International trade is the part and parcel of globalised economic systems. Liberalization, privatization and globalization (LPG) and allied provisions of World Trade Organization (WTO) have brought about a host of structural and ideational changes in international trade. They have also substantially increased transnational trade, investment flows and most importantly competition among players. The operating environments of international trade are both costly and complex in a globalised economy. Factors such as distance, document requirements, cultural diversity and customer demand sway the trajectory and success of international trade. Various technical and legal matters concerning international transport, international insurance, terms of transnational trade and cross border challenges are decisive in determining the pattern of international trade. Another problem related to international trade is logistics costs, which tend to be usually higher in intercontinental trade. The most crucial part in international trade is the timely delivery of goods at a reasonable cost by the shipper to the importer through cost effective management. It is this need of cheap but fast transport that renders logistics integral and indispensable to international and intercontinental trade. Logistics helps the entrepreneur gain competitive advantage in transit cost of imports and exports and helps him deliver the product in the right place on right time and at the lowest possible cost. Logistics systems and the management and improvement thereof play a key role in increasing customer satisfaction at the cheapest possible cost with
available resources. Hence the effective management of logistics has the potential to enhance the competitive advantage of a company.

Logistics as a service industry is integral to supply chain management. The term logistics is much broader in scope. It encompasses the procedures related to the physical movement of goods, both upstream and downstream activities, and the management of the relationships with suppliers and customers. It is the management of the flow of goods and other services between the point of origin and the point of consumption in order to meet the requirements of consumers. It includes a harmonization of professional activities such as like planning, controlling, managing, directing, coordinating forecasting, warehousing and transportation. It is the skilful management of time and cost for the better utilization of all modes of transport. It involves the integration of information, transportation, warehousing, inventory management, and manufacturing or materials management. It also involves a variety of value-added services. It is thus a dense array of networks and services which bridges the spatial and temporal gap between the producer and the customer. Delivering the right product at the right time, at the right place and at the right cost helps to attain better logistics efficiency.

The key element of logistics chain is transportation. As transportation constitutes the single largest cost of logistics (one third of the amount in the logistics costs), strategy for logistics efficiency should primarily focus on reducing it. Adequate and efficient transport infrastructure is essential for efficient and cost effective logistics. A good system of transport in logistics activities could provide better logistics efficiency and promote service quality. The very mission of logistics
and supply chain management is to make available the right quantity of the right quality goods at the right time and at place with minimal expenditure. This can be achieved by the wise and efficient use of transportation resources.

Air transport is the vital mode of transport in international trade, especially for high value and value-added products. Air cargo traffic, which makes a significant contribution towards the economic growth of any country, has been registering systematic growth in the liberalization ears. The centrality of air freight traffic can be understood from the fact that although it constitutes only less than 2 per cent of all tonnage transported, it accounts for over 33 per cent of the aggregate value of all international trade. The Indian air cargo scenario heavily depends on international trade which constitutes two third of the total cargo handled our India airports. The five urban airports of Mumbai, Delhi, Chennai, Bangalore and Hyderabad between them share 88 per cent of the total air cargo handled in India. Catalyzed by economic development and rising international trade, air cargo traffic in India has experienced a boom for the last few years. For aspiring and ambitious business houses and individuals, it is imperative to streamline and strengthen air cargo logistics chain. The normal parameters to determine the level of logistics efficiency in handling international cargo business involve factors like sufficiency in cold storage warehousing space, connectivity with land based transportation, capacity of airport, number of runways, length of runways, hours of operation, communication infrastructure and competence of human resources.

Though international air cargo business operations in Kerala are of recent origin and the sector has registered considerable increase. Rapid growth of
international trade, operation of International Trans-shipment Container Terminal at Cochin, expansion of the land based transportation, giant leaps in the telecommunication infrastructure, renovation of various major and minor ports, foreign direct investment (FDI) in retail sectors, etc., have given wide opportunities for the growth of air cargo business in Kerala and renewed impetus to regional economy. Among the different aspects of Logistics Management in International Trade, the focus of this study is the core logistics activities like transportation, freight forwarding, and warehousing and customs clearance in the international airports in Kerala.

1.2 Review of Literature

In order to inform the present study and to bridge the existing literature gap, it was felt appropriate to review the studies in the area of logistics management. Studies conducted in the various aspects related to logistics management were found to be few in number and limited in scope. Among them, no comprehensive study has focused on logistics management in international airports in Kerala. So the present study carried out by the researcher is the first attempt to assess the management of logistics activities in international airports in Kerala. A brief review of earlier studies on the Logistics Management in general and in air cargo traffic is given below.

