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Import and Export Operations for Full Container Load (FCL) and Less than Container Load (LCL) Cargo at a Container Freight Station

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ABSTRACT: International trade depends on efficient logistics, and Container Freight Stations (CFS) play a central role in linking ports, customs authorities, shipping lines, importers and exporters. This study examines import and export operations for Full Container Load (FCL) and Less than Container Load (LCL) cargo at a CFS, focusing on documentation, customs clearance, warehousing, container handling and stakeholder coordination. Data were collected from 48 employees in import, export, documentation, warehouse, customs coordination and administration through a five-point Likert-scale questionnaire, observation and informal discussion. Percentage analysis, descriptive statistics and fishbone analysis were used. The study indicates that import, export and customs clearance activities are reasonably organised, although delays commonly arise from documentation, customs clearance and cargo congestion. FCL handling is comparatively straightforward, while LCL requires greater consolidation, tagging and warehouse coordination. The study recommends documentation automation, employee training, cargo-tracking technology and stronger stakeholder coordination.

KEYWORDS: Container Freight Station, Import Operations, Export Operations, Logistics Management,

I. INTRODUCTION

International trade connects manufacturers, suppliers, shippers, receivers and buyers across borders, making efficient logistics essential for cost-effective and reliable movement of goods. Containerisation has transformed global trade by providing a standardised method of transporting cargo.

Container Freight Stations form an important link between ports and customers. Their activities include stuffing and de-stuffing containers, customs clearance, storage, consolidation and de-consolidation, documentation, container handling and transport coordination. In India, CFS facilities also help reduce port congestion by moving customs-related activities away from the port.

Cargo handled at a CFS is broadly classified as FCL, where one consignor uses the container, and LCL, where cargo from several consignors is consolidated into one container. Both require coordination among shipping lines, customs authorities, freight forwarders, transport operators and CFS personnel. This study therefore examines the procedures, documentation, customs clearance, warehousing and handling practices associated with FCL and LCL import and export operations.

Need for the Study

The continued growth of international trade increases the need for efficient cargo handling and customs clearance. Understanding FCL and LCL operations can help identify causes of delay, improve cargo handling, reduce operational costs and support customer satisfaction.

Statement of the Problem

Delays in customs clearance, documentation errors, container congestion, cargo damage, weak coordination and inefficient handling can increase costs and affect service quality. The study examines these operational issues and the procedures used to manage import and export cargo.

Objectives

- To understand how import and export operations function at a CFS.
- To study the procedures used for handling FCL cargo.
- To examine the process of handling LCL cargo.
- To analyse documentation and customs clearance procedures.

II. REVIEW OF LITERATURE

Prior research highlights the importance of planning, digitalisation, standardisation and coordination in international cargo operations. Leonidou et al. (2025) found that strong import planning is associated with improved efficiency, supplier relationships and business performance. Khanna and Sharma (2025) reported that imports of raw materials and machinery can support productivity and technology adoption in Indian manufacturing. Carballo et al. (2025) showed that import-processing delays increase trade costs, while faster and more digitised clearance can reduce them.

For FCL operations, Van Twiller et al. (2024) found that effective stowage planning improves container utilisation and reduces loading time. Kim et al. (2025) reported that AI-based container-loading approaches can improve loading efficiency. Dhanush and Navitha Sulthana (2025) highlighted the importance of simplified documentation and coordination between Customs House Agents and CFS operators. Sharma and Verma (2025) and Fernando and Kumar (2025) further highlighted automation and integrated logistics management as ways to improve speed, visibility and service efficiency.

III. RESEARCH METHODOLOGY

Research Design

The study adopts a descriptive and analytical research design to examine import and export operations for FCL and LCL cargo, including documentation, customs clearance, warehousing and transportation activities.

Sources of Data

Primary data were collected through a structured questionnaire, direct observation and informal discussions with employees. Secondary information was obtained from academic databases, books, journals, government publications and industry reports.

Sampling and Sample Size

Convenience sampling was used. The sample consisted of 48 employees from import, export, documentation, warehouse, customs coordination and administration functions.

