JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

SUPPLY CHAIN CHALLENGES OF MARINE FOOD EXPORTERS IN TUTICORIN

Dr.S.Mohanraj,

Head Department Commerce with International Business, Dr.N.G.P. Arts and Science College, Coimbatore

Joy Sandriya Vaiz. S,

B.Com International Business, Dr.N.G.P. Arts and Science College, Coimbatore

ABSTRACT:

The marine food export industry in Tuticorin plays a crucial role in India's seafood trade but faces several supply chain challenges that hinder efficiency and competitiveness. The perishable nature of seafood, transportation delays, and heavy reliance on international markets further complicate the supply chain. This study shows the challenges faced by the marine food exporters, and what are the reasons behind it, and how they overcome it. The survey studied and shows that focusing in 43 manufacturing exporters and explaining about the problems and the challenges faced by them. Strengthening these areas will not only enhance supply chain resilience but also ensure the long-term growth and sustainability of the marine food export industry in Tuticorin.

KEYWORDS: Marine food exporters, challenges, supply chain, marine products

INTRODUCTION:

Tuticorin is a major marine food export hub in India, significantly contributing to the seafood trade. Its strategic coastal location and developed fishing harbors support various stages of the export process, including harvesting, processing, and transportation, which require efficient management to ensure product quality. However, the industry faces several challenges. The perishable nature of seafood necessitates a reliable cold chain to prevent spoilage. Exporters must also meet stringent international quality standards set by bodies like the EU and FDA, which require significant investments that can burden smaller exporters. This study analyzes the key supply chain challenges in Tuticorin's marine food export sector, aiming to identify factors contributing to inefficiencies. By addressing these challenges, stakeholders can explore solutions like advanced technologies and improved infrastructure, ultimately enhancing the global competitiveness and sustainability of the industry. Its strategic coastal location and developed fishing harbors support various stages of the export

process, including harvesting, processing, and transportation, which require efficient management to ensure product quality.

OBJECTIVES :

1. This study shows the challenges of marine food exporters of the Tuticorin district.
2. This study identifies the bottle neck challenges of the supply chain, and identifies the market fluctuations and the competitions.
3. To find out the problems affecting supply chain and proving better solutions to it.

REVIEW OF LITERATURE :

1. **Lily Z. Zhao (2018) : "**Octopus is an important food and economic resource in Kenya and Tanzania, with growing international demand. Fisheries managers are considering Marine Stewardship Council certification, but challenges remain. Key issues include product scarcity, informal trade of immature octopus, and lack of funding for fisheries management. Additionally, octopus imports from Mozambique obscure declining local catch levels. Understanding these challenges will help assess the feasibility of certification".

2. **S. Majumdar study (2024) : "**Sustainable development requires a collaborative approach to tackle issues like climate action, resource optimization, and raw material management. The seafood supply chain faces challenges that threaten its resilience, food security, and ecology. This study reviews 20 years of research on packaging materials, shelf-life extension, digital innovations, and sustainable fishing practices in seafood supply chains. It aims to identify key challenges and propose solutions to improve sustainability in both modern and traditional seafood packaging, while evaluating management practices and critical factors"**.**

3. **M. Lucarini (2022) :** "This report examines the potential of using marine food chain by-products, such as fish processing waste, to extract valuable nutrients like omega-3 fatty acids (EPA, DHA) and α-tocopherol. This approach promotes sustainability by reducing food waste and creating high-value food products and nutraceuticals. As demand for omega-3 increases, developing green extraction methods for these compounds from fish by-products could support a circular economy, turning waste into valuable ingredients and enhancing fish production sustainability".
4. **S. Liu (2022) : "**This research note explores the role of renewable energy in the food supply chain and sustainable marine fisheries within the context of Sustainable Development Goals (SDGs). It highlights how the share of renewable energy, as indicated by SDG 7.2.1, can support the measurement of SDG Indicators 12.3.1 and 14.7.1. Renewable energy is crucial for reducing onboard costs related to harvesting, processing, and preserving fish, and can also help estimate food waste when direct data is

unavailable. The note advocates for more interdisciplinary studies on SDG interactions and calls for further empirical research. It stresses the need for comprehensive policies that address country-specific disparities and recommends enhancing statistical capabilities to improve data analysis. The aim is to stimulate scientific thought and offer policy suggestions, while leaving room for future research based on empirical evidence".

RESEARCH METHODOLOGY:

The survey studied 29 marine exporters of the manufacturing unit in Tuticorin district. This helps us to understand that they face a lot of challenges during the supply chain process and how they overcome it.

Type of Research: Descriptive research

Study Design: Stratified sampling

Sampling Area: Tuticorin manufacturing exporters

Study Area: Tuticorin

Population Size : 34

Sample Size: 29 (**Source** : MPEDA)

The manufacturing exporters of Tuticorin show how and what are the challenges they face as an exporter. This study shows the problems and crises they face during the supply chain management as an exporter.

ANALYSIS & INTERPRETATION :

DESCRIPTIVE STATISTICS ANALYSIS

S.NO	EXPERIENCE	FREQUENCY	PERCENT
1.	Less than a year	1	3.4
2.	1-5	7	24.1
3.	6-10	9	31.0
4.	More than 10 years	12	41.4
S.NO	**COUNTRIES EXPORTED**	**FREQUENCY**	**PERCENT**
1.	North America	6	20.7
2.	Europe	2	6.9
3.	Asia	21	72.4
S.NO	**EMPLOYEE STRENGTH**	**FREQUENCY**	**PERCENT**

1.	1-10	1	3.4
2.	11-20	6	20.7
3.	21-30	6	20.7
4.	31-40	9	31.0
5.	more than 40	7	24.1
	Total	**29**	**100.0**

Source: Primary Data

INTERPRETATION:

The data indicates that the industry is dominated by experienced professionals, with 72.4% having over 6 years of experience. Most exports are focused on Asia (72.4%), while North America (20.7%) and Europe (6.9%) have a smaller share. In terms of workforce, the majority of companies have more than 30 employees (55.1%), showing that established businesses prevail over smaller firms. Overall, the sector is characterized by experienced professionals, a strong Asian market presence, and medium-to-large-sized enterprises.

