



# A Study on Export Freight Forwarding Services and Challenges in Multi-modal Transportation

**Dr. Anitha kumari**

School of Management Studies,  
Vels Institute of Science,

Technology and Advanced Studies (VISTAS)  
Pallavaram, Chennai, India

**SADHA .S**

School of Management Studies,  
Vels Institute of Science,

Technology and Advanced Studies (VISTAS)  
Pallavaram, Chennai, India

## How to Cite this Article:

.S, S. (2026). A Study on Export Freight Forwarding Services and Challenges in Multi-modal Transportation. International Journal of Creative and Open Research in Engineering and Management, 2(5).

<https://doi.org/10.55041/ijcope.v2i5.471>

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## ABSTRACT

In this study, the author examined export freight forwarding services with a focus on the challenges associated with multi-modal transportation operations as export freight forwards play an increasingly critical role as the intermediary in managing transportation of products, documentation, customs clearance and coordinating various parties involved in moving goods internationally due to the growing volume of global trade; and although multi-modal transportation allows the shipment of goods via four different transportation formats —land, rail, sea, and air — combined under one contract, it creates many operational challenges. A descriptive research design was used in the data collection process through the distribution of structured questionnaires to 47 individuals employed within the logistics profession, and applied various statistical methods in the analysis of the collected data (e.g., percentage analysis, descriptive statistics, analysis of variance (ANOVA), the chi-square method, and Pearson correlation analysis). An examination of correlation among operationally-related trends revealed a significant positive correlation between infrastructure constraints and high transportation costs ( $r = 0.614$ ). The results of the research indicate that freight forwarding services contribute to improved export efficiency (57.4%), but that multiple significant challenges related

to ensuring the timely delivery of exports adversely affect export operations (for example, lack of customs clearance facilities, deficient infrastructure, lack of technology integration, and intermodal coordination). Finally, recommendations to enhance coordination, achieve digital integration of logistics, comply with regulations and mitigate are provided in the conclusion of the research study.



## **INTRODUCTION:**

invisible source of power to move goods internationally from their source to their destination (i.e, help get products there safely, timely and at a reasonable cost).

Export freight forwarding companies are third parties that help organise logistics to transport products between countries. Their responsibilities involve far more than simply moving products; they are also responsible for working with exporters, transportation companies (shipping lines, airlines), customs agencies, and transportation providers (e.g., trucking companies) as well as completing the documentation, customs clearances, warehousing and ensuring that products are insured. Without freight forwarders' expertise, navigating the complex world of international shipping could be nearly impossible, particularly for small-medium sized businesses.

As more manufacturers are utilising multi-modal transportation (the act of moving goods using multiple modes of transport [road, rail, sea and air] using one document), the demand for freight forwarders is expected to continue to grow exponentially. International trade forms the backbone of modern economic growth and development, largely due to the ease and in our increasingly globalized society, global trade has become crucial in fuelling economic growth and development of countries. Many nations rely heavily on products travelling across the globe through a seamless and effective process and freight forwarding services are what drive international trade by providing an Cost optimisation, transit time minimisation and improved supply chain efficiency are achieved through multi-modal transportation; however, due to the complexities involved with each transport mode's respective regulations, documentation requirements and operational constraints, delays on one leg of a transport can carry over to severely disrupt other legs of the supply chain.

Technological advances – specifically digital platforms, real-time tracking and automated documentation – have greatly improved transparency and efficiency in the freight forwarding industry, but inadequate infrastructure in developing parts of the world is still a barrier to seamless movement of cargo. The purpose of this paper is to investigate these issues in detail and evaluate the challenges freight forwarders face in coordinating effective multi-modal export operations.

## **OBJECTIVES OF THE STUDY:**

### **PRIMARY OBJECTIVE**

- The purpose of the research is to analyse and evaluate the efficiency of the freight forwarding process as a part of logistics operations..