Chiu (1995)\(^1\) examines the critical success factor in effective logistics management. He opines that the critical success factors in logistics management include good planning of the logistics system, a well-designed distribution organization, the prudent selection of allied companies, a close relationship with
trading partners, good logistics investment analysis, the elimination of barriers to logistics management, commitment of top management and continuous improvement in logistics.

Bosersox and Roger J (1998)\(^2\) discuss the importance of information technology (IT) and logistical competency in the realization of truly global marketing. They explain the effect and operational challenges involved in global logistics and demonstrate how IT has impacted on global operations. They compare the domestic operating environment to the complexity of globalization.

Fernie and Spark (1998)\(^3\) explain the importance of technology in enhancing logistics efficiency. They highlight the way in which breakthroughs in technology and IT have contributed in facilitating logistical efficiency in the distribution network. Technological innovations in material handling and communication can substantially improve the flow of information through the supply chain.

Stock, and Lambert (2001)\(^4\) explain the importance of logistics and logistics cost savings of firms. They suggest that logistics costs savings can have a greater impact on firm’s profitability than increase in sales volume can. Logistics also plays an equally important role in generating value advantage by the creation of product’s time and place utilities.

Vijayaraghavan (2001)\(^5\) focuses on the importance of transportation in logistics. He states that transportation is the backbone of the entire supply chain. Transportation makes it possible for a company to achieve the well-known seven
‘R’s—the Right product in the Right quantity and the Right condition, at the Right place, at the Right time for the Right customer at the Right cost.

According to Krishnaveni Muthiah (2002) cargo handling infrastructure at the major airports in India is severely crippled by factors such as lack of modernization, particularly inadequate space, lack of proper cold storage facilities, outdated equipment, pilferage and theft.

Kemthose P. Paul (2003) identifies IT as the mainstay of supply chain management. Planning and control functions performed by logistics managers rely on quick, accurate and relevant data. So building an information system for data capture, storage, and use is a pre-requisite of any good modern supply chain management system. He also recommends an efficient software system to support a well-designed supply chain system.

Sahay and Mohan R (2003) discuss the spending of India on logistics costs. They state that the Indian industry spends an exceptionally high amount of its gross domestic product (GDP) on logistics. India’s logistics cost has been estimated to be around 14 per cent of its GDP, out of which 40 per cent can be attributed to transportation alone.

Sahay and Mohan R (2003) explain the importance of third party logistics as far as firms are concerned. They are of the opinion that most third party logistics users are satisfied with the current level of services offered by third party logistics service providers as they have had a salubrious impact on business results. So the use of third party logistics services is likely to increase substantially in the future. More
and more companies are planning to use the service of third party logistics providers in the future because the benefits such as logistics cost reduction, ability to focus on the core business, and improving supply chain efficiency. But the third party practices (3PL) are still in their infancy in India. Only 55 per cent of Indian companies subscribe to third party logistics services as compared with 75 per cent globally and these seem to be more of transportation and warehouse related activities. It is evident that use of 3PL services can help an organization achieve substantial results, both in terms of customer satisfaction and logistics cost reduction. Given its potential and possibilities, the future of 3PL is bright and promising.

Mc. Kinnon (2004) identifies certain features pertaining to airports competition viz. 1) location, airports located closer to shipper enjoy the advantages of time and cost, 2) airport infrastructure including runway capacity, terminal setup and transport connectivity, 3) airport charges, 4) customs rules and charges 5) congestion and lack of slot availability 6) Choice and quality of freight forwarders 7) environmental restrictions such as noise limits and night curfew and 8) regulatory restrictions.

Satish C Ailawadi& Rakesh Singh (2005) point out that the concept of logistics was introduced due to the need for planning and coordinating the material flow from source to user as an integrated system rather than as a series of independent activities. They also point out that the objective of logistics is to provide higher levels of service to the consumer at more affordable costs by linking the market place, the distribution network, the manufacturing process and procurement activity. The logistics competency is achieved by coordinating the
fundamental areas such as network design, information, transportation, inventory, warehousing, material handling and packaging.

