

Influential Factors for Location Decisions of International Business Ventures for Logistics Hub Operations: The Case Study of Sri Lanka.

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Master of Business Administration in Supply Chain Management



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ABSTRACT

Sri Lanka is strategically located in the middle of the East-West main shipping lane has the right location to operate as a Regional Logistics Hub. Due to the location advantage, ever since in the history, country was an attractive destination for the sailors and international traders as a transit point. After the independence in 1948, various governments appointed took many initiatives to develop Sri Lanka as regional commercial, manufacturing, and logistics hub. The thirty years of civil war hindered the progress of developing the country and discourage the foreign investment. Government attention was diverted towards protecting the nation from terrorist activities. During this period, internationally, manufacturing bases started moving from West to East looking for low cost of factors of production. International shipping was boomed with sourcing raw materials and supplying the finished goods all over the world. Countries like Hong Kong, Singapore, Dubai capitalized on the geographical location advantage to support the growing international trade by developing as regional logistics hubs. Thereby achieved the commercial and financial objectives. After the independence in Sri Lanka, many initiatives were taken to develop the country as a regional logistics and commercial Hub. Expansion of Colombo Port, establishment of Free Trades Zones, construction of Hambantota port and Matthala International Airport, introduction of Commercial Hub Regulations to facilitate the regulatory reforms are the initiatives taken by the government. In reviewing the statistics of Sri Lanka comparing to the other well performing logistics hubs for the post war ten years period, Sri Lanka is still the lowest performing county as a regional logistics hub even though Colombo port was leading in the region in the past. Regardless of the location advantage and the improvements done in varies sectors to attract international trade, Sri Lanka is still not given the first preference by the international business ventures to operate their regional logistics activities. Therefore, the focus of this research is to identify the factors prioritized by the international business ventures to locate their regional logistics hubs and benchmark Sri Lanka against the well performing Logistics Hubs to identify the areas for the improvements.

Based on the literature review conducted; the influencing factors identified as decision-making criteria for deciding the location for the regional logistics hub is categorized under five main areas as follows.

- a) Location related factors,

- b) Port facilities, Air / Sea connectivity related factors,
- c) Business friendly legislation related factors,
- d) Operating cost related factors,
- e) Quality of the infrastructure related factors.

According to these factors, survey is conducted to capture the primary data from a sample of the selected population to identify the influential factors for location decision and benchmark Sri Lanka against the successful regional logistics hubs in Asia. The target population for capturing the primary data for the research is identified as the senior management experienced in the international supply chain management and regional hub operation. To assess the psychological aspects, they consider while making the decision of the regional hub location in terms of numbers, Analytical Hierarchy Process (AHP) technique is used. AHP is basically used for identifying and prioritizing the most influencing factors for certain complex decision making. Therefore, AHP technique is identified as the most suitable technique to identify the priorities given by the industry experts in deciding the regional hub location.

Based on the response to the questionnaire and the feedback received in the personal interviews, the most important factor for deciding the regional logistics hub was identified as the geographical location. At the same time, feedback reveals that industry experts have given similar high importance to the other main factors identified in the literature review. In reviewing the responses received for benchmarking Sri Lanka with the other successful regional logistics hubs, reveals the areas to be improved to bring up Sri Lanka as a preferred regional logistics hub.

In conclusion, as per the facts gathered in the literature review, questionnaire feedback and the personal interview responses, recommendations are provided for the improvements to be done to make Sri Lanka the most preferred regional logistics hub in the Asia.

Key words: Benchmarking, International Logistics Hub, AHP Method.

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LIST OF ACRONYMS

BOI- Board of investment

3PL – Third Party Logistics.

MCC- Multi Country Consolidation.

LSI- Liner Shipping Connectivity Index.

LPI- Logistics Performance Index.

UNCTAD- United Nations Conference on Trade and Development.

TABLE OF CONTENTS.

	Page
DECLARATION OF ORIGINALITY	ii
COPY RIGHT STATEMENT	iii
STATEMENT OF THE SUPERVISOR	iv
ABSTRACT	v
ACKNOWLEDGEMENT	vii
LIST OF ACRONYMS	vii
CHAPTER 01 – INTRODUCTION	01
1.1 Background	01
1.2 Statement of the Problem	04
1.3 Research Questions.	07
1.4 Research Objectives	07
1.5 Justification of the Research Topic	07
1.6 Outline of the thesis.	08
CHAPTER 02 – LITERATURE REVIEW	09
2.1 Dry Port, Free Port concepts and Logistics Hub.	09
2.2 Sri Lankan Government initiatives to Develop the Country as Regional Logistics Hub	09
2.3 Commercial Hub Regulations in Sri Lanka.	10
2.4 Internationally used matrix to measure the logistics performance and competitiveness.	12
2.4.1 LPI (Logistics Performance Index):	12
2.4.2 LSCI (Liner Shipping Connectivity Index)	12
2.4.3 Doing Business Index.	13
2.5 Important Factors to become a Regional Logistics Hub	13
2.5.1 Importance of the Geographic Location for a Regional Logistics Hub.	13
2.5.2 Importance of Air, Sea, Land, Connectivity for a Regional Logistics Hub.	14
2.5.3 Importance of Government Industrial, Trade Policies and Free Trade Agreements (FTA's) for Regional Logistics hub.	14
2.5.4 Sea /Air Combined Transportation and Turnaround Timing.	15
2.6 Well Performing Regional Logistics Hubs in Asia.	16
2.6.1 The Strengths of the Singapore as Regional Logistics Hub.	16
2.6.2 Hong Kong as a Hub of Global Supply Chain.	17
2.6.3 Indonesia, Lessons to Learn.	17
2.6.4 Dubai as a Regional Logistics Hub.	18
2.6.5 Malaysia became a Regional Logistics Hub by Developing Freeports.	18

2.7 Influential factors identified in the literature review to become a successful regional logistics hub.	19
CHAPTER 3 – RESEARCH METHODOLOGY	21
3.1 Introduction	21
3.2 Research Design.	21
3.3 Data Collection.	21
3.3.1 Primary Data Source	21
3.3.2 Secondary Data Source	21
3.4 Selection of Population and Samples.	22
3.3.1 Population.	22
3.3.2 Sample.	22
3.4.3 Sample Selection Criteria and Respondent Profile for Questionnaire feedback.	22
3.4.4 Sample Selection Criteria and Profile for Personal Interviews.	24
3.5 Application of Analytical Hierarchy Process (AHP)	25
3.5.1 Develop the AHP Hierarchy.	25
3.6 Questionnaire	28
3.6.1 Overview	28
3.6.2 Structure of the Questionnaire for Primary Data Collection.	28
3.6.2.1 Construct the pair wise comparison format.	29
3.6.3 Structure of the Questionnaire for personal interviews.	30
3.6.4 Implementation of the Questionnaire Survey and the Interviews.	31
3.6.5 Strategies for Error Control.	32
3.7 Data Analysis Method: Analytical Hierarchy Process.	32
3.7.1 Interview Feedback Analysis.	36
3.8 Data Collection	37
3.8.1 Primary Data Collection through online questionnaire.	37
3.8.2 Feedback Response rate	37
CHAPTER 4 – DATA ANALYSIS AND RESULTS.	38
4.1 Introduction	38
4.2 Data Analysis.	38
4.2.1 AHP analysis is done to identify the prioritizing factors for location decision of regional logistics hub.	38
4.2.2 Findings of the survey data analysis using AHP.	39
4.2.3 Respondent's rating on benchmarking Sri Lanka with the well performing regional logistics hubs based on the sub factors.	41
4.2.4 Findings of the benchmarking analysis based on the sub factors.	42
4.2.5 Personal Interview Feedback.	45
4.2.5.1 Findings base on the personal interviews	45

CHAPTER 5. CONCLUSION AND FUTURE RESEARCH DIRECTIONS.	50
5.1 Summarizing the Research Findings in line with the Research Questions and Objectives.	50
5.2 Recommendations for Improving Sri Lanka as a preferred Regional Logistics Hub in Asia.	52
5.3 Research Limitations.	55
5.4 Future Research Directions.	55
References.	56
Annexure.	58

LIST OF TABLES	
	Page
Table 1-1 Comparison of the performance of the Regional Logistics hubs in Asia from year 2009 to 2019	05
Table 2-1 Free ports and Bonded Areas nominated by the Gazette No 1818/30. 2013 to operate Commercial Hub Operations.	11
Table 2-2 Influential Factors Identified in the Literature review to Become a Successful Regional Logistics Hub.	20
Table 3-1 Sample selection criteria, weightage, and respondent profile for Questionnaire.	22
Table 3-2 Sample selection criteria, and respondent profile for personal interview.	24
Table 3-3 AHP Decision criteria- Main Factors and Sub Factors.	25
Table 3-4 Scale used for pair wise comparison.	29
Table 3-5 Format for the Semi Structured Personal Interview.	31
Table 3-6 Comparison Matrix.	33
Table 3-7 Normalized Matrix.	34
Table 3-8 Consistency Check.	34
Table 3-9 Identifying the Prioritizing Factors based on the respondent's feedback.	35
Table 4.1 AHP Calculation of geometric mean figures of all respondents' feedback	39
Table 4-2 Priorities given by the industry experts for location decision of regional logistics hub based on the data analysis using AHP technique.	40

Table 4-3 Geometric mean figures of all respondents' feedback on benchmarking Sri Lanka with other Regional Logistics Hubs	41
Table 4-4 Ratings given by the respondents benchmarking Sri Lanka with the well performing regional logistics hubs in Asia.	42
Table 5-1 Comparison of prioritizing factors for deciding the Regional Hub Location and ratings given for the same factors benchmarking Sri Lanka against the best performing Regional Logistics Hubs.	51