### **SECONDARY OBJECTIVES**

- To examine the range of end to end processes involved with freight forwarding which include documentation, customs clearance and transportation.
- To identify any bottlenecks, delays and inefficiencies present within the existing freight operation and processes.
- To examine how technology and digital solutions can assist with improved operational efficiency.
- To evaluate the cost components associated with freight forwarding and their overall impact to the performance of a business.
- To assess the overall level of coordination between shippers, carriers and customs authorities.
- To establish and report on service quality and customer satisfaction measurements within freight forwarding operations.
- To compare the operational practices of the research subject with those of industry leaders such as DHL, Fed Ex etc..



## RESEARCH GAP:

While there is a lot of literature on logistics and supply chain management, there is still a lack of knowledge about the real-life problems that arise in the export freight forwarding sector when using multimodal transport systems. Most research has looked at either logistics efficiency in general or at different modes of transportation on their own, but none have examined the actual ways that the different modes operate together under one coordinated contract in actual exports. Many sources of literature talk about the potential benefits of multimodal transport systems (reduction in costs, faster transportation, greater flexibility) but fail to take into consideration the real-life problems associated with these types of systems, such as the lack of coordination between transportation agencies, delays during mode changes, and customs issues. Furthermore, the majority of current research has been done in developed countries where the infrastructure and digital capabilities are much more developed, so there is a lack of focused research on developing countries like India, where there are many unique and compounding challenges for freight forwarders, such as port congestion, limited use of technology, poor roads, and regulatory complexity. Another gap exists in the lack of human and operational issues related to freight forwarding that tend to arise daily (e.g., pressure from communication barriers, uncertainty in decision-making, and unexpected supply chain disruptions). The intent of this study will be to fill this gap through an empirical study conducted in the field.

## REVIEW OF LITRATURE:

According to the council for supply chain management professionals (CSCMP) 2015, logistics operations consist of systematic function planning and controlling transportation, warehousing, inventory and information flow and have a direct effect on the fulfilment of organisational objectives by means of better responsiveness to needs, as well as lower total supply chain costs. Stock and Lambert (2001) expand on the earlier definition by stating that effective logistics management involves cross-functional integration, and when there is poor coordination between logistics and production and marketing, systemic inefficiencies will occur and customers will be dissatisfied

Fugate, Mentzer, and Stank (2010) proved, using empirical data, that organizations with high-quality logistics operations not only deliver goods to their customers at a quicker pace than competitors but also show greater market performance by exhibiting discipline in their costs, as well as increased periods of flexibility in their operations. In this same area of study Langley et al. (2013) identified three primary drivers of change in logistics, including technology, outsourcing and risk management; as a result, having third-party logistics providers significantly enhances the efficiency of those business entities with limited capabilities in-house with respect to logistics services.

Route optimisation and load consolidation in the transportation process have been shown by McKinnon et al. (2015) to ultimately lower fuel cost and greenhouse gas emissions. With more pressure being placed on freight forwarders to implement sustainable practices, reducing both types of costs is becoming an increasingly significant concern. Logistics infrastructure development was identified by Sahay and Mohan (2003) as being the most important driver of logistics efficiency within the emerging markets to which this study pertains. This finding has particular relevance to India.

According to Thai (2013), the most important factors when assessing service quality in port logistics are both timeliness and reliability. Waller, Fawcett, and Stanley (2013) have also shown that using big data analytics can help you improve your forecasting accuracy as well as your ability to plan transportation networks. Rao and Holt (2005) point out that by using environmentally responsible logistics practices, companies can improve their overall business image and their operational efficiency, suggesting that there is an increasing convergence of sustainability and competitive advantage.



Jhawar et al. (2017) studied last-mile logistics issues in India and found that by implementing green urban logistics planning, last-mile delivery speed and customer experience improved significantly. Collectively, it is clear from these studies that technology adoption, coordination among stakeholders, infrastructure quality and legal compliance are components of logistics efficiency; all of which relate directly to the issues being studied in this research.

## RESEARCH METHODOLOGY

A Research Project's methodology indicates how research will be done with an analytical/scientific view. This chapter includes: How the information we used in the research was compiled; how the sample was chosen and how we analysed the data gathered from this research study using analytical tools on export freight forwarding and multimodal issues..

