $F = 18.004$ ,  $p < 0.001$ ), and the standardised path from value addition to profitability was 0.718. Processing technology, packaging, branding and product variety were significant individual predictors, with processing technology the strongest. The findings suggest that investment in processing technology, packaging and branding should be prioritised in enterprise strategy and support schemes.



**Keywords-** value addition; profitability; fisheries enterprises; processing technology; Mayiladuthurai

## **I. Introduction**

Fisheries contribute to food security, rural employment and trade, yet a large share of the catch in India is still sold fresh through traditional channels, where prices are low and post-harvest losses are high. Value addition, which transforms raw fish into products of higher worth through cleaning, grading, processing, preservation, packaging and branding, is regarded as one of the most practical ways of raising incomes and extending shelf life. Mayiladuthurai District, with its coastal villages in Sirkazhi and Tharangambadi taluks, has a sizeable community of fishers, processors, traders and vendors, but the profit effect of value-addition practices among these enterprises has not been examined empirically.

This paper addresses that gap. Its objective is to analyse the impact of value addition on the profitability of fisheries enterprises in Mayiladuthurai District, and to identify which dimensions of value addition contribute most to profitability.

## **II. Review of Literature and Hypothesis**

Okelola et al. (2026) reported that smoking, drying, packaging and proper preservation significantly raised the market value and income of fish traders in Southwest Nigeria. Rashid (2026) found that value-added fish products earned higher incomes than fresh fish in Mkinga District, Tanzania, although adoption stayed low because of limited equipment, high investment cost and poor market access. Kyule et al. (2025) showed that processing, packaging and related practices improve product quality, extend shelf life and increase market value in Kenya. From a marketing perspective, Anthon et al. (2024) observed that innovative and customer-oriented marketing strengthened the financial performance of small-scale fishermen, and Liu et al. (2024) linked better coordination along the value chain with improved quality and economic returns in Taiwan's tuna fishery.

Taken together, the literature points to a positive link between value addition and enterprise income, but mostly through qualitative or single-activity evidence from other regions. On this basis the following hypothesis was framed (Figure 1):

- **H0:** Value addition has no significant effect on the profitability of fisheries enterprises in Mayiladuthurai District.
- **H1:** Value addition has a significant effect on the profitability of fisheries enterprises in Mayiladuthurai District.

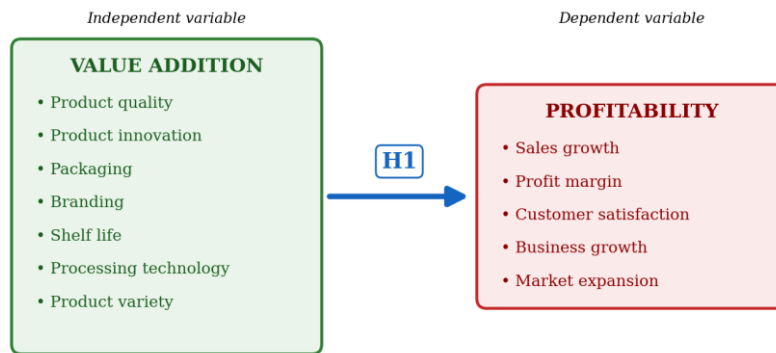


Figure 1. Conceptual framework of the study

### III. Research Methodology

A descriptive, cross-sectional survey design was used. The population (fisheries enterprises engaged in processing, marketing or value-added fish products in the district) has no consolidated registry and was treated as unknown. Using Cochran's formula for an infinite population (95% confidence,  $p = q = 0.5$ , 9% margin of error), the sample size was 118.6, rounded up to 120. Respondents were selected by convenience sampling from nine coastal villages of Sirkazhi and Tharangambadi taluks, with 24 respondents in each of five categories: enterprise owners, processing unit owners, traders/wholesalers, vendors/retailers, and fishermen involved in value addition.