Yung-Yu Tseng (2005)\textsuperscript{12} accentuates the role of logistics and transportation. The overall performance of a logistics system can be changed by improving transport efficiencies because transport accounts for the highest cost among the related elements in the logistics systems. He also opine that there is an interdependent relationship between transport and logistics system. A successful logistics system can improve traffic environment and transportation development.

Andreea Popescu(2006)\textsuperscript{13} provides valuable strategies for more efficient management of revenues and capacity for airlines and freight forwarders. The objective of his study was to develop methods to improve both freight forwarders and airlines, action when dealing with air cargo.

John D. Kasarda(2006)\textsuperscript{14} concludes that competition from other modes of transport put additional pressure on the air cargo industry to increase its own efficiency and live up to its potential. The liberalization of aviation sector both creates the motivation and opportunity to improve efficiency by increasing load factors, decreasing dwell times, and enhancing the use of planes.

K Ramachandran (2006)\textsuperscript{15} reports that in the two-day seminar on logistics held at Loyola College, Chennai, the speakers of the seminar pointed out that the current problem in logistics is higher transportation time, high transaction costs and poor logistics services. The expert in the seminar advised that constant research in logistics was the need of the hour to ensure India’s position does not fall behind in
the global market. The aim of the seminar was to popularize the concept of logistics among students and sensitize them to extent of employment opportunities available in the field of logistics.

Sahay B.S (2006)\textsuperscript{16} studies the current state of supply chain management practices followed in Indian organizations. The objective of the study is to identify the important areas that need improvement in order to gain competitive advantage. The findings of the study reveal that most of Indian organizations have aligned their supply chain objectives with their business objectives.

Martin Christepher (2007)\textsuperscript{17} states that effective logistics management can be a major source of competitive advantage. Superiority over competitors in terms of customer performance may be achieved only through effective management of logistics. He also states that the ingredients of success in the market place are numerous but it is based on the three ‘C’s— the triangular linkage of the companies, its customers and its competitors.

MD.Harshid Bin Haron( 2007)\textsuperscript{18} states that because of globalization and liberalization in the trade sector, current business environment has become more competitive than ever. A radical qualitative change in the nature of competition is inevitable fallout of the new ethos. Companies are forced to seek ways to enhance their competitive edge in order to survive and make profit. So he opines that supply chain management in general and logistics management in particular is identified as a source of competitive edge.
Report of Working group on Logistics (2007)\textsuperscript{19} recommends the following strategies to increase optimize the output of logistics:

(1) definite, measurable performance parameters at every stage in the flow of cargo documentation and information; (2) speed and reliability on clearing of cargo need to be imparted through just in time processes; (3) online connectivity among all stakeholders, and importers and exporters should be enabled to file all the documents at a single window; and (4) standardized and streamlined facilities and procedures for transshipments, imports and exports need to be ensured at every international airport.

Hua Song, Lan Wang (2009)\textsuperscript{20} examines the current practices of logistics cost management in mainland China and identifies certain factors determining the effectiveness of logistics cost management. He finds the difficulties of logistics cost management in China. According to him the difficulties are manifold, the first being the lack of effective cost measurement tools and analysis as well as reporting system especially in terms of distributors. Second is the shortage of professional logistics managers, even among logistics service providers. He suggests government and educational institutions provide more resources to develop and offer more logistics courses and training programme to meet the requirements of the industry.

Ramnath Raghavan (2010)\textsuperscript{21} states that “Air cargo industry in Kerala has miles to go”. The infrastructure facilities in Trivandrum and Calicut airport are inadequate for air cargo traffic.
Ms. Anita Khurana (2010)\textsuperscript{22} says that passenger airlines in the country, until recently, did not take cargo business seriously. The cargo division contributes only 5-10 per cent of their revenue.

Chethan (2010)\textsuperscript{23} opines that “The Indian air cargo industry is still in a gestation period”. There is sufficient aircraft belly capacity which, if utilized efficiently, can make good business opportunities for the airlines.

Ashish Kapur (2011)\textsuperscript{24} reports that the biggest challenge for the growth of air cargo is infrastructure. Warehouse infrastructure is a big problem. It takes 5-6 days, on an average for the truck to reach the warehouse in Delhi. This offsets the time advantage that air cargo gives. He recommends installation of private bonded warehouse with customs checks to tide over the crisis.