## RESEARCH DESIGN

This research will use descriptive design and will not manipulate any variables. This research will focus on observing and documenting the current practices, operational issues and work environments of the freight forwarding industry. Descriptive is an appropriate research design since the purpose of this research is to describe the current state of multi-modal export logistics, identify pain points that exist, and generate some meaningful insights related to data collected from primary respondents. This design also allows for both quantitative and pattern analysis of heterogeneous respondents.

## SOURCE OF DATA

**PRIMARY DATA** From logistics staff via surveys and interviews using questionnaires and long form correspondence. There were logistics managers; operational; executive-level; customs brokerage (import/export); business owners/directors; as well as any other staff; partner(s) in freight forwarding or 3PL-type activities.

**SECONDARY DATA:** Many of the sources consulted in writing this paper came from secondary sources such as academic books on logistics and supply chain management, professional; journals, annual reports, and web pages provided by companies, trade bodies (e.g. FIATA and FFFAI), and databases (e.g. WTO, UNCTAD, IATA, and the World Customs Organisation).

## SAMPLING

The workforce consists of individuals employed in jobs related specifically to logistics/supply chain management roles (e.g., Logistics Managers, Operations Managers, Warehouse Supervisors, Transport Coordinators, Customs brokers). Non-probability convenience sampling was selected for this study because of its exploratory nature, the inability to access a complete list of the total study population from the network of participants, and the short time-frame for obtaining respondents due to the nature of their jobs. There were a total of 47 respondents for this study, each voluntarily participating and assured of anonymity and confidentiality. Although there are limitations in using convenience sampling regarding statistical generalisability, there is significant acceptance of its employment amongst exploratory logistic studies seeking to gain new insights rather than obtain statistically valid data.

## DATA ANALYSIS TOOLS

The following analysis techniques were employed to address the study objectives:

- Percentage Analysis — this technique allowed for the standardisation and comparison of response frequencies across the various questionnaire items.
- Descriptive Statistics — mean and standard deviation calculations were used for all 17 Likert-scale items to help summarise central tendency and response variability.



- ANOVA (Analysis of Variance) — was conducted to determine whether the perceptions of the key operational variables were significantly different between the various designation groups and the different levels of experience.
- Chi-Square Test — was used to determine whether significant associations existed between the demographic variables (designation, experience) and selected operational perceptions.
- Pearson Correlation Analysis — was used to determine the strength and direction of the linear relationship between the various operational variables.

## DATA ANALYSIS AND INTERPRETATION

Chapter 5 is a report of the findings of the study based on primary data sourced from 47 participants using Likert scales on each item with a range from 1 = Strongly Disagree to 5 = Strongly Agree, as well as Yes/No or True/False questions that would be counted as 2 = Yes/True and 1 = No/False for the sake of clarity.

## DESCRIPTIVE ANALYSIS

The table below presents descriptive statistics for all 17 survey items. Mean scores between 3.41–5.00 are interpreted as 'Agree', 2.61–3.40 as 'Neutral', and 1.00–2.60 as 'Disagree'.

#	Variable	N	Mean	Std. Dev.	Interpretation
Q1	Freight-Forwarding Accuracy	47	3.70	1.10	Agree
Q2	Documentation Procedures	47	3.49	1.33	Agree
Q3	Timeliness of Cargo Delivery	47	3.30	1.18	Neutral
Q4	Customs Clearance of Cargo	47	3.36	0.94	Agree
Q5	Customs Clearance Efficient & Reliable	47	3.30	1.20	Neutral
Q6	Freight Charges are Reasonable	47	3.68	1.07	Agree
Q7	Good Communication between Exporter & Freight Forwarders	47	3.43	1.31	Agree
Q8	Adequate Supporting Risk	47	3.74	1.19	Agree
Q9	Multi-Modal Transportation Lower Logistics /Transport Cost	47	3.15	1.29	Neutral
Q10	Satisfaction of Customers only dependent upon Delivery	47	3.23	1.51	Neutral
Q11	Delays Created by Coordination	47	3.19	0.99	Neutral



#	Variable	N	Mean	Std. Dev.	Interpretation
Q12	Difficulties with Customs	47	3.68	0.94	Agree
Q13	High Transportation Costs negatively affect International Competitiveness	47	3.72	1.28	Agree
Q14	Insufficient Infrastructure creating difficulties moving cargo	47	3.57	1.31	Agree
Q15	Increased Risks of Cargo Damage with Multi-Modal Transportation	47	3.57	1.30	Agree
Q16	Inadequate Integration of Technology Within Systems	47	3.60	1.10	Agree
Q17	Difficulties with Tracking Cargo Moving Across Multiple Modes	47	3.43	1.28	Agree

INTERPRETING THE RESULTS: With mean (M) scores between 3.15 and 3.74, there was a moderate to positive response across all factors.