CHI SQUARE

TABLE SHOWING ASSOCIATION BETWEEN WAREHOUSES IN COMPANY AND FREQUENCY OF EXPORT

HYPOTHESIS:

H_0: There is no significant association between the warehouses in company and frequency of export.

H_1: There is significant association between the warehouses in company and frequency of export.

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	6.077[a]	4	.193
Likelihood Ratio	7.617	4	.107
Linear-by-Linear Association	.555	1	.456
N of Valid Cases	**29**		

Source: Primary Data

INTERPRETATION:

The Chi-Square test (p = .193) indicates no significant relationship between the variables. Likewise, the Likelihood Ratio test (p = .107) and the Linear-by-Linear Association test (p = .456) show no meaningful association. With 29 valid cases, the results suggest that any observed variations are likely due to chance.

TABLE SHOWING ASSOCIATION BETWEEN WAREHOUSES IN COMPANY AND CHALLENGE FACED IN SOURCING RAW MATERIALS

HYPOTHESIS:

H_0: There is no significant association between warehouses in company and challenge faced in sourcing of raw materials.

H_1: There is a significant association between warehouses in company and challenge faced in sourcing raw materials

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	9.363[a]	8	.313
Likelihood Ratio	10.690	8	.220
Linear-by-Linear Association	.093	1	.761
N of Valid Cases	**29**		

Source: Primary Data

INTERPRETATION :

The Pearson Chi-Square test (p = .313) shows no significant association between the variables. Likewise, the Likelihood Ratio test (p = .220) and the Linear-by-Linear Association test (p = .761) indicate no meaningful relationship. With 29 valid cases, the findings suggest that any observed differences are likely due to chance.

ANOVA

TABLE SHOWING YEARS OF EXPERIENCE AND EMPLOYEE STRENGTH

HYPOTHESIS:

H_0. There is no difference between years of experience and employee strength.

H_1: There is a difference between years of experience and employee strength.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	2.388	3	.796	.540	.659
Within Groups	36.853	25	1.474		
Total	39.241	28			

Source: Primary Data

INTERPRETATION :

The ANOVA results show no significant differences between the groups (F = 0.540, p = 0.659). Since the p-value exceeds 0.05, the null hypothesis is not rejected, indicating that the group means do not differ significantly.

TABLE SHOWING FREQUENCY OF EXPORT AND CHALLENGE FACED IN LOGISTICS

HYPOTHESIS:

H_0. There is no difference between frequency of export and challenge faced in logistics.

H_1: There is a difference between frequency of export and challenge faced in logistics.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.024	2	.012	**.019**	**.982**
Within Groups	16.941	26	.652		
Total	16.966	28			

Source: Primary Data

INTERPRETATION :

Since the p-value is very high (0.982), we fail to reject the null hypothesis. This suggests that there is no meaningful difference between the groups' means, and any observed differences are likely due to random variation rather than an actual effect.

FINDINGS:

DESCRIPTIVE STATISTICS ANALYSIS:

- **Experience**: The majority of companies (72.4%) have more than six years of experience, with 41.4% surpassing 10 years, reflecting strong industry expertise.
- **Export Destinations**: Asia dominates as the main export market (72.4%), while North America (20.7%) and Europe (6.9%) have comparatively lower trade activity.
- **Employee Strength**: A significant portion of businesses (75.9%) employee over 30 workers, indicating a medium to large-scale workforce.

CHI SQUARE:

- **Warehouses & Export Frequency**: There is no significant link between the number of warehouses and export frequency (p = 0.193). The variations seem random, and a larger sample could provide more precise insights.
- **Logistics Challenges & Export Frequency**: High transportation costs are the most prevalent challenge, particularly for weekly exporters. Cold chain issues mainly affect weekly and monthly shipments, while trade restrictions and supply chain disruptions are minimal.

ANOVA :

- **Experience & Employee Strength**: ANOVA (F = 0.928, p = 0.464) shows no significant difference in experience levels among groups, suggesting variations are random. A larger sample could provide clearer insights.

- **Export Frequency & Logistics Challenges**: ANOVA (F = 0.534, p = 0.663) indicates no significant variation in export frequency across groups, implying the differences are likely due to chance rather than specific trends.

SUGGESTIONS

- Utilize government incentives and free trade agreements to simplify market entry. Strengthen e-commerce strategies to attract buyers from new markets.
- Offer incentives, career development opportunities, and flexible policies to retain employees
- Invest in smart inventory management and strategically position warehouses near export hubs.
- Implement Just-in-Time (JIT) logistics and AI-driven solutions to cut costs and improve efficiency.
- Advocate for better roads, ports, and logistics facilities through industry partnerships and government support.

CONCLUSION :

From this research the findings reveal key factors impacting business operations, export performance, and logistics challenges. Most companies have extensive industry experience and a sizable workforce, with Asia being the primary export market. However, no significant relationship was found between warehouse capacity, export frequency, and logistics issues, suggesting these variations occur randomly.

To improve efficiency and growth, businesses should focus on expanding into new markets, enhancing workforce skills, optimizing supply chains, and forming strategic partnerships. Addressing sourcing and logistical challenges through better infrastructure, diversified suppliers, and cost-effective strategies will strengthen export stability. By implementing these strategic improvements, companies can boost global competitiveness, enhance operational efficiency, and achieve sustainable success in international trade.