Manmohan Singh (2011)\textsuperscript{25} says that, “with the building of International Transhipment Terminal in Vallarpadam, our exports can now access mainline container vessels calling at one of the most well located ports of India. The International Terminal in Vallarpadam is a long awaited milestone in the development of our country’s logistics infrastructure”.

International Conference on Air Cargo Industry (2011)\textsuperscript{26} points out some of the key areas where India’s air cargo industry lags behind its global peers. These key areas are lack of enabling infrastructure, lack of automated material handling systems, high manual intervention in the processes and inadequate skilled manpower.
Ribilpe Kavoor (2011) suggests some strategies to ameliorate airport revenue. The suggestions include a hike in cargo handling charges, better infrastructure facilities which will help to handle more cargo in the shortest time, attracting wide-bodied aircraft and freight operations from Cochin. He also suggests that the airport provide more facilities to various exporters expand warehouse and space for storage and need proper coordination between customs and airlines.

Aswathy Chandran (2012) in her study tries to understand the security effectiveness in Cochin International Airport Limited. The study finds that the extent of technology innovation at CIAL is unsatisfactory. The access control systems are limited and need improvement. Delay in security checking process during peak hours is yet another handicap that that preventing CIAL from scaling greater heights.

Shyam Prakash. K (2012) analyzes the extent of Information and Communication Technology in air cargo traffic in CIAL. He finds that in CIAL, ICT application is limited and that the company is too much dependent on traditional communication methods. He also finds that the EDI system in the airport is not full-fledged due to lack of awareness on the benefits of ICT and the lack of management commitment to EDI.

Report of Working Group on Air Cargo Logistics (2012) for the first time identifies air cargo logistics as a key constitutive element of Civil Aviation sector. The report points out that the domestic and international air cargo throughput is expected to grow by eight to ten times as the present level in the next 20 years. So expansion of infrastructure facilities, simplification of customs procedure, and
adoption of information technology, automation and development of human resource are needed in this sector to ensure growth.

World Bank Report on Trade Logistics (2012)\textsuperscript{31} reveals that India’s Logistics Performance Index rank in 2012 was 46 down from 39 in LPI 2007 and it was 47 in 2010. In comparison to India, China’s LPI 2012 rank was 26 up from 30 in 2007 LPI. World bank finds out the LPI by calculating the weighted average of the country scores on the six key dimensions: 1) efficiency of clearance process, 2) quality of trade and transport related infrastructure, 3) ease of arranging competitively priced shipments, 4) competency and quality of logistics services and 5) ability to truck and trace consignment 6) timeliness of shipments in reaching destination within the scheduled or expected delivery time.

Report of Working Group on Air Cargo Logistics (2012)\textsuperscript{32} points out that the key stumbling block to the growth of the air cargo sector in India are the lack of adequate and appropriate air cargo infrastructure at airports. It also points out some of the key infrastructure facilities which are lacking at most of the air cargo complexes as 1) shortage of landside truck docks, vehicle holding area and air side operational space 2) insufficient entry gates and lack of upgraded handling equipment and trolleys 3) lack of specialized storage and handling facilities for hazardous, radioactive and valuable cargo and 4) lack of sufficient cold storage for perishable cargo. The report recommends enhancement of efficiency of air cargo operations in India airports, and to meet challenges of growing needs of business and industry. One of the major recommendations in the report pertains to setting up of Air Cargo Logistics Promotion Board.
Vijayan Pillai (2012) comes up a study on the logistics management of vehicle movement of the automobile giant Ashok Leyland to understand the logistics aspects in transporting vehicles from the production centers to various locations and the issues faced by the company during transportation of the vehicles. He states that an appropriate logistics system has to be evolved for cost reduction in automobile transportation. The study finds that the application of statistics and operation research models will pay rich dividends for any organization. The implementation of optimal transportation method to move vehicles from different factories to different destinations will bring huge amount of savings for Ashok Leyland. The study concludes that if the automobile companies implement scientific tools for their logistics management, the consumers will be highly benefited with lower price of the vehicles which will eventually lead to better growth of the industry and a more vibrant national economy.

Stephen Hays Russel examines the historical evolution of management up to its newest frontier-supply chain management. The 1990s were a decade when logistics management came of age in management thought and in private sector business enterprises. In the late 1990s an entire culture focusing on supply chain emerged. According to Russell supply chain management is more than integrated logistics because it involves more than logistics. Managing a supply chain involves activities that are outside the purview of logistics.