LIST OF FIGURES	
	Page
Figure 1-1 International Maritime Trade by Region 2018. (Percentage share in world tonnage)	01
Figure 3-1 AHP Hierarchy	27
Figure 3-2 Format for capturing the data of benchmarking Sri Lanka with well performing Regional Logistics Hubs base on sub factors.	29
Figure 3-3 Format used for capturing the pair wise comparison data for the Main Factors to identify the priorities giving among the Main Factors	30
Figure 3-4 Main Factor pair wise comparison for the respondent feedback.	33
Figure 3-5 Values of Random Consistency Index.	35
Figure 3-6 Analyzing the respondent rating on Sri Lanka benchmarking with the other regional logistics hubs	36

LIST OF EQUATIONS	
	Page
Equation 3-1 Equation for Consistency Index	35
Equation 3-2 Equation for Consistency Ratio.	35

CHAPTER 1 – INTRODUCTION

1.1 Introduction.

Manufacturing Bases Moving from West to East

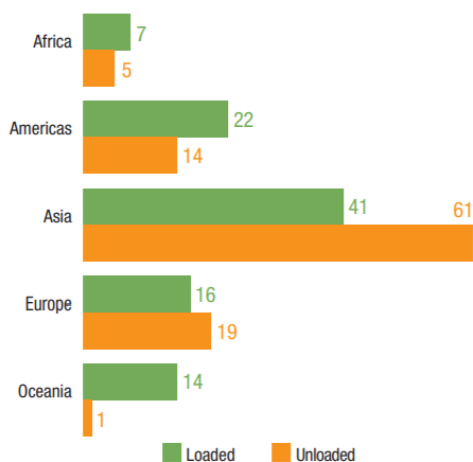
During the 17th and 18th centuries, European countries focused on the economic principals of Unilateral Benefits and Mercantilism, whereby Governments regulate the economy and trade to promote the domestic production and restrict imports (Tejvan, 2019). From 19th to the 21st century, economies divert the focus on Multilateral Benefits and Absolute Advantages to lower the cost of final products. During this period, production facilities started transferring from West to East to gain the benefits of the low-cost of factors of production such as Land, Labor, Capitol and Technology. For an example, the low cost of factors of production made the China as the second largest economy in the world in 2010. Whereas China was positioned as the nineth largest economy in the world in 1980 (Lomas, 2017).

Growth in International Maritime Trade.

More than 80% of the world cargo is moved by sea freight. As per the UNCTAD records, world maritime cargo volume grew steadily from 3.0 percent to 4.1 percent from 1970 to 2017 and reached historically high figure of 11 billion tons in 2018. A per the 2018 figures highlighted in Figure 1.1, 41% of the total goods loaded is from the Asia and 61% of the total goods unloaded were also to Asia (States, 2021).

Figure: 1.1:

International Maritime Trade by Region 2018. (Percentage share in world tonnage)



Source: (States, 2021)

Supply Chain and Logistics

Global supply chains are the networks that span several continents and nations to source and distribute products and services. The flow of information, finance and resources throughout the world is referred to as global supply chains (CIPS, 2021). Global supply chain always focusses on reducing cost of operation and an effective efficient flow of exchanging goods and services between countries. Logistics is considered as the heart of the supply chain which acts as the intermediate link to bridge the nodes of supply chain. Logistics management refers to planning, implementing and controlling the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption to meet customer requirements (Calixto, 2016). Therefore, the world's economy grows increasingly globalized and interconnected with the evolution of global logistics.

Economic Development by Logistics

Global logistics today benefits in reduced costs and rates due to lower labor and operating costs linked to the manufacturer of the products. Also, it directly contributes to supplier development since it supports specialist product offerings leading to innovations as well as sharing expertise and upgrading the market. Not only that it contributes to increasing competition of the market which result in developing new suppliers who will open up more opportunities and skills in supply routes (CIPS, 2021).

World Maritime and Aviation Network

The maritime logistics is considered as the primary means of transporting raw material, parts and finished goods on a global scale, which involve physical integration of transport modes driven by containerization and the evolving demands of end-users to achieve several different logistics goals (Song, 2009). Not only maritime, but also aviation provides critical logistics capabilities for a world economy. Therefore, aviation networks to involve in transporting cargo with the ability to fast movement of materials over great distances while improves the quality and logistics standard of businesses across the globe (Business, 2021). Both maritime and aviation networks contribute to enhancing global logistics immensely.

Logistics Hubs

Logistics hub is an important concept in world logistics aspects. A logistics hub is defined as a center or specific area designated to deal with activities related to transportation, organization, separation, coordination, and distribution of goods for national and international transit, on a commercial basis by various operators. Today's logistics hubs not only provides the traditional

activities such as storage; but also value-added logistics services such as labeling, assembly, semi-manufacturing, and customizing (Botha & Ittmann, 2008).

Singapore as a Regional Logistics Hub.

When Singapore gets the independence in 1965, it was a low income country with limited natural resources, infrastructure and investment capabilities (Ramakrishnan, 2017). Country became one of Asia's richest countries mainly due to the highest performing logistics and commercial hub in the region. This is achieved through the combination of the visionary public policies and engagement of the private sector. Singapore improves the logistics network in three key areas. Building Air and Sea connectivity, developing the infrastructure and process base on the future requirements, and encourage private sector participation. Today 20 of world top 25 logistics companies operate from Singapore. (Ramakrishnan, 2017).

Transformation of Dubai into Global Logistics Hub

The Strategic location of Dubai in the middle of the Europe and Africa with connected overland transportation infrastructure with neighboring middle east countries is considered as main favorable factor for Dubai to become a regional Logistics hub. Apart from that, focusing on developing the logistics related infrastructure, adoption of latest technology, multimodal transport connectivity, political stability of the country were the enabling factors to transform Dubai as a Global Logistics Hub (Sundarakani, 2018).

Hong Kong as a Hub of Global Supply Chain.

According to the Mark Millar, Hong Kong became a hub of global supply chain with the focus on developing the Sea and Air Connectivity taking the advantage of strategic location in the East and near to the main manufacturing bases like China. The Hong Kong Kwai Tasing container port was developed with 9 container terminals. Air Connectivity is expanded with more than 100 Airlines and direct flights to 180 destinations. (Millar, 2015)

Potentials for Developing Sri Lanka as a Regional Logistics Hub

Considering the geographical location in the middle of East-West shipping route, the port of Colombo has an exceptional advantage as a transshipment hub. More than 90% of the transshipment volume passing through the port of Colombo are from the East and West Indian coast and the Bangladesh which are emerging markets. The competitiveness of a location in terms of the seaborne trade is depending on the access to the major shipping routes, distance to the major markets and

access to the regular transport services. Therefore, it is a great opportunity to develop Colombo port as a regional transshipment hub (Hoffmann, 2012).

1.2 Statement of the Problem.

Sri Lanka is strategically located in the Indian Ocean towards the south of India, in the middle of the east and west main shipping lane. From the ancient times, the strategic location of the country was attracted by the sailors and international traders as an ideal location in the Indian Ocean. The culture of the people, trade facilitating and hospitality nature of the rulers, richness in resources, natural harbors around the country was enabling factors for traders to make the country as a preferred transit point. Therefore, the country was termed as the Pearl of Indian Ocean. (*International Trade with Lanka, from Ancient Times*, 2011)

The colonialization of Sri Lanka began in 1505 with Portuguese and ended with British in 1948. After the independence, various governments appointed focused towards developing the Colombo Sea Port, Katunayake International Airport, and Free Trade Zones with the intention of attracting the manufacturing companies, international trade, and transshipments. In the 1980s port of Colombo had a tremendous growth. In 1979, Port Authority was formed. In 1982 first Gantry cranes were installed. Jaye Container terminal was expanded from terminal 1 to 4 from 1985 to 1996. The concept of Free Trade Zone was a successful strategy initiated in 1978 with the first zone establishing in Katunayake. (Aviation, 2021) (SLPA, 2020) (BOI, n.d.) .

The Civil War in Sri Lanka started in 1983 dragged for 30 years with terrorist activities targeting civil and economic centers such as Central Bank, Katunayake International Airport and Colombo Port. During this period, the government focus was diverted towards security and protecting the nation from the terrorism. The thirty years of the conflicts was a barrier for the country to reap the benefits of the strategic location advantage. With the end of the Civil War in 2009, Sri Lanka was in a position to focus towards developing as a regional logistics hub to reap the economic benefits by capitalizing on the strategic location advantage (Ministry of Foreign Affairs, 2016).

At the end of the Civil War in the year 2009, Colombo port was the lowest performing port in the region regardless of the strategic location advantage.(TRANSPORTATION, 2013). In 2009, the government unveil the plan of establishing the five hubs concept in Sri Lanka focusing on establishing Navel, Aviation, Commercial, Energy and Knowledge Hub of the Asia under the concept of “Mahinda Chinthanaya”. (Thushari, 2014).

To have a balance growth in developing the country as a regional commercial and logistics hub, government initiated many investment projects focusing on,

- a) Developing the Colombo port,
- b) Developing Katunayake International Airport,
- c) Expanding the Free Trade Zones across the country,
- d) Invested in Hambanthota Port and Mathala Airport,
- e) Legislation reforms such as Commercial Hub Regulation was done to remove the red tapes and facilitate the Free trade through Sri Lanka.

The investment done in developing the port infrastructure, internal infrastructure such as road networks and highways, communication networks and Export Processing Zones are significant. The introduction of Commercial Hub Act paves the way for private sector companies to invest in Commercial Hub Companies to attract foreign trade through facilitating tax and duty free value adding services.(EDB, 2021)

A review of the progress and the growth of the international trade through Port of Colombo, demonstrate a significant development in terms of the cargo volume growth. The Port of Colombo was ranked as the world highest container volume growth port in the first half of 2018. (SLPA, 2020).