Primary data were gathered with a structured questionnaire on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Value addition was measured by 21 items covering seven dimensions (product quality, product innovation, packaging, branding, shelf life, processing technology and product variety), and profitability by 15 items on sales growth, profit margin, customer satisfaction, business growth and market expansion. Cronbach's alpha was 0.751 for the value-addition scale and 0.724 for the profitability scale, both above the 0.70 benchmark. Descriptive statistics, Pearson correlation and multiple regression were used, with profitability as the dependent variable and the seven dimensions as predictors. A regression-based path (observed-variable structural) model was also estimated, taking overall value addition as the independent variable. Significance was tested at the 5% level.

#### IV. Results and Discussion

##### 1. Descriptive statistics and correlation

Table 1 shows that respondents rated all seven dimensions above the scale midpoint, with product innovation (mean 3.79) and branding (3.75) highest and product variety (3.59) lowest. Every dimension correlated positively and significantly with profitability ( $p < 0.001$ ). Processing technology showed the strongest association ( $r = 0.555$ ), followed by branding (0.476) and packaging (0.467). Overall value addition and profitability were strongly correlated ( $r = 0.700$ ,  $p < 0.001$ ), so enterprises that practise value addition more extensively report higher profitability.

Table 1. Mean score of value-addition dimensions and correlation with profitability  
(N = 120)

| Dimension              | Mean | Std. deviation | Pearson r with profitability |
|------------------------|------|----------------|------------------------------|
| Product innovation     | 3.79 | 0.77           | 0.363*                       |
| Branding               | 3.75 | 0.78           | 0.476*                       |
| Processing technology  | 3.72 | 0.80           | 0.555*                       |
| Product quality        | 3.71 | 0.75           | 0.390*                       |
| Shelf life             | 3.67 | 0.76           | 0.405*                       |
| Packaging              | 3.67 | 0.78           | 0.467*                       |
| Product variety        | 3.59 | 0.79           | 0.437*                       |
| Overall value addition | —    | —              | 0.700*                       |



Source: Primary data. \*Significant at  $p < 0.001$ .

## 2. Multiple regression

The regression model was statistically significant ( $R = 0.728$ ,  $R^2 = 0.529$ , adjusted  $R^2 = 0.500$ ;  $F(7, 112) = 18.004$ ,  $p < 0.001$ ), so the seven dimensions together explain 52.9% of the variance in profitability. Table 2 reports the coefficients. Processing technology ( $\beta = 0.338$ ,  $p < 0.001$ ), packaging ( $\beta = 0.203$ ,  $p = 0.009$ ), branding ( $\beta = 0.189$ ,  $p = 0.012$ ) and product variety ( $\beta = 0.157$ ,  $p = 0.034$ ) each make a significant unique contribution. Product quality is marginally short of significance ( $p = 0.087$ ), while product innovation and shelf life are not significant once the other dimensions are controlled, even though both correlate with profitability on their own. This is consistent with the dimensions being related to one another, so that their separate effects are partly shared.

Table 2. Multiple regression of profitability on value-addition dimensions

| Predictor             | B     | Std. $\beta$ | t     | p-value |
|-----------------------|-------|--------------|-------|---------|
| (Constant)            | 0.772 | –            | 2.836 | 0.005   |
| Product quality       | 0.094 | 0.128        | 1.727 | 0.087   |
| Product innovation    | 0.061 | 0.086        | 1.180 | 0.240   |
| Packaging             | 0.143 | 0.203        | 2.677 | 0.009   |
| Branding              | 0.133 | 0.189        | 2.554 | 0.012   |
| Shelf life            | 0.013 | 0.018        | 0.233 | 0.816   |
| Processing technology | 0.232 | 0.338        | 4.670 | <0.001  |
| Product variety       | 0.109 | 0.157        | 2.148 | 0.034   |

Dependent variable: profitability.  $R^2 = 0.529$ ; adjusted  $R^2 = 0.500$ ;  $F(7, 112) = 18.004$ ,  $p < 0.001$ .