Questionnaire and Analysis

The questionnaire contained demographic questions and operational statements covering import, export, FCL, LCL, documentation, customs clearance, warehousing, cargo handling, customer satisfaction and operational efficiency. Responses used a five-point Likert scale from Strongly Agree (5) to Strongly Disagree (1). Percentage analysis, descriptive tables/charts and fishbone analysis were used.

Limitations

- The study covers a single CFS, so the findings may not generalise to all logistics providers.
- The sample was limited to 48 respondents and data were collected over a short period.
- Operational conditions and responses may vary during different seasons or peak periods.

IV. DATA ANALYSIS AND INTERPRETATION

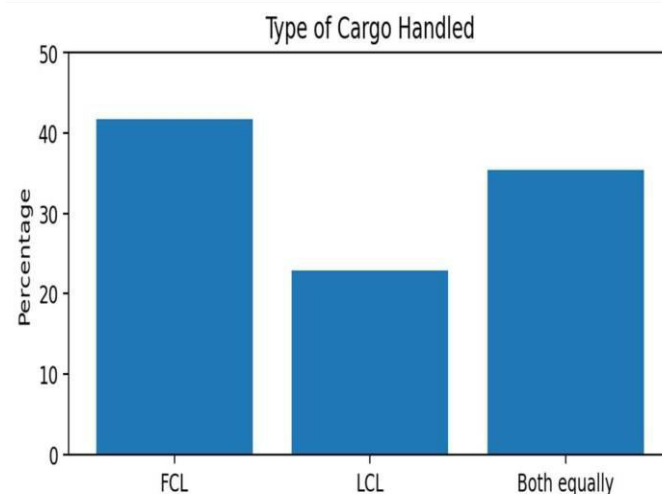
Operation Mainly Handled

Operation	Respondents	Percentage
Import	15	31.3%
Export	16	33.3%
Both Import and Export	17	35.4%
Total	48	100.0%

The largest group, 35.4%, handles both import and export operations, indicating that employees often perform cross-functional responsibilities.

Type of Cargo Handled

Cargo Type	Respondents	Percentage
FCL	20	41.7%
LCL	16	22.9%
Both equally	17	35.4%
Total	48	100.0%



FCL was the most common response at 41.7%, suggesting that FCL operations form a comparatively large part of daily cargo handling. The source data report 22.9% for LCL and 35.4% for employees handling both equally.

CAUSE-AND-EFFECT (FISHBONE) ANALYSIS

The study uses the 6M categories—Manpower, Methods, Systems, Materials, Environment and Stakeholders—to identify operational causes. For departmental participation, uneven staff strength, communication practices, shift patterns and access to digital systems affect participation. For import efficiency, trained staff and standardised

procedures support smooth operations, while peak-hour staff shortages and repeated document corrections create delays.

Digital platforms such as ICEGATE can speed processing, although peak-hour system lag and manual data entry may reduce efficiency. Accurate invoices, packing lists and Bills of Entry support faster clearance, whereas document mismatches can trigger customs queries and delays.

V. FINDINGS

Import Operations

- The import process is generally well organised and follows customs procedures.
- Coordination between the port and CFS supports timely cargo movement.
- Import shipments are generally delivered to customers on time after customs clearance.

Export Operations

- Export cargo is checked, verified and processed according to standard procedures.
- Container stuffing is carried out under supervision with reasonable consistency.
- Export documentation is generally completed before dispatch, helping avoid shipment delays.

VI. SUGGESTIONS

Import Operations

- Reduce paper-based documentation and increase digital processing.
- Provide regular training on customs regulations and import procedures.
- Implement real-time cargo tracking to improve visibility and customer communication.

Export Operations

- Automate export documentation to reduce errors.
- Strengthen coordination with shipping lines to reduce container waiting time and improve vessel scheduling.
- Collect customer feedback regularly to identify service improvements.

VII. CONCLUSION

Container Freight Stations are an important link in international trade, connecting ports, customs authorities, shipping lines, importers and exporters through cargo handling, storage, customs clearance and transport coordination. The study indicates that import and export operations are generally organised, but documentation issues, customs clearance and congestion can still create delays. FCL handling is comparatively straightforward, while LCL requires greater consolidation, segregation and warehouse coordination. Documentation automation, cargo-tracking technology, employee training and stronger stakeholder coordination can improve operational efficiency, visibility and customer service.

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