The Table 1-1 illustrates the comparison of performance of regional logistics hubs in Asia from 2009 to 2019 based on TEU throughput. This period covers the decade where government has given highest focus to develop Sri Lanka as a freeport and regional logistics hub after the end of civil war period in Sri Lanka.

Table 1-1:

Comparison of the performance of the Regional Logistics hubs in Asia from year 2009 to 2019.

Country	Country Land Area Sq.KM	Population In Million		Port	No of TEUs Handled in millions.		Volume in TEU Growth % comparing 2009	Port World Rank.	
		2009	2019		2009	2019		2009	2019
Singapore	725	4.9	5.7	Port of Singapore.	28.4	37.1	31%	01	02
Hongkong	1,106	6.9	7.4	Port of Hongkong	23.3	18.3	-21%	03	08
UAE	83,600	7.9	9.6	Jabel Ali	11.5	14.1	23%	07	11
Malaysia	329,847	28.5	32.6	Port Kelang	08.8	13.5	157%	13	12
				Port Tanjung Pelepas (Operations commence in year 2000)	-----	09.1		----	18
Sri Lanka	65,610	20.1	21.4	Colombo	03.4	07.2	112%	31	24

Reference: (Lloyds, 2020; TRANSPORTATION, 2013)

As depicted in the Table 1-1, the growth of volume handled through Colombo port is increased by 113% from year 2009 to 2019. The volume growth rate in port of Colombo is second only to the Malaysia in comparing to the Regional Hub Ports in Asia. The success story in Malaysia is the development of port Tanjung Pelepas in the year 2000 with the vision of giving a friendly competition to Port of Singapore. The total volume growth in Port Kelang and Tanjung Pelepas in Malaysia was 157% comparing to year 2009. In 2019, Port Thanjun Pelepas was able to attract 9.1 million TEUs while port Kelang was handling 13.5 million TEUs. (WEI, 2020a)

Singapore shows 31% growth comparing to the year 2009. The number of containers handled in the year 2019 in Singapore is 37.1 million, which is the highest throughput in a regional hub in Asia. In the Port World Rank, Singapore holds the second position. Comparing to the regional hub ports in the Asia, Singapore is on the top of the list for last ten years.

Regardless of the strategic location advantage to the Sri Lanka, after ten years of the government focus, investment in developing the infrastructure, Sri Lanka is having the lowest container throughput as a Regional Logistics Hub. As per the measuring and ranking tools used currently, the efforts of converting Sri Lanka to a regional logistics hub were not able to bring out the required level of results. The higher volume growth rate showing in the volumes handled through the port of Colombo is mainly due to recent developments in the port of Colombo and the increase in the transshipment volume for Bangladesh and India.

With the introduction of Commercial Hub Regulations, government has facilitated the private companies to operate Entrepot Trade, Offshore Business, Front End Services, Headquarter operations and Logistics Services to the client abroad. All these services are exempted from Customs duties, taxes, Customs Ordinance, Import Control Act, Exchange Control Act (EDB, 2021). These regulatory reforms were done to attract the Foreign Companies to Sri Lanka to operate their regional hubs. Reference to the statics given, Sri Lanka is still not considered as choice of preference by the international business ventures to position their regional logistics activities comparing to the other regional hubs in Asia such as Singapore, Malaysia and UAE. Therefore, it is worth researching in this area to identify the reasons for Sri Lanka falling behind other successful logistics hubs in the region. Further, to increase the chances of international business ventures selecting Sri Lanka as a regional logistics hub, studies to be done to identify the factors influencing the selection of a location for a regional logistics hub.

1.3 Research Questions.

RQ 1: What are the main factors influences the international business ventures to select a location as a Regional Logistics Hub?

RQ 2: What is the position of Sri Lanka as a regional logistics hub comparing with the other established logistics hubs in Asia in terms of the factors identified in RQ1?

1.4 Research Objectives

The main objectives of this research are to,

RO1: Identify the influential factors considered for location decisions of international business ventures for logistics hub operations.

RO2: Identify how the international business ventures considering in prioritizing the influential factors while making decision on the most suitable location for their international logistics hub operations.

RO3: Benchmark Sri Lanka as a preferred regional logistics hub in Asia with respect to identified factors.

1.5 Justification of the Research Topic

Identifying influential factors considered for location decisions of international business ventures for logistics hub operations and benchmark Sri Lanka against well performing regional logistics hubs is not an area widely researched. Therefore, it is considered worth researching on the topic “Influential Factors for Location Decisions of International Business Ventures for Logistics Hub Operations: The Case Study of Sri Lanka.” as it is a widely spoken subject of national interest. The findings of this research will facilitate to identify the gaps in terms of the expectation of the interested parties to develop Sri Lanka as a regional logistics hub in benchmarking with the well performing hubs in Asia. Based on the findings of this research, government policy makers, the decision makers in the private sector Commercial Hub operating companies, international freight forwarders and 3PL service providers in Sri Lanka will be able to use the information in their strategic planning activities to attract more international business to Sri Lanka. Accordingly, future researchers will be able to do further research in this specific area to support the vision of the nation to make Sri Lanka the most preferred international logistics hub in the Indian Ocean.

1.6 Outline of the thesis

This thesis is structured as follows.

Chapter 1 covers the background of the research with the importance of the strategic location of the Sri Lanka. The opportunities, commercial and economic benefits can be achieved by developing the country as a regional logistics hub, research questions and the objectives to be achieved.

Chapter 2 covers the literature review, detailing the concepts of regional logistics hubs, action taken by Sri Lanka to develop the country as a regional logistics hub, action taken by the countries of successful regional logistics and identifying the factors favoring the international ventures to choose a location for regional logistics hub.

Chapter 3 covers research methodology applied to gather the primary data through the questionnaire and the personal interviews for identify the prioritizing factors for the location decision of the logistics hubs and application of the AHP methodology and factor rating method.

Chapter 4 covers the data analysis based on the primary data gathered using the AHP techniques, factor rating method and findings of the research.

Chapter 5 Covers the conclusion of the research. Research Question, meeting the research objectives and based on the findings of the research, recommendations for developing Sri Lanka as a regional logistics hub.

CHAPTER 02 - LITERATURE REVIEW.

2.1 Dry Port, Free Port concepts and Logistics Hub.

Dry Port is an inland Clearance Depot, with public authority status, supported with fixed installations, facilitating handling and temporary storage of any kind of goods including containers, carried under customs transit by using any kind of inland transport mode. Dry ports are fully under the customs control for clearing goods for home use, re-export and multimodal transportation. (Jaržemskis & Vasiliauskas, 2007).

Freeports: or zones are a designated area by the government with little or no tax to encourage economic activities. Even though the freeports are located within the geographical area of the country, they are considered as outside territory for the tax purpose. Companies operate within the freeports can benefit from deferring the taxes until the products are re-exported or completely avoid paying the taxes if the products are imported just for storage or manufacturing and re-export purpose (Partington, 2019).

The Dry port concept is focus more towards supporting the ports for handling the high volumes and Freeport concepts focus towards supporting the economic activities.

Regional Logistics Hub: Is a location facilitating the free and efficient movement of goods in and out of that territory, through improved Air, Sea, Land connectivity, business friendly regulations, infrastructure, high level of service quality and value addition on commercial basis by various operators (Haughton, 2013).

2.2 Sri Lankan Government initiatives to Develop the Country as Regional Logistics Hub.

Successive governments in Sri Lanka embarked on several transport and logistics sector development projects in maritime, aviation and road sector to enhance the logistical capabilities the country. The development plans initiated in the port of Colombo since 1979 was able to set stage wise milestones in terms of handling capacities up to 5.5 million TEUs by 2018 (Sri Lanka Ports Authority, 2021). At present, the port development plans are underway to reach 10 million TEUs by 2035 (Sri Lanka Port Authority, 2019). In addition to Colombo port development, a greenfield port was constructed in Hambantota with the objective of establishing industrial port zone. The Hambantota port construction commenced in January 2008 and the first phase of the port was opened on 18th November 2010. The port Hambantota is the most strategic location in the ancient

silk route and six to ten nautical miles away from main shipping lane between east and west. In term of air transport development, Katunayake Int. Airport was initially constructed during the 2nd world war for Royal Airforce. Presently known as Bandaranayake International Airport, consisting of 3 terminals and the Cargo terminal. Presently Airport serves as the main international airport in Sri Lanka, runway capable of landing Airbus A380. The 25,000 square meter cargo terminal has the capabilities in handling general cargo, perishables, valuable cargo and live animals. (Cargo, 2020); (Aviation, 2021). A new airport in Hambanthota (MIA) was developed according to the new international greenfield airport concept, compatible with existing environment and the culture, capable of handling A380 aircrafts. The design work considered all aspect of airport operation, future expansion, phase wise development and operational requirements. The Airport was opened in March 2013 with main features including 10,000 Square meter passenger terminal, capability of handling one million passengers per annum, cargo terminal area 1,000 square meters and 35-meter-tall air traffic control tower. Along with port and airport sector development, developing Export Processing Zones (EPZ) was initiated with the objective of establishing export-oriented industrialization. Katunayake FTZ was the first export processing zone established in 1978. Since then, 11 Export Processing Zones were established across Sri Lanka providing required infrastructure and regulatory facilities for the foreign investors (BOI, n.d.).

In term of trade facilitation, the passing of the Financial Act-Commercial Hub Regulation No 1 of 2013 was a key directive. Considering the limitations in the Colombo Port to provide the value-added activities and consolidation services, the Commercial Hub Act was introduced in year 2013 under the Gazette notification No 1818/30 by amending the Financial Act no 12 of 2012. As per the Commercial Hub Act, private sector was given the license to operate commercial hubs under three investment categories. The companies incorporated under the Commercial Hub Act are authorized to carry on international trade services such as, Entrepot trade, Offshore business, Front end serves, Headquarter operations and Logistics services to client aboard.

