International Journal of Modern Developments in Engineering and Science
Volume 4, Issue 3, March 2025
https://www.ijmdes.com | ISSN (Online): 2583-3138

Challenges Faced in Managing Supply Chain Practices in Sea Food Exports

N. Chandrakala[1], K. Harish[2*]
[1]Associate Professor, Department of Commerce with International Business, Dr. N.G.P. Arts and Science College, Coimbatore, India
[2]Student, Department of Commerce with International Business, Dr. N.G.P. Arts and Science College, Coimbatore, India

***Abstract*: The seafood export industry faces numerous challenges in managing supply chain practices due to the perishable nature of the products, regulatory complexities, and global market demands. Maintaining product quality and freshness throughout the supply chain requires efficient cold chain logistics, which can be disrupted by inadequate infrastructure, power outages, or delays in transportation. Compliance with international food safety standards, such as HACCP (Hazard Analysis and Critical Control Points) and ISO certifications, adds another layer of complexity, requiring businesses to invest in proper handling, storage, and documentation procedures. Additionally, environmental concerns such as overfishing, marine pollution, and climate change pose significant risks to seafood availability and sustainability. Exporters also face trade barriers, fluctuating currency rates, and geopolitical tensions, which can impact market access and profitability. Balancing these operational, environmental, and regulatory challenges demands strategic planning, investment in technology, and collaboration with stakeholders to ensure smooth and sustainable supply chain practices in the seafood export sector.**

***Keywords*: seafood export, supply chain management, cold chain logistics, food safety standards, regulatory compliance, environmental challenges, trade barriers, currency fluctuations, and sustainability.**

1. Introduction

The seafood export industry plays a vital role in global trade, supplying a significant portion of the world's protein demand. Managing supply chain practices in this sector is inherently complex due to the perishable nature of seafood, stringent international quality standards, and the need for seamless coordination across multiple stakeholders. From sourcing raw materials to delivering finished products to global markets, exporters must navigate challenges such as maintaining cold chain integrity, ensuring traceability, and complying with evolving food safety regulations. Moreover, environmental factors like climate change and overfishing further complicate supply chain stability, while logistical issues such as delays, inadequate infrastructure, and trade restrictions can disrupt the timely delivery of products. Understanding these challenges is crucial for enhancing supply chain efficiency, minimizing losses, and ensuring the sustainability of seafood exports in an increasingly competitive global marketplace.

2. Objectives of the Study

- To examine the primary challenges faced in managing seafood export supply chains, including sourcing, processing, storage, and logistics.
- To explore the effectiveness of transportation, storage, and cold chain systems in preserving seafood freshness.
- To explore the role of technology and innovation in improving supply chain management for seafood exports.
- To recommend effective strategies to mitigate supply chain challenges and enhance seafood export performance.

3. Statement of the Problem

The seafood export industry faces numerous supply chain challenges, including logistical complexities, perishability, regulatory compliance, and sustainability concerns. Effective supply chain management is crucial for maintaining quality, reducing waste, ensuring timely delivery, and complying with international standards. However, factors such as inadequate cold chain infrastructure, high transportation costs, fluctuating market demand, and stringent health regulations create significant obstacles. This study aims to identify and analyze these challenges and suggest potential solutions for improving seafood export supply chain management.

4. Review of Literature

1. Arthon Prompatanapak a, Kannapon Lopetcharat (2020), the article “Managing changes and risk in seafood supply chain: A case study from Thailand” on Thailand's seafood supply chain has experienced significant disruptions due to environmental challenges, regulatory changes, and resource depletion. The outbreak of Early Mortality Syndrome (EMS) in shrimp farming severely impacted production, while stricter food safety laws and evolving regulations increased compliance costs, forcing several small and medium processors to shut down. Additionally, the depletion of natural resources has strained seafood availability, further complicating supply chain stability. These challenges have led to role shifts among key stakeholders such as farmers, processors, and brokers, who have had to adapt to changing market conditions and operational demands. As the industry navigates these

*Corresponding author: harishhrs006@gmail.com

complexities, effective risk management strategies and innovative practices are crucial to ensuring long-term stability and competitiveness in global markets.

2. Brian Sterling, Martin Gooch, Benjamin Dent, Nicole Marenick, Alexander Miller, Gilbert Sylvia (2015), the article "Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective" Research on seafood traceability highlights its critical role in improving business performance, reducing waste, and enhancing consumer trust across global seafood value chains. A study assessing 48 seafood businesses across nine value chains found that traceability is most valued by companies actively engaging in collaborative practices with suppliers and customers. Structured and semi-structured interviews with over 80 industry participants emphasized that businesses adopting traceability systems experience improved operational efficiency and greater consumer confidence. Additionally, consumer surveys conducted across five nations identified key purchasing factors related to traceability, leading to the development of a "Discrete Choice Simulator" to analyze consumer preferences. The findings underscore that effective traceability systems not only improve supply chain transparency but also provide valuable insights for businesses, governments, and NGOs seeking to enhance seafood sustainability and market competitiveness.
3. C.R. Hopkins, S.I. Roberts, A.J. Caveen, C. Graham, N.M. Burns (2024), the article "Improved traceability in seafood supply chains is achievable by minimising vulnerable nodes in processing and distribution networks" Research on seafood traceability highlights the need to minimize vulnerable nodes in processing and distribution networks to improve supply chain transparency. A study of UK seafood supply chains — including Dover sole, North-East Atlantic mackerel, and brown crab and lobster — reveals that while shorter supply chains achieve better traceability, weak points in processing and distribution can undermine efforts. Advances in monitoring technologies and regulatory changes have improved traceability and reduced IUU fishing risks. Although UK seafood supply chains meet regulatory standards, stakeholders are increasingly pursuing best practices to enhance consumer trust, recognizing that traceability alone does not guarantee sustainability.