1. Q8 - Adequate Risk Management Support (3.74)
2. Q13 - High Transportation Costs Affect Competitiveness (3.72)
3. Q6 - Freight Charges are Reasonable (3.68)

- When examining which respondent groups felt positively regarding these items, the groups that gave low M scores (< 3.50) were the Executive/Management; Human Resources; and Shipping/Receiving groups.

- Therefore, at least some of these factors do not reflect the views of most groups surveyed or at least some of their members.

- This was also evident in regards to the lowest score; Q9 - Multi-Modal Transportation Reduces Overall Logistics Cost (3.15) was also ranked low collectively as the subject matter is highly contested among practitioners. (N.B., Q9 reflects overall Logistics cost).

There was also evidence of variability in views between respondents supporting the finding of extremely polarised (i.e., very large spread) responses among the four identified factors (SDs between 0.94 and 1.51); for example, Q10 had the largest amount of spread from the mean (SD = 1.51). Therefore, there are extremes in opinion regarding the link between delivery performance and customer satisfaction reflecting strong divisions between two separate groups. Despite this evidence that freight forwarding services are valued globally, the operational and infrastructural issues regarding freight forwarding logistics have been identified as key areas of concern.



## CHI-SQUARE TEST

In order to investigate if there are significant correlations (or associations) between the different categories of demographic data, namely designation and experience, and certain attitudes towards operations, the researcher performed chi-square tests of independence on the research sample. The research sample consisted of 47 valid responses, all of which were collected (no missing cases).

H<sub>0</sub>: There are no significant relationships between the categorical demographic variables and the categorical operational perceptions

H<sub>1</sub>: There are significant relationships between the categorical demographic variables and the categorical operational perceptions

Test	$\chi^2$ Value	df	Asymp. Sig. (p)	Decision	Result
Designation vs. Years of Experience	9.814	12	0.632	Fail to Reject H <sub>0</sub>	Not Significant
Designation vs. Q7 (Export Efficiency)	12.543	16	0.706	Fail to Reject H <sub>0</sub>	Not Significant
Designation vs. Q13 (Customs Difficulties)	4.221	4	0.377	Fail to Reject H <sub>0</sub>	Not Significant

INTERPRETATION: The three contingency analyses all provided results later than 0.05 for determining statistical significance between designations and years of service ( $\chi^2 = 9.814$ ,  $p = 0.632$ ), perceptions of efficiency in exports ( $\chi^2 = 12.543$ ,  $p = 0.706$ ), or perceptions of customs-related impediments ( $\chi^2 = 4.221$ ,  $p = 0.377$ ). Thus, none of the empirical p-value observations were less than 0.05, leading researchers to accept the null hypothesis, suggesting that job designation and seniority did not adversely affect respondents' operational perception. This could indicate that the identified challenges are due to structural systemic failure within the industry rather than having developed as a result of being part of a customer base representing multiple groups of individuals connected by shared experiences or demographic characteristics.

## CORRELATION TEST

Pearson Correlation analysis was perused to ascertain both the strength (degree) and direction (positional) of any linear relationships for each of the eight (8) key operational variables of the freight forwarding business. All tests were bi-directional:

H<sub>0</sub> - There is no statistically significant association between any of the operational variables for freight forwarding; or

H<sub>1</sub> - There is a statistically significant positive association between two or more of the operational variables for freight forwarding.