The above review reveals that even though many studies have been conducted on the different aspects relating to logistics management and air cargo traffic there is no specific and comprehensive study on the logistics management in international airports.
airports in Kerala. The present study becomes germane under these circumstances and is undertaken with a view to filling this vacuum.

1.3 Statement of the Problem

Globalization and trade liberalization have resulted in tremendous growth of air cargo traffic in India. But the level of competition is rather tough and the competing units have to face series of challenges, both from within and outside the country. Therefore, a logistics facility in the airport plays a very significant role in the international trade. Effective management of logistics activities in the airport can provide a major source of competitive advantage in international trade. Growth of air cargo traffic depends on the efficiency in management of core logistics activities in the airport such as transportation, freight forwarding, warehousing and customs clearance. It is in this context that logistics management as a discipline is taken up by institutions of higher esteem, both at the academic and functional levels. Logistics management, as seen today, is focusing on the effective use of scarce resources and tries to deliver the products at the right place and at right time, and to achieve customer satisfaction.

Kerala has three international airports in Trivandrum, Cochin and Calicut handling both international and domestic flights and the rapid growth of the international trade of India has boosted the prospects of air cargo market in the state. Though the international airports are in the growing stage, it is necessary at this stage to empirically assess the level of efficiency in managing the logistics activities in the airport and to make it commensurate with the growing demand of air cargo traffic in
Kerala. It is in this context that a study on the management of logistics activities in international airports in Kerala captioned “Logistics Management in International Airports in Kerala” is taken up.

1.4 Significance of the Study

Globalization has ushered in a business environment that is exceedingly vibrant, prosperous, competitive and most importantly transnational. The consequent increase of international trade has boosted prospects for air cargo market in India. But the growth of international trade through air depends upon the efficient, cost effective, reliable and timely management of logistics activities in the airports because logistics management is the core component in the international trade. There is a strong relationship exists between growth in international trade and logistics infrastructure. Efficient logistics infrastructure can reduce the cost of transportation because it is the major element in logistics costs.

Air cargo logistics plays a vital role in the economic development of India. After Globalization and Liberalization of Aviation Policy, air cargo traffic in India has registered significant growth in international trade. It has boosted the air cargo traffic in Kerala also. Though the international airports in Kerala are in nascent stage, the quantity of cargo shipped through air is growing significantly. But this growth very much depends upon the regional air cargo logistics efficiency which is achieved through efficient management of logistics activities in the airports. Hence the study strives to assess how well and effectively are the logistics operations managed in our airports. The study scrutinizes the performance of air cargo traffic and tries to assess
its growth potential. It also studies the existing system of logistics facilities in the airports and identifies the areas that call for improvement. In Kerala, no significant study in this field has been undertaken till date and hence the results of the present study will contribute to the existing literature in this area and the recommendations offered will be useful to airport authorities in improving the logistics facilities available there.

1.5 Scope of the Study

The scope of the study limited to assess the logistics activities performed in the international airports in Kerala with regard to international air cargo traffic. Domestic air cargo traffic is excluded from the study because the volume of domestic trade in international airports in Kerala is insignificant. In Trivandrum and Calicut airports domestic trade constitutes nearly four per cent and in Cochin airport it is nearly eighteen per cent of the gross air cargo traffic. The study aims to review the existing status of logistics services available for international air cargo traffic in Kerala and to identify reform measures so as to facilitate and enrich air cargo traffic. For this purpose an assessment of performance of international air cargo traffic in Kerala was made. The main logistics activities in international trade in the airports such as freight forwarding, warehousing and customs clearance required for moving goods from origin to destination were also addressed and assessed. The study has been conducted based on the data from airport records and the opinion of freight forwarders (Clearing and Forwarding Agents) with regard to logistics activities such as freight forwarding, customs clearance and warehousing in the airports.
1.6 Objectives of the Study

The major objectives of the study, generally speaking, are to observe and evaluate the logistics management practices followed in the international airports in Kerala. More specifically, the objectives of the study are:

1. To evaluate the performance of international air cargo handled through the different airports in Kerala
2. To assess the market share of different airlines in air cargo traffic in the aforesaid airports.
3. To assess the logistics services performed by freight forwarders in air cargo traffic in Kerala.
4. To analyze the management of logistics activities in bonded warehouses in the different airports in Kerala.
5. To forecast demand of air cargo traffic through different airports in Kerala

1.7 Data base and Methodology

In pursuance of the objectives stated above, the following methodology was adopted for conducting the present study.