2.3 Commercial Hub Regulations in Sri Lanka.

The Government of Sri Lanka has introduced series of legislations facilitating the commercial hub operations to gain the advantages of the strategic location of the country considering the increasing shipping volume internationally. With the introduction of the Commercial Hub concept in Sri Lanka, companies were facilitated to import raw materials, finish goods and trading materials, exceptionally for re-export purpose. Further, with minimum Customs intervention through green channel facilitates, smooth movement of goods for simple storage and value-added activities were facilitated to manage complex supply chain solutions in regional as well as global scale (EDB,

2021). Freeports and Bonded areas are defined in the Finance Act no 12 of 2013 which are geographically located inside Sri Lanka but are legally considered outside its customs territory. Materials importing from foreign countries to these bonded areas and exporting to foreign countries are given 100% duty and tax-free concessions. Three freeport and three bonded areas are nominated under the gazette to operate the International Commercial Hubs are mentioned in the Table 2-1.

Table 2-1: Free ports and Bonded Areas nominated by the Gazette No 1818/30. 2013 to operate Commercial Hub Operations.

Free ports	Bonded Areas & Free Zones
Colombo port.	Katunayake FTZ.
Hambanthota Port.	Koggala FTZ
Mathala Airport	Mirrijawila FTZ.

The Act approved five business activities under the Commercial Hub Regulations.

- a) **Entrepot Trade** – Import minor processing and re-export.
- b) **Offshore Businesses**- Goods produced or procured in one country directly exported to another country without bringing into Sri Lanka.
- c) **Front End Services**- Supply Chain Management, Marketing and Sales, Business Development, Product design, Sampling, Testing, Quality checking for international companies by locating in Sri Lanka.
- d) **Head Quarters Operation**: International Billing, Quality Control, Financial Services, Administration Services for the international companies by locating in Sri Lanka.
- e) **Logistics Services**: Warehousing, Inventory management, Logistics value addition, Freight Forwarding, Transshipment activities for the international businesses.

The Act provides an investment criterion to establish companies under the Commercial Hub Act. A commercial hub company has to be a new enterprise incorporated in Sri Lanka with at least 65% of the total investment is transferred from a foreign country in foreign currency. The Act stipulates that a minimum investment required for a new enterprise engaged in entrepot trade shall be a minimum of USD five (5) million invested in fixed assets within six months from signing the agreement with the BOI. Further, such companies will be entitled to operate all five business activities listed above. In addition, there is a minimum investment required for a new enterprise engaged in logistics services and that shall be a minimum of USD three (3) million invested in fixed assets within six months from signing the agreement with BOI. Further a minimum investment required for a new enterprise engaged in the business activities related to offshore businesses, front

end services and headquarters operation shall be a minimum of USD one (1) million invested in fixed assets within six months from signing the agreement with BOI.

Companies engage in Entrepot Trade and Logistics Services are required to establish in a Free port or Special Bonded area listed in the Table 2-1. However, companies engage other activities above may be established in outside Free port or Special Bonded areas. More importantly, as financial, and regulatory benefits offered under the Commercial Hub Act, the companies operating under the Commercial Hub Act are exempted from the provisions of the Customs Ordinance (Subject to restrictions and prohibitions imposed under “Schedule B”), the Exchange Control Act and the Import and Export Control Act.

Refer Annexure 1 for Commercial Hub Regulation No1 of 2013.

2.4 Internationally used matrix to measure the logistics performance and competitiveness.

2.4.1 LPI (Logistics Performance Index):

The Logistics Performance Index is the tool used by the World Bank to measures the competitiveness of the logistics performance of the countries based on six criteria as mentioned below (The World Bank, 2018).

- I. Efficiency of the customs and border clearance.
- II. Quality of the trade and infrastructure.
- III. Ease of arranging competitively priced shipments.
- IV. Competence and the quality of the logistics services offered.
- V. Ability to track and trace shipments.
- VI. Frequency of shipments reaching the consignee within the scheduled timelines.

2.4.2 LSCI (Liner Shipping Connectivity Index)

United Nations Conference of Trade and Development (UNCTAD) has developed the Liner Shipping Connectivity Index (LSCI) as a measuring index to monitor the level of competitiveness and supply of liner shipping services between the countries. UNCTAD considers five factors to measure the LSCI of a country as mention below (Hoffmann, 2012).

- I. Deployment of number of container ships by shipping lines.
- II. Container (TEU) capacity deployed by the lines.

- III. Number of Shipping companies providing services.
- IV. Number of Line services provided.
- V. Maximum ship capacity deployed for the service.

2.4.3 Doing Business Index.

Doing Business is an index issued by the World Bank, measuring the performance of the economies on opening a business, getting a location, accessing finance, dealing with day -to-day operations, and operating in a secured business environment. While calculating the Doing Business Index, the strengths of the economies is ranked on the ten areas.(The World Bank, 2020)

- I. Starting a Business
- II. Dealing with Construction Permits.
- III. Getting Electricity.
- IV. Registering Property.
- V. Getting Credit.
- VI. Protecting Minority Investors.
- VII. Paying Taxes.
- VIII. Trading Across Borders.
- IX. Enforcing Contracts.
- X. Resolving Insolvency.

The point number 8, Trading Across borders is covering the logistics related activities. Under this point measure the time and cost associated with three procedures covering, Documentary Compliance, Border Compliance and Domestic Transportation.

In reviewing the currently used matrices, it is noted that all the factors relating to the benchmarking techniques for a county as a Regional Logistics hub is not widely covered. Therefore, this research aims to identify all the factors important to benchmark a location as a regional logistics hub.

2.5 Important Factors to become a Regional Logistics Hub

2.5.1 Importance of the Geographic Location for a Regional Logistics Hub.

In many related literature, geographic location is given the highest importance for become a successful regional logistics hub. Location is an inherited factor enabling to become a regional hub providing the competitive advantage of easy access to the main shipping routes, industrial markets,

manufacturing bases and factors of production. Hong Kong took the geographical location advantage of being near to China, one of the largest manufacturing bases in the world, to become a global logistics hub (Kong et al., 2016). Infrastructure availability, proximity to markets, land availability, government support and labor supply also considered as factors affecting the location of a regional logistics hub (Consulting & Management, 2013). Strategic location of Dubai in the middle of Europe, South Asia and Africa connected with neighboring Middle East markets has enabled Dubai to become a regional logistics hub (Sundarakani, 2018).

Sri Lanka possesses the essential geopolitical advantage to become a key logistics hub in South Asia by being located in the middle of East-West trade route and neighboring India (Finnigan, 2019). Geographic location provides the advantage of speed to market. Location of Sri Lanka has the unparalleled speed to Europe's main markets. New York can be reached within 22 days. Dubai and Singapore, major shipping ports can be reached from Sri Lanka within 4.5 days (Finnigan, 2019).

2.5.2 Importance of Air, Sea, Land, Connectivity for a Regional Logistics Hub.

The Air, Sea Land connectivity plays the major role in developing a regional logistics hub and the hub port. When the connectivity increased, it brings the economies of scale for the transshipment cargo as well as general cargo moved through the port to economies the freight rates. Further, the high frequency of connectivity reduces the waiting time for transshipment cargo to get connecting vessels or flights to other destinations (Wilmsmeier et al., 2011). Through Singapore, high frequency of the connectivity has allows goods and passengers to reach their destinations faster and cost effectively (Ramakrishnan, 2017). Hong Kong became a Global Hub of Supply Chain with sea connectivity more than 20000 vessels per annum and 550 destinations worldwide. Air connectivity with more than 100 airlines connecting to 180 destination (Millar, 2015). Multimodal transport connectivity developed in Dubai connecting the Jabel Ali Port, Dubai International Airport and the neighboring GCC countries enabled Dubai to be a regional logistics hub (Sundarakani, 2018).

2.5.3 Importance of Government Industrial, Trade Policies and Free Trade Agreements (FTA's) for Regional Logistics hub.

Business organizations can gain the advantage of Industrial and Trade Policies, Free Trade Agreements signed with different countries by the governments by establishing the business in these countries. Through the Industrial and trade policies, business gets the tax benefits, infrastructure facilities, startup facilities and access to other international markets. More countries signing bilateral FTA's with Singapore has resulted in increasing direct shipment with those countries (Tan

& Hilmola, 2012). Singapore has more than 15 FTA's signed between single trade partnering countries and 11 FTA's with group of trade partnering countries (Logo, 2021).

Hong Kong has been actively engaged in developing the FTA's with mainland China and other international markets in order to gain favorable conditions for the goods made in Hong Kong. Hong Kong has signed eight FTA's with different countries to improve the international trade. (Department, 2012).

Dubai (UAE) is continuously focusing on improving the trade relationship with different economies in the world through the Free Trade Agreements for mutually beneficial relationship. UAE entered the WTO in 1996. International business through Dubai is benefited by the main FTA's such as Multi Trade Agreements with India, GCC Singapore Free Trade Agreement and GCC EFTA Free Trade Agreement (Partners, 2021).

Free Trade Agreements provides the preferential market access. Sri Lanka has already established free trade agreements with India, Pakistan, Singapore, and China. Sri Lanka a preferential access to EU markets under the GSP+ scheme (Finnigan, 2019).