Variable Pair	Pearson	Significance	Strength
Q13 (Transport Costs) ↔ Q14 (Infrastructure Deficit)	0.614	$p < 0.01$	Strong Positive
Q7 (Communication Effectiveness) ↔ Q8 (Risk Management)	0.521	$p < 0.01$	Strong Positive
Q1 (Export Efficiency) ↔ Q13 (Timely Delivery)	0.512	$p < 0.01$	Moderate Positive



Variable Pair	Pearson	Significance	Strength
Q3 (Timely Delivery) ↔ Q14 (Infrastructure Deficit)	0.463	p < 0.01	Moderate Positive
Q16 (Tech Integration) ↔ Q14 (Infrastructure Deficit)	0.478	p < 0.01	Moderate Positive
Q16 (Tech Integration) ↔ Q7 (Communication Effectiveness)	0.467	p < 0.01	Moderate Positive
Q1 (Export Efficiency) ↔ Q3 (Timely Delivery)	0.438	p < 0.01	Moderate Positive
Q7 (Communication Effectiveness) ↔ Q3 (Timely Delivery)	0.427	p < 0.01	Moderate Positive

INTERPRETATION: Each pair of pairs has been demonstrated to have positive correlations and the null hypothesis has been rejected in all cases. The two pairs with the strongest correlation were Q13 (High Transportation Costs) and Q14 (Lack of Infrastructure) ( $r = 0.614$ ,  $p < 0.01$ ), indicating that the lack of infrastructure and high transportation costs are structurally linked, and therefore, one cannot be effectively addressed without addressing the other. Another key relationship was the second strongest correlation: Q7 (Communications) and Q8 (Risk Management) ( $r = 0.521$ ), demonstrating that effective communication among stakeholders is the primary enabler of risk-management capability for freight forwarders. In addition, Q1 (Export Efficiency) is significantly correlated to Q3 (Timely Delivery) ( $r = 0.512$ ) and Q6 (Reasonable Charges) ( $r = 0.438$ ) further reaffirm the relationship between timely delivery and reasonable pricing as the most critical elements affecting perceived export efficiency. Finally, given that all correlation magnitudes were positive in nature, the operational dimensions of freight forwarding are highly interrelated and, thus, the use of integrated solutions will produce better results than utilizing isolated solutions will achieve..

## FINDINGS& SUGGESTIONS:

### FINDINGS

- 57.4% of respondents see freight forwarding services as facilitating export performance; therefore, respondents believe forwarders provide operational capabilities that aid in exports and assist in the export supply chain.
- 59.6% of respondents evaluated freight forwarders' documentation management as positive, leading to a conclusion that freight forwards perform documentation tasks to an acceptable level of skill.
- 53.2% of respondents reported satisfaction with shipment's delivery date, but 34% respondents did not; thus, delivery service inconsistencies in these areas create a significant service gap in regards to timely delivery and impede customers' confidence in freight forwarders.
- 68.1% of respondents confirmed that the implementation of digital tracking systems provides real-time visibility of goods/titles in transit; this "technology adoption" technology finding is the most positive conclusion reached in this study.
- Freight forwarders' customs clearance activities are viewed as possessing some level of inefficiency as only 42.6% of respondents considered those activities to be efficient and reliable; significant numbers of respondents did not agree with or were neutral regarding the efficiency of freight forwarders' customs clearance activities, indicating the continued existence of significant bottlenecks in regulatory customs clearance processing for forwarders.



- While 55.3% of respondents think freight forwarders' pricing is reasonable, there are a relatively large group of neutral respondents raising concerns regarding possible future price increases therefore indicating the possibility of latent pricing sensitivity and the potential of having dissatisfied customers as a result of an increase in freight pricing.
- 59.6% of respondents indicated that there were delays according to functional inefficiencies resulting from ineffective intermodal schedules, identifying that synchronisation between multiple modes of transport forms a primary operational weakness in multimodal logistics.
- 66% of respondents believe that customs restrictions create business challenges for freight forwarders, illustrating that customs regulation compliance complexity presents a systemic burden for freight forwarders. 59.6% agreed that high transportation costs negatively impact export competitiveness, making logistics cost reduction a strategic imperative for Indian exporters.
- 63.8% noted how inadequate infrastructure impedes cargo from moving in a timely manner; port congestion, limited road access, and inadequate warehousing were all mentioned as primary structural impediments;
- 59.6% experienced increased risk of cargo loss when using multiple modes of transportation (i.e., inter-terminal transfer) because goods are subject to handling risks during changes of mode of transportation;
- 48.9% felt inadequate technology integration between modes of transport to be an operational challenge, indicating that many digital ecosystems are heterogeneous, thus preventing logistics from being integrated into overall supply chain performance;
- ANOVA analysis yielded no statistically significant differences among designation (all  $p > 0.05$ ) nor among years of experience (all  $p > 0.05$ ); therefore, these challenges are systemic in nature rather than specific to any particular role in the supply chain;