1.7.1 Nature of the Study

Since the purpose of the study is to describe the logistics management practices followed in the international airports in Kerala, an assessment is made about the volume of air cargo transactions through different airports. The share of various airlines in this regard, the logistics services rendered by freight forwarders, the management of logistic activities in bonded warehouse and the demand
forecasting of air cargo traffic through the international airports are covered in this study. This study is both analytical and descriptive in nature, with the support of both primary and secondary data.

1.7.2 Secondary Data

The relevant data pertaining to the international air cargo traffic for the period 2006-2012 is collected from the records of the airports concerned. Detailed reports regarding total exports and imports of cargo through each airport, categories of cargo handled, market share of different airlines are gathered from this source. The sources like books, journals, newspaper reports, government publications and information from websites are also used wherever necessary.

1.7.3 Primary Data

The primary data for the study have been collected from the officials of the airport authorities, clearing and forwarding agents and other related operators. Primary data from airport authorities are collected through personal interviews and discussions. The required information from the operators, and clearing and forwarding agents are collected through the structured interview schedule. The total number respondents selected from this group came to 115.

1.7.4 Sample Design

The universe of the study consists of the Freight Forwarders(C&F agents) functioning in the International Airports in Kerala. As per the list available from the airport authorities, the total number of C&F agents operating in Cochin, Trivandrum and Calicut is 348. Though many Customs House Agents (CHA) are functioning in
these airports (rendering customs clearance services only) they are not included in the purview of survey. From the universe, approximately one third was randomly selected as sample. The total number of samples so selected came to 115 C&F agents (45 from Cochin, 40 from Trivandrum and 30 from Calicut). The following table shows the distribution of sample units.

Table 1.1

<table>
<thead>
<tr>
<th>Airports</th>
<th>Total Population</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cochin</td>
<td>134</td>
<td>45</td>
</tr>
<tr>
<td>Trivandrum</td>
<td>122</td>
<td>40</td>
</tr>
<tr>
<td>Calicut</td>
<td>92</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>348</td>
<td>115</td>
</tr>
</tbody>
</table>

1.7.5 Collection of Data

The pre-structured interview schedule was subjected to sufficient rounds of pre-test and pilot study, particularly to measure the reliability, before serving it to the respondents. The interview schedule was administered to the randomly selected respondents from Cochin, Trivandrum and Calicut. The primary data was collected from July – December 2012. The data collected from the respondent have been analysed by using suitable mathematical and statistical techniques with the help of computer, keeping in view the objectives of the study.
1.7.6 Statistical Tools for Analysis

The data collected for the study has been tabulated, analyzed and presented with the help of appropriate tools of analysis. Both descriptive and inferential statistics like percentage, average, weighted mean, index method, Compound Annual Growth Rate, Standard Deviation, Co-efficient of Variation, Chi-square test and Trend analysis by using method of least square are used for analysis. Graphical representation was also used wherever necessary. Weighted mean score was applied to determine the relative order of preference of the respondents. Co-efficient of variation was used to ascertain the consistency in international air cargo traffic in Kerala. It was also used to ascertain consistency of each airlines regarding air cargo traffic. Compound Annual Growth Rate was used to find out the rate of growth of cargo traffic during the reference period, Chi-square test was applied to examine the significant variations in the opinion among the respondents in the three airports in Kerala with regard to logistics facilities. Trend analysis by using method of least square was used for calculating trend value of international air cargo traffic in Kerala for the purpose of demand forecasting of air cargo traffic. For this purpose the regression equation \( y = a + bx \) was used.

1.7.7 Period of Study

The present study has gathered secondary sources of information related with imports and exports of cargo for the past six years (from 2006-2007 to 2011-2012.) This period is relevant because Calicut airport went international airport in 2006. Primary survey of freight forwarders was conducted from July to December 2012.
1.8 Operational Concepts and Definitions

What follows is a list of operational definitions of important terms and concepts of the study.

**Air Cargo**: Any property, freight, mail or express carried or to be carried in an aircraft, other than the baggage or property which is incidental to the carriage of passengers. In this thesis the terms ‘air cargo’ refers to the transaction of goods by air on a commercial basis including baggage.

**Air Cargo Complex/Terminal**: It is a place where cargo is aggregated/segregated and export/import of cargo takes place. Adequate warehouse facilities in the air cargo complex are crucial in cutting down on logistics costs.