## 3. Path model

In the structural (path) model, the direct path from overall value addition to profitability was strong and significant (standardised  $\beta = 0.718$ ,  $t = 10.898$ ,  $p < 0.001$ ); the model explained 50.6% of the variance in profitability (adjusted  $R^2 = 0.494$ ,  $F = 39.665$ ,  $p < 0.001$ ). Both the regression and the path results lead to the same decision: the null

hypothesis is rejected and H1 is accepted. Value addition has a significant positive effect on the profitability of fisheries enterprises in the district (Figure 2).

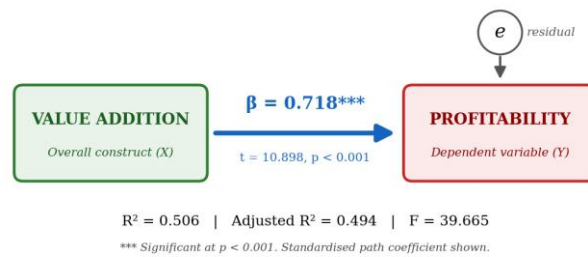


Figure 2. Path model of value addition and profitability

## V. Discussion

The positive effect agrees with Okelola et al. (2026), Rashid (2026) and Kyule et al. (2025), who all link value-added activity to higher fish income and market value. The dominance of processing technology suggests that gains come mainly from what can be done to the fish (freezing, cold storage, hygienic handling) rather than from product design alone, which also fits the supply-side constraints that Rashid (2026) reports. The significance of packaging and branding supports the marketing argument of Anthon et al. (2024) that presentation and customer orientation lift financial performance, and the effect of product variety indicates that a wider range of products helps reach more buyers. The ranking of product innovation as the highest-rated dimension, but not a significant predictor, shows that respondents' perceived emphasis and actual profit impact are not the same thing.

## VI. Conclusion and Implications

Value addition significantly improves the profitability of fisheries enterprises in Mayiladuthurai District, with processing technology, packaging, branding and product



variety as the active drivers. For entrepreneurs, this means directing limited capital first to processing and cold-storage facilities and to better packaging and branding. For policymakers and support agencies, subsidies, training and common processing facilities that target these dimensions are likely to give the highest return. Respondents themselves most often recommended training in value-addition techniques (70.8%) and government financial assistance (65.8%).

The study has limitations: it covers one district, uses convenience sampling and a cross-sectional design, and relies on self-reported perceptions of profitability rather than audited accounts. Future work could use probability sampling, financial records and multi-district comparison, and could test how challenges such as finance and infrastructure shape the value-addition–profit link.

## References

1. Anthon, E., Mariyana, S., Nurjannati, U. T., & Triawan, P. A. (2024). Strengthening the economy of small-scale fishermen: The role of entrepreneurial marketing processes in enhancing financial performance to reduce poverty. *Russian Journal of Agricultural and Socio-Economic Sciences*, 155(11).
2. Kyule, D., Munguti, J., Muthoka, M., Opiyo, M., & Abwao, J. (2025). A review of fish value-added products in Kenya: Current status, challenges and areas for improvement. *Sustainable Aquatic Research*, 4(1), 116–142.
3. Liu, W. H., Lin, C. C., Lee, C. F., Tsai, C. S., & Yang, T. Y. (2024). Toward sustainable development of tuna longline fishery in Taiwan: Value chain analysis. *Marine Policy*, 161, 106010.
4. Okelola, O. E., Alufohai, G. O., Babalola, D. O., Balogun, O. L., & Ayantoyinbo, A. A. (2026). Value addition and profitability in fish marketing: Evidence from Southwest, Nigeria. *African Journal of Agriculture and Food Science*, 9(1), 31–48.
5. Rashid, A. H. (2026). Fish value addition and livelihood outcomes of fishing communities: Evidence from Mkinga District, Tanzania. *Journal of Economics Business Industry*, 3(3), 179–187.