## SUGGESTIONS

- Improving Delivery Guru costs time, so it is important for freight forwarders to make more use of realtime routing software, build stronger relationships with carriers and regularly monitor shipments to identify problems early on.
- Customs Clearance is another area that can be improved thru closer working relationships with Customs, using automating documenting methods and filing electronic documents with Customs along with having a dedicated group focus on compliance will all help to reduce processing time and fines.
- Investing in Integrated Systems Solution will also help improve these areas. Having a single database for all types of transportation (road/rail/sea/air) connecting with per order access and full visibility into where a shipment is located will eliminate technology overlaps between providers and provides true end to end visibility along the supply chain.
- Building stronger coordination among inter-modal carriers will also reduce the amount of time it takes to move from one mode to another mode. Setting up standardised hand-off protocols, establishing synchronised scheduling between modes, building joint operations dashboards with carriers will all help to reduce delays when moving from one mode of transportation to another mode.
- Reducing Logistics Costs thru Load Optimisation will reduce transportation costs on each shipment significantly. By using route consolidation, shared loads, and selecting carriers based on cost and on purpose will each greatly reduce per unit transportation costs.
- Freight Forwarding Associations should work with Government agencies to make port-modernization, develop dedicated freight corridors and provide connectivity from airports to rural roads; all of these investments will add onto efficiency gains for everyone involved in transporting freight.
- Cargo Risk Management requires all Multi-Mode Shipments be completely insured; the packaging standard and procedure must be in place to avoid damage when moving to another mode.



- Upskill Logistics Team: To increase operational performance and reduce human error, the logistics team needs training programs that are structured for compliance with customs, digital logistics systems, cargo handling, and intercultural communication.
- Implement Sustainable Logistics Practices: Freight forwarders should have a carbon footprint tracking mechanism, use fuel-efficient carriers, and buy offsets for their emissions to meet regulatory requirements and clients' needs for sustainability.
- Creating Customer-Centric Service Delivery: Communication must be transparent, delivery times be predicted, shipping choices must be flexible, and resolution of grievances must be prompt each time to ensure long lasting client relationships .

## CONCLUSION:

The analysis demonstrates a subset of ongoing systemic operational issues in the area of freight forwarding; in particular, delays resulting from poor inter-modal coordination, varying delivery performance levels, burdens created by customs compliance, high transportation costs, inadequate infrastructure, and fragmented technological ecosystems were all highlighted as significant concerns by the sample of respondents. In addition, the statistical testing indicates that all of these operational issues are systemic in nature; therefore, they impact freight forwarding professionals, regardless of designation or years of experience.

In terms of correlation analysis, the most compelling finding was that infrastructure restrictions and transportation costs are the two most highly correlated challenges in the Indian freight forwarding environment ( $r = 0.614$ ). Further, communication effectiveness and risk management capabilities are also closely tied ( $r = 0.521$ ), reinforcing the importance of stakeholder dialogue from an operational perspective. As a result, the interdependence of these two groups of operational challenges creates a need for holistic solutions, as opposed to piecemeal solutions, which will only provide limited benefits to industry practitioners. What is required within the Indian freight forwarding industry is an integrated approach consisting of digital transformation, investment in infrastructure, regulatory reform, and workforce development.

Ultimately, the multimodal export freight forwarding business will not succeed based solely on the capabilities of individual firms; rather, it will depend on the overall ecosystem consisting of infrastructure, regulation, technology, and institutional coordination. The research conducted through this study adds to the logistics body of knowledge by providing field-based empirical evidence from the perspective of a developing economy, as well as offering usable recommendations to freight forwarding firms, industry associations, and government policy institutions.

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