**Air Cargo Logistics**: Using aircrafts and warehouse facilities for the transport of goods quickly from point of origin to point of consumption for satisfying the requirements customers

**Air freight**: In this thesis the term air freight used interchangeably with air cargo.

**Air Way Bill**: An Air Way Bill (AWB) is a contract between the shipper and airline (carrier) that states the terms and condition of transportation. It is a receipt issued by an international airline for goods and an evidence of the contract of carriage.
All freight carrier (Freighter) and Combination carrier: All freight carrier means carrier which is used only for cargo movement. Combination carriers usually ship cargo in the belly hold of an airplane. The belly is the space under the cabin (the lower deck) where baggage, mail and cargo can be stored.

Bonded Warehouse: It is a warehouse where goods are stored without customs duties being paid until they are removed from the warehouse.

Consignee: Any person whose name appears on the transport documents as the party to whom the goods are to be delivered by the carrier.

Consignor: Any person by whom or in whose name or on whose behalf the goods are actually delivered to the carrier in relation to the contract of carriage.

Consolidation: It is the process of putting many small lots of consignments into one lot and then tender to carrier for forwarding by the freight forwarding for the purpose of handling small lot of consignment efficiently and competitively in the international trade. Consolidation is of two types: inbound consolidation from vendors is called make bulk consolidation and outbound consolidation to customers is called break bulk consolidation. Consolidation reduces transportation cost to the shipper so that logistics costs also decrease.

Demurrage: A charge raised for detaining cargo for a long period in the warehouse than provided for in the tariff.
**Dwell Time:** It is the waiting time for the cargo clearance at the airport. It is the amount of time required to process the paper work for the release/intake of cargo and is the difference between cargo departure time and arrival time in the airport.

**E- Freight:** An IATA programme which cuts back on physical documentation flow resulted in reduction of costs.

**Electronic Data Interchange System (EDI):** EDI refers to the exchange of machine-readable data in a standard format between one company’s computer and another company’s computer. The result is a paperless transaction. The benefits of EDI are quick access to information, better customer services, reduced paper work, better communication, increased productivity, cost efficiency, substantial savings in warehousing operations and delivery costs, and competitive advantage and improved bill management.

**Freight Forwarders:** Freight Forwarders are the brokers or middleman that do not operate aircraft, but receiving a consignment of freight from a shipper, arranging it’s routing, transportation handling and documentation and may operate distribution centres that store incoming shipments and then send them on to final recipients. Freight Forwarders do not operate aircraft, but provide air cargo services.

**General Cargo:** General Cargo also referred as Non Perishable cargo, includes of machineries, electronic equipments, engineering products, textile items such as ready-made garments, spices etc.
**Integrators:** Integrators are the agents who oversee the entire cargo movement process and act as the forwarder and the carrier. The agents have either own flight or rented flight.

**Perishable cargo:** In this study perishable cargo include vegetables, fruits, fish and meat, flowers, newspaper, sea food and others.

**Shippers:** Shippers are the owners of air cargo items and may be either individuals or businesses.

**Unaccompanied Baggage (UB):** It includes electronic equipments like computers, Television, Washing Machines, Fridge, Air Conditioners bring by Gulf malayalys

**Valuable:** Valuables include foreign currency, gold jewellery and silver.

### 1.9 Limitations of the Study

1. Trade logistics covers a wide range of logistics activities. However, the study is concentrated only on transportation, freight forwarding, and warehousing and customs clearance activities.

2. As most of the freight forwarders were reluctant to disclose material facts, the available data is more regarded as estimates.

3. The period of the study is limited to six years from 2006-’07 to 2011-‘12.

4. Domestic air cargo traffic is excluded from the study.

In spite of the above limitations, all efforts have been made to ensure correctness in the data collection.
1.10 Presentation of the Report

The study report is presented in seven chapters:

Chapter 1 : Introduction

Chapter 2 : Logistics Management and Air Transport-An Overview

Chapter 3 : Performance of International Air cargo Traffic in Kerala - An Analysis

Chapter 4 : Logistics services rendered by Freight Forwarders in International Airports in Kerala- An Assessment

Chapter 5 : Management of Logistics activities in Bonded Warehouses in air cargo traffic in Kerala - An Analysis

Chapter 6 : Findings, Conclusions and Suggestions
Chapter-1

Introduction

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