5. Data Analysis and Interpretation

Interpretation:

From the table 1, 65% of the respondents are male, while 35% are female. 33% of the respondents are in the 31-40 years age group, making it the largest group. 27% of the respondents are in the 20-30 years age group, 23% of the respondents are aged 51 years and above, while 17% fall into the 41-50 years age group. 25% of respondents earn between 1-2 lakhs, while 23% earn 4 lakhs and above. 22% of respondents have an income between 2-3 lakhs, while 17% earn between 3-4 lakhs. 13% of respondents earn below 1 lakh. 22% of respondents have a diploma, while 22% hold a postgraduate (PG) qualification. 18% of respondents have completed school-level education, and 17% fall under other educational qualifications. 13% of respondents are undergraduate (UG) degree holders, while 8% of respondents are illiterate. 32% of respondents have less than 1 year of experience, while 28% have 1-3 years of experience. 23% of respondents have more than 5 years of experience, and 17% have 3-5 years of experience.

Table 1
Percentage analysis on demographic variables

Gender of the respondent	No of Respondents	Percentage
Male	78	65
Female	42	35
Total	120	100
Age		
20-30 years	32	27
31-40 years	40	33
41-50 years	20	17
51 years and above	28	23
Total	120	100
Income		
Below 1 lakh	16	13
1-2 lakhs	30	25
2-3 lakhs	26	22
3-4 lakhs	20	17
4 lakhs and above	28	23
Total	120	100
Educational qualification of respondent		
Illiterate	10	8
School level	22	18
Diploma	26	22
UG	16	13
PG	26	22
Others	20	17
Total	120	100

Table 2
Product export most

Product export most	No of Respondents	Percentage
Octopus	26	22
Fish	20	17
Crab	36	30
Cuttle fish	10	8
Squid	10	8
Shrimps	18	15
Total	120	100

Interpretation:

From the table 2, 30% of respondents export crab, making it the most exported product. 22% of respondents export octopus, while 17% export fish. 15% of respondents export shrimps, and 8% export both cuttlefish and squid.

Table 3
Export the product

Export the product	No of Respondents	Percentage
Raw	66	55
Block frozen	18	15
Bulk packs	36	30
Total	120	100

Interpretation:

From the table 3, 55% of respondents export raw products, making it the most common export type. 30% of respondents export bulk packs, while 15% export block frozen products.

Table 4
The major supply chain challenges they faced

Challenges	No.of Respondents	Percentage
Sourcing and availability of raw materials	25	21
High transportation costs	62	51
Cold chain management issues	34	28
Total	120	100

Interpretation:

From the table 4, 68% of respondents face challenges with high transportation charges, while 38% face challenges with Cold chain management issues and 21% of respondents face challenges with sourcing and availability of raw materials.

Table 5
The key challenges faced during seafood procurement

Challenges	No.of Respondents	Percentage
Inconsistent supply	46	38
Quality issues	26	22
Supplier reliability	35	29
Others	13	11
Total	120	100

Interpretation:

From the table 5, 38% of respondents face challenges with inconsistent supply during seafood procurement, while 29% struggle with supplier reliability. 22% of respondents encounter quality issues, and 11% face other challenges.

Table 6
Frequency of facing issues with the quality of sourced seafood

Opinion	No.of Respondents	Percentage
Regularly	44	37
Occasionally	26	22
Rarely	38	32
Never	12	10
Total	120	100

Interpretation:

From the table 6, 37% of respondents face issues with the quality of sourced seafood regularly, while 32% face such issues rarely. 22% of respondents encounter quality issues occasionally, and 10% never face quality issues.

Table 7
Main challenges in seafood storage

Challenges	No.of Respondents	Percentage
In adequate cold storage facilities	46	38
High maintenance costs	36	30
Power supply issues	38	32
Total	120	100

Interpretation:

From the table 7, 38% of respondents face challenges with inadequate cold storage facilities, while 32% struggle with power supply issues. 30% of respondents encounter high maintenance costs in seafood storage.

Table 8
Major issues related to warehouse management

Issues	No.of Respondents	Percentage
Physical Inventory	39	33
Inventory Valuation	41	34
Stock Status Report	28	23
Date Last Sold	12	10
Total	120	100

Interpretation:

From the table 8, 34% of respondents face issues with inventory valuation, while 33% encounter challenges with physical inventory. 23% of respondents struggle with stock status reports, and 10% face issues related to the date last sold.

6. Conclusion

The project entitled “Challenges faced in managing supply chain practices in sea foods exports” was carried out with sample size of 120. The statistical tools used for the study is Percentage analysis, Chi-square, and ANOVA. Most respondents export raw products, making it the most common export type and majority and they s face challenges with high transportation charges. Majority of respondents recommend investing in cold chain technology as a measure to improve supply chain practices in the seafood export industry

Managing supply chain practices in seafood exports requires a strategic approach that balances quality control, compliance, and cost-efficiency. Strengthening infrastructure, improving traceability, and adopting sustainable practices are essential to overcoming challenges. By leveraging technology and streamlining logistics, exporters can enhance operational efficiency, meet international standards, and remain competitive in the global seafood market.

References

[1] Brian Sterling et al., (2015), Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective. *Comprehensive Reviews in Food Science and Food Safety,* 14(3).

[2] Arthon Prompatanapak et al (2020), Managing changes and risk in seafood supply chain: A case study from Thailand. *Aquaculture,* vol. 525.

[3] C.R. Hopkins et al., (2024), Improved traceability in seafood supply chains is achievable by minimising vulnerable nodes in processing and distribution networks. *Marine Policy,* vol. 159.