2.5.4 Sea /Air Combined Transportation and Turnaround Timing.

Sea freight and the Air freight are the commonly used modes in the international trade. Sea freight is time taking but low cost, mostly used for high-volume long-distance transportation has limitations of reaching certain destination. Air freight is the champion of speed, but cost is much higher than Air freight. Sea / Air combination is used in logistics as a method of gaining the speed cost effectively in certain circumstances. Sri Lanka is an ideal destination for Sea / Air transportation facilitated with Colombo and Hambanthota Sea ports with easy access to Katunayake and Maththla International Airports. Bangladesh cargo moving from Chittagong to Europe and UAS markets take the advantage of using the Sea / Air combination via Colombo port, whereby reduces the transit time from 25 days to 15 days and freight cost is reduced by 25% comparing to direct airfreight cost from origin to destination. Dubai, Hongkong and Singapore are the leading giants of Sea/Air combination transportation facilitators with improved and efficient port facilities and supporting procedures. Even though Sri Lanka has the location advantage being position in the East and West for the Sea / Air combine transportation, there are certain drawbacks hinder the Sea / Air turn around timing. For example, in comparing to Dubai, Singapore and Hongkong, customs clearance procedure has more touch points in Sri Lanka and delay or no clearance in Sundays and public holidays are the setbacks. (DailyFT, 2021).

2.6 Well Performing Regional Logistics Hubs in Asia.

2.6.1 The Strengths of the Singapore as Regional Logistics Hub.

Singapore is considered as the largest transshipment hub in the world. It is mainly due to the location of the country, Air Sea connectivity, high frequency of the connectivity, major manufacturing bases nearby such as China, Malaysia, Hongkong and Taiwan. Further, the value addition and manufacturing facilities offered for the goods in transit, birth capacity of the ports and the distance from the main shipping lines to the port are the other factors influenced Singapore to become major transshipment hub (Tan & Hilmola, 2012).

As stated in the report of the Working Group on Logistics: Developing Singapore into a Global Integrated Logistics Hub, key strengths in Singapore as the Regional Logistics hub are as follows (International Enterprise Singapore with inputs from EDB, 2002).

- The physical infrastructure in the country.
- Air and sea connectivity to major manufacturing bases and the trading hubs.
- Presence of world-renowned logistics service providers and their headquarters are based in Singapore.
- Political social and economic stability in the country. Strong legal system and business friendly tax system.
- Educated workforce.
- Free trade agreements and the proactiveness of the government to get in to bilateral and multilateral agreements.

Yin Lam and Karuna Ramakrishnan identifies three main factors that have made Singapore a global logistics hub.(Ramakrishnan, 2017)

- I. **Building Connectivity:** Singapore is having a relatively small local market comparing to the other regional logistics hubs. With low domestic requirements, developing a high air/sea connectivity with hundreds of destinations is a proactive approach taken by the government. The Civil Aviation Authority of Singapore has made 130 agreements with different states to expand the Air Connectivity. Shipping Lines associated in Singapore have built one of the largest shipping networks connecting Singapore to the world destinations.
- II. **Innovative Infrastructure and Processes.** Singapore is always thinking ahead and building world class innovative infrastructure and processes to support logistics activities. Country is focusing on automation and expanding the port to handle 65 million TEUs by year 2030.

III. **Encouraging Private Sector Participation:** Singapore government encourages the private sector participation for the policy dissection making. Facilitation for the private sector to invest in logistics related infrastructure and competition created among the private sector to improve the efficiencies has made the country attractive logistics destination. Government has attracted international logistics companies to invest in Singapore by providing the tax benefits and facilitating with investment favorable climates. Thereby 20 out of best 25 world renowned logistics companies operating from Singapore (Ramakrishnan, 2017).

2.6.2 Hong Kong as a Hub of Global Supply Chain.

Hong Kong has taken the geographical advantage of its position to become one of the leading Global Logistics Hub through unparalleled international access to China. With the freeport status, government tax relaxes facilities, free flow of information, Hong Kong was able to attract 7900 international companies to operate from the country to serve China mainland and destinations around the world. With the business friendly business relationship, 320,000 small and medium enterprises were facilitated to establish in Hong Kong (Kong et al., 2016).

According to the Mark Millar (Millar, 2015), Hong Kong became a hub of global supply chain with the,

- Hong Kong Kwai Tsing Container port which became No 4 Container port worldwide with 22.3 M TEU, 9 container terminals and 24 berths. Sea Connectivity with more than 20000 vessels per annum and 550 destinations worldwide.
- Hong Kong International Airport # 1 in Cargo Handling with 4.38 M tons in 2014. Air Connectivity with more than 100 Airlines and Direct Flights to 180 destinations.
- Infrastructure developments such as Hong Kong Zhuhai Macao Bridge.
- Skill Center of Excellent and e-Logistics Leadership.

2.6.3 Indonesia, Lessons to Learn.

Indonesia identified their heavy logistics cost is mainly due to the high operating cost in the Indonesian ports and requirement of investment to improve the port efficiencies. World Bank president Jim Yong Kim during his visit to Indonesia in year 2015 pledge USD 12 Billion in financing developing the seaport and road access infrastructure to turn the county in to maritime superhighway (The World Bank, 2015).

2.6.4 Dubai as a Regional Logistics Hub.

The favorable factors identified for Dubai to be a Regional Logistics Hub are (Sundarakani, 2018),

- Strategic location of Dubai: in the middle of Europe, South Asia, and Africa with well connected to neighboring Middle East countries like Saudi Arabia, Qatar, Oman and Bahrain Kuwait and Iraq.
- Well-developed Physical Infrastructure in the port, Airport, Free zones, road network, IT infrastructure and Finance institutions establish to facilitate the trade.
- Multi model transport connectivity: Jabel Ali Port, Dubai International Airport and road network linking the United Arab Emirates and regional GCC Countries.
- Interconnected regulatory and institutional structure supporting the business and logistics activities.
- Political and economic stability encouraging the investors and business enterprises.
- Availability of blue-collar labor from South Asian countries and Africa supporting the logistics activities.
- Well facilitated Free Zones governed by Free Zone Authority with required regulatory facilities for investors and logistics activities.
- Competitive logistics cost in comparing to Singapore and Hong Kong.
- Establishment of world most competitive logistics companies.

2.6.5 Malaysia became a Regional Logistics Hub by Developing Freeports.

Malaysia has established two famous Freeports naming Port Klang Free Zone (PKFZ) and Port Tanjung Pelepas (PTP). PKFZ is a 404.69 ha duty free industrial zone attached with the port to support the manufacturing and distribution of materials regionally on duty free basis. PTP is mainly developed with the vision of providing friendly competition to Singapore. In 2019, PTP was able to handle 9.1 million TEUs providing thoroughly friendly competition to the other nearby regional ports (WEI, 2020b).

2.7 Influential factors identified in the literature review to become a successful regional logistics hub.

Reference to the literature review conducted, the favorable and influential factors for being a successful regional logistics hub are summarized and listed under five main categories. The sub factors listed under the main factors are covering the insight details of the main factors.

Table 2-2:

Influential Factors Identified in the Literature Review to Become a Successful Regional Logistics Hub.

Main Factors	Sub factors and literature reference.
I. Location	Easy access to the main shipping routes. Access to the nearby main markets. Availability of regional and local production facilities. (Tan & Hilmola, 2012), (Kong et al., 2016), Sundarakani, 2018), (Finnigan, 2019), (Consulting & Management, 2013)
II. Air / Sea connectivity Port facilities and operation efficiencies	Efficiency in loading unloading and container discharge. Number of Terminals & capacity. Water depth in the port terminal / Runaway capacity. Major shipping line / Airline connectivity. (Tan & Hilmola, 2012), (International Enterprise Singapore with inputs from EDB, 2002), (Wilmsmeier et al., 2011), (Ramakrishnan, 2017), (Kong et al., 2016), (Kong et al., 2016)
III. Good governance, Business friendly legislations, rules, and regulations in the country.	Government support and business friendly policies for the MCC and transshipment operations. Political stability and consistency in applied regulations. Business friendly tax policies. Financial policies facilitating free transfer of capital and profit in and out of the country. Application of intellectual property protection laws. (International Enterprise Singapore with inputs from EDB, 2002), (Ramakrishnan, 2017), (Kong et al., 2016), (Kong et al., 2016)
IV. Logistics Operating Cost	Port Charges, handling, and operational cost at the port. Transportation cost from port to the fulfilment center.

	Labor, handling, storage, and operating cost at the fulfillment center. (Wilmsmeier et al., 2011), (The World Bank, 2015), (Kong et al., 2016).
V. Quality of the infrastructure in the Airports, Sear Ports, main infrastructure in the country and quality of the work force.	Quality of the infrastructure at the Seaports and Airports. Quality of the main infrastructure at the country. Quality of the facilities offered by the private sector service providers. Quality of the people performing the work (International Enterprise Singapore with inputs from EDB, 2002), (Ramakrishnan, 2017), (Millar, 2015), (Kong et al., 2016).

CHAPTER 3 - RESEARCH METHODOLOGY

3.1 Introduction

Based on the literature review, influencing factors to become successful regional logistics hubs are identified. According to the objectives of the research, it is required to identify the priorities given by the industry experts for the identified factors while selecting a regional logistics hub for their international trade. Further, in line with the research objectives, industry expert's feedback is required on how they benchmark Sri Lanka with well performing regional logistics hubs based on the identified main factors and the sub factors. Therefore, industry expert's feedback is collected from the selected sample of identified population. In this chapter, methods applied to collect the primary data, population and the samples selected, methodology used for analyzing the data is elaborated.

3.2 Research Design.

Conducting a research on identifying the factors influencing the decision of selecting a location for a regional logistics hub is confined to a limited number of specialized populations who are experts in that area of work. Decision of this nature is based on the expert's knowledge and previous experience. Therefore, research is conducted using qualitative methods of collecting and analyzing primary and secondary data. To convert the expert opinion and psychological factors into numbers for ranking and making the analytical decisions, the Analytical Hierarchy Process (AHP) method is selected (Taherdoost, 2017) (Chen, 2006)

3.3 Data Collection

3.3.1 Primary Data Sources

Primary data collection is done through the personal interviews with the industry experts and Research Questionnaire data collection.

3.3.2 Secondary Data Sources

Secondary Data collection is mainly from the reliable online sources.

3.4 Selection of Population and Samples.

3.4.1 Population.

Target population for the data collection includes,

- a. Investors and decision makers in an organization who are involved in the international supply chain management and manufacturing.
- b. Head of Sales in leading Freight forwarding companies covering the 3PL and MCC operation who are aware of the market trends, factors considered by the target population for regional logistics hub operations.
- c. International raw material suppliers.
- d. Supply Chain and Sourcing managers of international brands and buyers.
- e. Senior Managers representing the hub operating companies in Sri Lanka.
- f. International Trading Companies.

3.4.2 Sample.

AHP is a decision-making technique and not a statistical tool. Therefore, it is not required to have a very large sample size. 10 to 15 samples of research questionnaire feedback are considered covering the target population. Considering the limited size of the target population, four personal interviews conducted.

3.4.3 Sample Selection Criteria and Respondent Profile for Questionnaire feedback.

Table 3-1

Sample selection criteria, weightage, and respondent profile for questionnaire.

Category	Number of Samples	Weightage	Number of Respondents	Profile
Investors in International Supply Chain Management & Manufacturing organizations.	4	20%	1	Chairman of an International Supply Chain Management organization involve in international logistics operations.
			1	Managing Director International Freight Forwarding and

			1	Far East countries and supplying to India. Sourcing Manager Based in Europe, sourcing from Sri Lanka and supplying to Europe. Experienced in regional hubs in Singapore and Dubai.
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3.4.4 Sample Selection Criteria and Profile for Personal Interviews.

Table 3-2

Sample selection criteria, and respondent profile for personal interview.

Respondent	Nationality	Present Engagement and Position.	Areas of Experience
Respondent -1	Foreigner. (Requested to keep anonymous)	Shipping and Terminal operations. Above Sr. Managerial position.	+ 20 years in the shipping and logistics industry covering, Middle East, South Asia and Far East countries. Experience in dealing with Jabel Ali, Singapore and China Regional Logistics Hubs
Respondent-2	Japanese	International Freight Forwarding Chain as a Sr. Manager.	+ 20 years of experience in shipping industry, freight forwarding, customer service and handling international cooperate accounts. Working experience in related field in Indonesia, Singapore, Japan, Hong Kong, India, and Sri Lanka.
Respondent-3	Maldivian	Entrepreneur, engage in trading activities in India, Sri Lanka and Maldives. Head office based in Singapore.	15 years of international trading experience. Sourcing from Far East countries and supplying to Maldives, India and Sri Lanka through Singapore.
Respondent-4	Sri Lankan	Regional Head RM Supply in South Asia. Top management Level.	+ 30 years of international shipping, transportation, and logistics industry experience. Regional distribution of raw materials for apparel industry. Attached to European Multinational Company having manufacturing facilities in Europe, South America, and China

3.5 Application of Analytical Hierarchy Process (AHP)

AHP is a Multiple Criteria Decision-Making Process which is based on two areas, that is mathematics and psychology. It was developed in 1970 by Dr. Thomas L Saaty. AHP Method is mainly used for two types of application.

- a) Taking a decision on selecting the best alternative by analyzing various alternatives.
- b) Identifying and prioritizing the most influencing factors for certain complex decision making (De Felice et al., 2015).

In this research AHP technique is mainly used for the type two application mentioned above to identify the most influencing and prioritizing factors for making the decision of regional logistics hub.

3.5.1 Develop the AHP Hierarchy.

AHP involves multilevel hierarchical factors covering, objectives and decision criteria or factors, which are identified as follows for the research based on the literature review.

- **Objectives** – To identify the prioritizing factors of international business ventures for location decision for regional logistics hub.
- **Decision criteria**- Main Factors and Sub Factors.

Table 3-3:

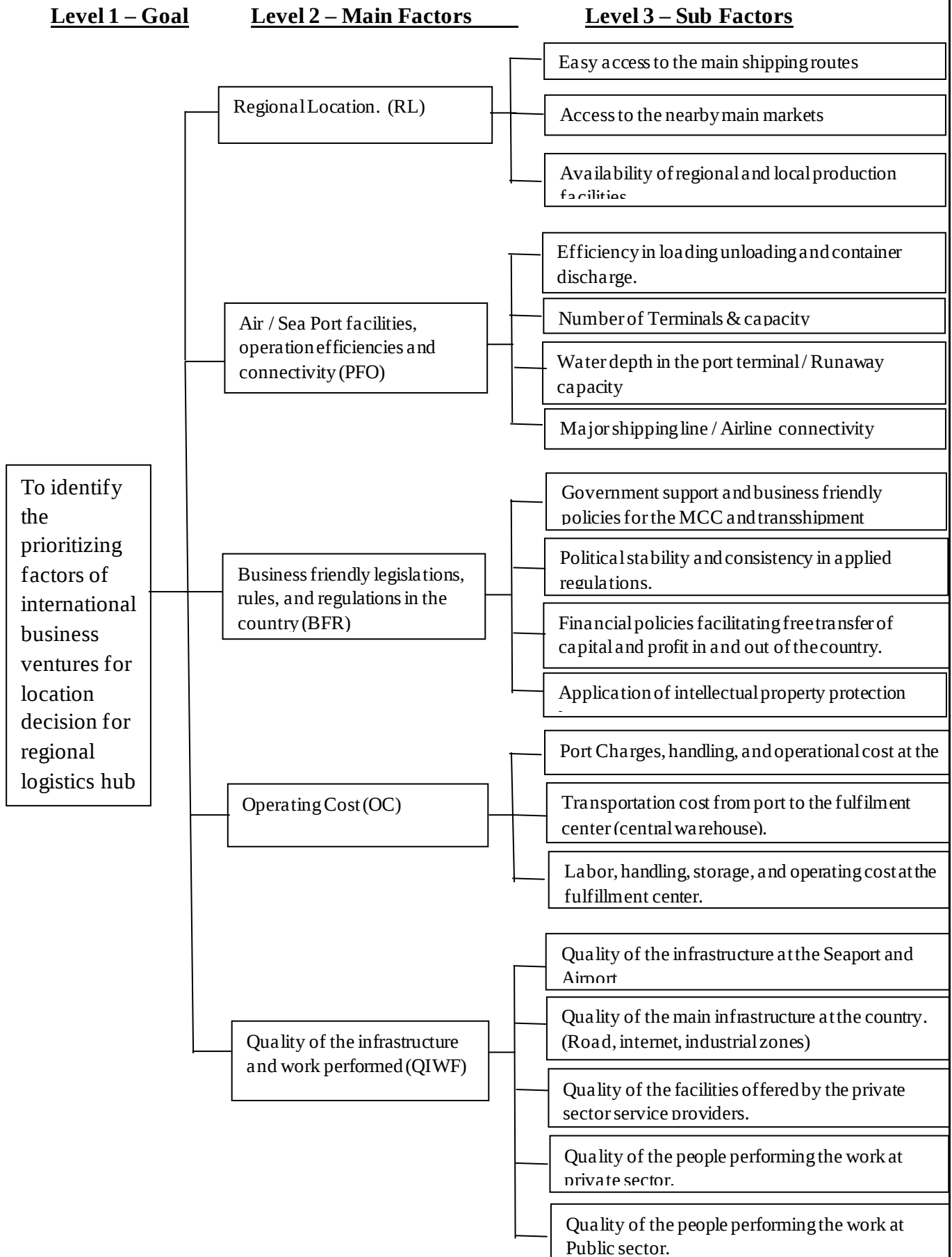
AHP Decision criteria- Main Factors and Sub Factors.

Main Factors	Sub Factors
1. Regional Location (RL)	I. Easy access to the main shipping routes. II. Access to the nearby main markets. III. Availability of regional and local production facilities.
2. Air / Sea Port facilities, operation efficiencies and connectivity (PFO)	I. Efficiency in loading unloading and container discharge. II. Number of Terminals & capacity. III. Water depth in the port terminal / Runaway capacity. IV. Major shipping line / Airline connectivity.
3. Business friendly legislations, rules, and regulations in the country (BFR)	I. Government support and business friendly policies for the MCC and transshipment operations. II. Political stability and consistency in applied regulations. III. Business friendly tax policies. IV. Financial policies facilitating free transfer of capital and profit in and out of the country. V. Application of intellectual property protection laws.

4. Operating Cost (OC)	I. Port Charges, handling, and operational cost at the port. II. Transportation cost from port to the fulfillment center (central warehouses). III. Labor, handling, storage, and operating cost at the fulfillment center.
5. Quality of the infrastructure and work performed (QIWF)	I. Quality of the infrastructure at the Seaports and Airports. II. Quality of the main infrastructure at the country. (Road, internet, industrial zones) III. Quality of the facilities offered by the private sector service providers. IV. Quality of the people performing the work (Private & Public Sector).

Figure: 3.1:

AHP Hierarchy.



3.6 Questionnaire Development.

3.6.1 Overview

The purpose of the questionnaire is to understand the most influencing factors of location decision for regional logistics hub operation by industry experts in international business ventures. Further, expect to collect their feedback on how they rate Sri Lanka as a regional Logistics Hub, based on their experience and exposure on international logistics hub operations.

Considering the sample selection from the senior management of the organizations, personal interview and questionnaire is compiled to get their feedback within minimum timespan covering the entire spectrum.

3.6.2 Structure of the Questionnaire for Primary Data Collection.

Based on the literature review, the scope of area considered for location decision for the regional logistics hub is summarized into five areas as main factors. Relevant to each main factor, sub factors are listed covering the important areas of the main factor as depicted in the AHP Hierarchy. Using the AHP method, respondents' feedback on prioritizing the main factors in location decision making for international logistics hub operation is analyzed. Therefore, pair wise comparison of the five main factors is included in the questionnaire to get the feedback from the respondents on the importance they give for each main factor while deciding the location for the regional logistics hub.

Benchmarking Sri Lanka with the successful regional logistics hubs is done based on the respondents' feedback on sub factors comparing with other regional logistics hubs with their experiences.

For the respondent to get an idea on the main factor and the composition of the sub factors, in the questionnaire, rating on Sri Lanka based on sub factors is listed in the beginning.

Figure 3.2:

Format for capturing the data on benchmarking Sri Lanka with well performing Regional Logistics Hubs base on sub factors.

		How do you rate Sri Lanka comparing to other Regional Logistics Hubs						
		6	5	4	3	2	1	0
Main Factors	Sub Factors	Excellent	Very Good	Good	Average	Below Average	Poor	Very Poor
1 Regional Location (RL)	I Access to the main shipping routes,							
	II Distance from the main shipping routes to the Hub Port,							
	III Access to the nearby main markets							
	IV Availability of regional and local production facilities.							
2 Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	I Efficiency in loading unloading and container discharge.							
	II Number of Terminals & capacity.							
	III Water depth in the port terminal / Runaway capacity							
	IV Major shipping line / Airline connectivity.							
3 Business friendly legislations, rules and regulations in the country. (BFR)	I Government support and business friendly policies for the MCC and							
	II Political stability and consistency in applied regulations.							
	III Business friendly tax policies.							
	IV Financial policies facilitating free transfer of capital and profit in and out of the country.							
	V Application of intellectual property protection laws.							
4 Operating Cost. (OC)	I Optimum Port Charges, handling and operational cost at the port.							
	II Optimum Transportation cost from port to the fulfillment center (central warehouse).							
	III Optimum Labor, handling, storage and operating cost at the fulfillment center.							
5 Quality of the infrastructure and work performed. (QIWF)	I Quality of the infrastructure at the Seaport and Airport.							
	II Quality of the main infrastructure at the country. (Road, internet, industrial zones)							
	III Quality of the facilities offered by the private sector service providers.							
	IV Quality of the people performing the work in the Private Sector.							
	V Quality of the people performing the work Public Sector.							

3.6.2.1 Construct the pair wise comparison format.

Pair wise comparison is used to obtain the data from the experts to determine the weights and the rankings base on the priorities assign for the main factors.

Table 3-4:

Scale used for pair wise comparison.

Intensity of Importance	Definition.
1	Equal Importance
3	Moderate Importance
5	Strong Importance
7	Very Strong Importance
9	Extremely Strong Importance
2,4,6,8	Intermediate values for compromise between the above values

When the respondent does the pair wise comparison and rank the priorities, scale 1 is given if both criteria is equally important. When the priorities get increased to one of the two criteria, the scale increases base on the importance from 2 to 9 towards left or right side of that criterion.

Figure 3.3:

Format used for capturing the pair wise comparison data for the Main Factors to identify the priorities giving among the Main Factors.

Pair wise comparison of Main Factors.

Main Factor	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Main Factor
Regional Location (RL)																		Port facilities and operation efficiencies at Air /Sea Ports (PFO)
Regional Location (RL)																		Business friendly legislations, rules, and regulations in the country. (BFR)
Regional Location (RL)																		Operating Cost (OC)
Regional Location (RL)																		Quality of the infrastructure and work performed (QIWF)
Port facilities and operation efficiencies at Air /Sea Ports (PFO)																		Business friendly legislations, rules, and regulations in the country. (BFR)
Port facilities and operation efficiencies at Air /Sea Ports (PFO)																		Operating Cost (OC)
Port facilities and operation efficiencies at Air /Sea Ports (PFO)																		Quality of the infrastructure and work performed (QIWF)
Business friendly legislations, rules, and regulations in the country. (BFR)																		Operating Cost (OC)
Business friendly legislations, rules, and regulations in the country. (BFR)																		Quality of the infrastructure and work performed (QIWF)
Operating Cost (OC)																		Quality of the infrastructure and work performed (QIWF)

3.6.3 Structure of the Questionnaire for personal interviews.

To capture the primary data, personal interview is considered as a powerful tool. Considering the senior management involve in target sample, personal interview is a vital tool to get feedback of a wider scope within a short time frame. When two people face each other, the dialog goes beyond expression. With the nature of the words, through the body language and the facial expressions, true expression of what the other party means can be captured.

Structure of the Interview: The personal interviews will be Semi Structured to gather maximum feedback from the respondent protecting their anonymity.

The Objective of Personal Interview:

To identify how the senior management at the relevant organizations rate Sri Lanka as a regional logistic hub. What are the factors reviewed by them while making decision of a regional logistics hub?

Table 3-5:

Format for the Semi Structured Personal Interview.

Date of the interview	
Respondent Nationality (Sri Lankan / Foreign)	
Experience of Work	
Presently Attached to the Industry	
Position	
Knowledge and experience in dealing with other regional logistics hubs.	
The important factors he considered for a location of a regional logistics hub.	
His / Her feeling about Sri Lanka.	
Advantages of using Sri Lanka as a Regional Logistics Hub.	
Present drawbacks to use Sri Lanka as a regional logistics hub.	
Areas need to be improved in Sri Lanka to be competitive as a regional logistics hub.	

3.6.4 Implementation of the Questionnaire Survey and the Interviews.

Survey questionnaire is electronically distributed. Questionnaire is formulated in very user-friendly manner. Expected time span for a user to complete the questionnaire is 15 to 20 minutes. The questionnaire link is shared through email. Feedback captured is transferred to MS Excel for data analysis.

Personal interviews conducted at a convenient place for the interviewee. Time durations assign for an interview is 30 to 40 minutes discussion. It is a semi structured personal interview to capture the true feeling of the respondents on their experiences and personal feelings of selecting a location for regional logistics hub operation.

3.6.5 Strategies for Error Control.

Expected errors are minimum considering the target population of the well-educated industry experts. Minimum number of respondents interviewing and limited number of questionnaires for the feedback due to qualitative nature of the data capturing, also enable further minimizing the errors.

After collecting all the feedback, data captured is reviewed in detail to identify any externalities.

In the AHP data analysis, Consistency Check is done to identify any inconsistencies in the feedback. As per the AHP method guidelines, only respondent's consistency ratio is less than 0.10 is considered as consistent data for analysis.

3.7 Data Analysis Method: Analytical Hierarchy Process.

Prepare the comparison matrices.

Data collected from each questionnaire is transformed into a square matrix. In the diagonal of the matrices place "1" along the line. Based on the respondent data, relevant cells above the diagonal line are filled. The value of the items appearing in the right-hand side of the pair wise comparison chart is mentioned as reciprocal in the comparison matrix table. The value of the items appearing in the left-hand side of the pair wise comparison chart is mentioned as it is in the comparison matrix table. Below the diagonal line of the matrix table is filled with the reciprocal of the relevant values mentioned above the diagonal line.

Figure 3-4:

Main Factors comparison for the 1st respondent's feedback.

Pair wise comparison among criteria

Criterion 1	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Criterion 2
Regional Location (RL)							1											Port facilities and operation efficiencies at Air /Sea Ports (PFO)
Regional Location (RL)						1												Business friendly legislations, rules, and regulations in the country. (BFR)
Regional Location (RL)							1											Operating Cost (OC)
Regional Location (RL)								1										Quality of the infrastructure and work performed (QIWF)
Port facilities and operation efficiencies at Air /Sea Ports (PFO)									1									Business friendly legislations, rules, and regulations in the country. (BFR)
Port facilities and operation efficiencies at Air /Sea Ports (PFO)										1								Operating Cost (OC)
Port facilities and operation efficiencies at Air /Sea Ports (PFO)											1							Quality of the infrastructure and work performed (QIWF)
Business friendly legislations, rules, and regulations in the country. (BFR)								1										Operating Cost (OC)
Business friendly legislations, rules, and regulations in the country. (BFR)										1								Quality of the infrastructure and work performed (QIWF)
Operating Cost (OC)													1					Quality of the infrastructure and work performed (QIWF)

Table 3-6:

Comparison Matrix for the Main Factors.

	RL	PFO	BFR	OC	QIWF
RL	1	3	4	3	2
PFO	1/3	1	1/2	1/3	1/5
BFR	1/4	2	1	2	1/2
OC	1/3	3	1/2	1	1/6
QIWF	1/2	5	2	6	1
	2.42	14.00	8.00	12.33	3 7/8

Prepare the normalized matrices and weights.

Normalized matrix is prepared by dividing each entry in the comparison matrix by the sum of each column in the comparison matrix. Weight for each factor is calculated by taking the average of each row.

Table 3-7:

Normalized Matrix for the 1st respondent's feedback of Main Factors.

	RL	PFO	BFR	OC	QIWF	Weight
RL		0.41	0.21	0.50	0.24	0.52
PFO		0.14	0.07	0.06	0.03	0.05
BFR		0.10	0.14	0.13	0.16	0.13
OC		0.14	0.21	0.06	0.08	0.04
QIWF		0.21	0.36	0.25	0.49	0.26

Consistency Check

To check the consistency of the Matrix.

- I. Name the comparison matrix as “A”
- II. Multiply the entire matrix “A” by the weight “W” in the normalized matrix. (Use Excel Function =MMULT (Aray1, Aray2) and create the AW column.
- III. Create the vector lamda (λ) by dividing the elements in “AW” by the corresponding “W.”.
- IV. Calculate the Lamda Max (λ_{max}) value by taking the average of Lamda values.

Table 3-8:

Consistency Check for the 1st respondent's feedback.

Main Factors Consistency Check			
AW	Lamda	CI	CR
2.07	5.47	0.10	0.09
0.36	5.14		
0.74	5.57		
0.56	5.22		
1.76	5.65		
Lamda Max		5.41	

V. Calculate the Consistency Index (CI).

Equation 3-1

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

VI. Calculate the Consistency Ratio (CR).

Equation 3-2

$$CR = CI / RI$$

RI= standard value taken from the table. (Taherdoost, 2017)

Figure 3-5:

The Random Consistency Index.

The value of Random Consistency Index,
Source: Golden and Wang (1990)

<i>Dimension</i>	<i>RI</i>
1	0
2	0
3	0.5799
4	0.8921
5	1.1159
6	1.2358
7	1.3322
8	1.3952
9	1.4537
10	1.4882

If $CR < 0.10$ then matrix is considered as consistent.

Based on the 1st respondent's feedback data, respondent has prioritized the main factors while making the decision of the regional logistics hub as follows. Highest weight is gain for the factor given the highest priority.

Table 3-9:

Identifying the prioritizing factors for the 1st respondent's feedback.

Main Factors	Weight / Priority
Regional Location (RL)	0.38
Quality of the infrastructure and work performed (QIWF)	0.31
Business friendly legislations, rules, and regulations in the country. (BFR)	0.13
Operating Cost (OC)	0.11
Port facilities and operation efficiencies at Air /Sea Ports (PFO)	0.07

The geometric mean of all the respondents' weights is taken as the cumulative figures for the research findings.

Analyzing the respondent rating on benchmarking Sri Lanka with the other regional logistics hubs.

Figure 3-6:

Analyzing the data gathered for the 1st respondent's feedback on rating Sri Lanka as a Regional Logistics Hub comparing to well performing Regional Logistics Hubs.

Main Factors	Sub Factors	How do you rate Sri Lanka comparing to other Regional Logistics Hubs							Score	Mean Score for Main Factor
		6	5	4	3	2	1	0		
1 Regional Location (RL)	I Access to the main shipping routes,	1							6	
	II Distance from the main shipping routes to the Hub Port,	1							6	
	III Access to the nearby main markets			1					4	
	IV Availability of regional and local production facilities.			1					4	5.00
2 Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	I Efficiency in loading unloading and container discharge.			1					4	
	II Number of Terminals & capacity.				1				3	
	III Water depth in the port terminal / Runaway capacity		1						5	
	IV Major shipping line / Airline connectivity.		1						5	4.25
3 Business friendly legislations, rules and regulations in the country. (BFR)	I Government support and business friendly policies for the MCC and				1				3	
	II Political stability and consistency in applied regulations.					1			2	
	III Business friendly tax policies.					1			2	
	IV Financial policies facilitating free transfer of capital and profit in and out of the country.				1				3	
	V Application of intellectual property protection laws.					1			2	2.40
4 Operating Cost. (OC)	I Optimum Port Charges, handling and operational cost at the port.		1						5	
	II Optimum Transportation cost from port to the fulfillment center (central warehouse).					1			2	
	III Optimum Labor, handling, storage and operating cost at the fulfillment center.	1							6	4.33
5 Quality of the infrastructure and work performed. (QIWF)	I Quality of the infrastructure at the Seaport and Airport.			1					4	
	II Quality of the main infrastructure at the country. (Road, internet, industrial zones)			1					4	
	III Quality of the facilities offered by the private sector service providers.		1						5	
	IV Quality of the people performing the work in the Private Sector.		1						5	
	V Quality of the people performing the work Public Sector.						1		1	3.80

Defined values are assigned for the respondents rating on sub factors. The mean score value of all the sub factors were taken as the rating for the main factors.

Geometric mean value of all the respondents' feedback on each Sub Factors is taken to analyze the overall rating of all respondents.

3.7.1 Interview Feedback Analysis.

Interview feedback capture from the industry experts are summarized in the report mentioning the profile of the respondents, their knowledge and experience in international logistics hub operations and the feedback given. The positive and negative feedback is compiled into one report to identify the strengthen and the weakness of Sri Lanka as a regional logistics hub.

3.8 Data Collection

3.8.1 Primary Data Collection through online questionnaire.

As per the formats worked out in the Chapter 3, online data collection was done to collect the respondents' feedback using a questionnaire.

Refer Annexure 2 for the online questionnaire.

3.8.2 Feedback Response rate.

	No of Respondents	Percentage
Questionnaire was circulated to	20	
No of responses received.	14	70%
No of respondent data excluded from the analysis due to inconsistency in the data as per AHP method	3	21%
No of respondent data considered for analysis	11	79%

Refer Annexure 3 and Annexure 4 for the details of the respondents' feedback and Data Analysis.

CHAPTER 4 – DATA ANALYSIS AND RESULTS.

4.1 Introduction

Based on the research methodology provided in the Chapter 3, primary data gathering is done through the questionnaire and personal interviews. The data analysis and the finding are addressed in this chapter.

4.2 Data Analysis

4.2.1 AHP analysis is done to identify the prioritizing factors for location decision of regional logistics hub.

Through the literature review, five main factors and sub factors relating to the main factors were identified as decision-making criteria for selecting the location for a regional logistics hub. Using the AHP technique, feedback gathered from the industry experts through the questionnaire were analyzed to identify the priorities given by the decision makers for each main factor while deciding the location for the regional logistics hub.

Cumulative summary figures of pair wise comparison data of all the respondents' feedback are taken for AHP analysis.

Refer Annexure 3 Respondents' feedback for the online questionnaire and data analysis. (Pair wise comparison of the Main Factors and application of AHP techniques.)

Table 4.1

AHP Calculation of geometric mean figures of all respondents' feedback.

Main Factor comparison Matrix					A
	RL	PFO	BFR	OC	QIWF
RL	1	2.03	1.20	1.46	1.59
PFO	0.49	1	1.07	1.53	1.12
BFR	0.83	0.93	1	1.07	1.08
OC	0.69	0.65	0.94	1	0.79
QIWF	0.63	0.90	0.93	1.27	1
	3.64	5.51	5.14	6.32	5.57

Main Factor Normalized Matrix and weights						W
	RL	PFO	BFR	OC	QIWF	Wight
RL	0.27	0.37	0.23	0.23	0.28	0.28
PFO	0.14	0.18	0.21	0.24	0.20	0.19
BFR	0.23	0.17	0.19	0.17	0.19	0.19
OC	0.19	0.12	0.18	0.16	0.14	0.16
QIWF	0.17	0.16	0.18	0.20	0.18	0.18

Main Factor Consistency			CR=CI/RI
AW	Lamda	CI	CR
1.42	5.08	0.01	0.01
0.98	5.05		
0.97	5.05		
0.80	5.04		
0.91	5.05		
Lamda Max	5.06		

4.2.2 Findings of the survey data analysis using AHP.

AHP analysis converts the psychological factors considered by the decision makers to the numbers. Based on these numbers, weights are calculated to identify the high priority and low priority factors. In the Table 4-2, prioritizing factors are listed on descending order base on the weight figures obtain through the AHP analysis.

Table 4-2:

Priorities given by the industry experts for location decision of regional logistics hub based on the sample data analysis using AHP technique.

Priority Given	Main Factor	Weight Obtained.
1	Regional Location (RL)	0.28
2	Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	0.19
3	Business friendly legislations, rules, and regulations in the country. (BFR)	0.19
4	Quality of the infrastructure and work performed. (QIWF)	0.18
5	Operating Cost (OC)	0.16

As per the weightage figures arrived by AHP analysis, the geographic location is given the highest priority while the industry experts consider choosing a regional logistics hub for their international business ventures. Even though the factor RL is given the highest priority, total weightage given is only 28%. The rest of the other four factors also given considerably higher priority and weightage. Factor PFO and BFR are given equally higher priority of 19%. Factor QIWF is given almost same weightage of 18%. Factor OC is given 16%.

As per the AHP results achieve by this research, geographic location was the first consideration given by the international business ventures for their regional logistics hub location decision. But the geographical location is not given an extremely higher weightage. The other four factors also considered as equally important factors for the location decision. Therefore, the results shows that the geographical location advantage is not the only important factor and the other four main factors such as, Port facilities and connectivity, Business friendly regulations in the country, Quality of the infrastructure, quality of the work performed, and the Operating cost also given considerably higher priority for location decision making for regional logistics hub. When align the outcome of the data analysis with the findings of literature review, countries like Singapore, Hong Kong, and Dubai, have become attractive regional logistics hubs due to their focus on continuous improvement on the other four main factors. Therefore, the attractiveness of the other four criteria to the international business ventures have become the decision-making factors when comparing with the countries having equally important location advantages.

4.2.3 Respondent's rating on benchmarking Sri Lanka with the well performing regional logistics hubs based on the sub factors.

Please Refer Annexure 4 for the data collected and analysis of the respondents' feedback on benchmarking Sri Lanka with the well performing Regional Logistics Hubs.

Table 4.3

Geometric mean figures of all respondents' feedback on benchmarking Sri Lanka with other Regional Logistics Hubs,

Main Factors		Sub Factors		Mean score for Sub Factors	Overall Rating for Sub Factor	Mean score for Main Factor	Overall Rating for the Main Factor
1	Regional Location (RL)	I	Access to the main shipping routes,	5.80	Very Good		
		II	Distance from the main shipping routes to the Hub Port,	5.43	Very Good		
		III	Access to the nearby main markets	5.13	Very Good		
		IV	Availability of regional and local production facilities.	3.92	Average	5.07	Very Good
2	Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	I	Efficiency in loading unloading and container discharge.	3.89	Average		
		II	Number of Terminals & capacity.	3.36	Average		
		III	Water depth in the port terminal / Runaway capacity	4.19	Good		
		IV	Major shipping line / Airline connectivity.	4.27	Good	3.93	Average
3	Business friendly legislations, rules and regulations in the country. (BFR)	I	Government support and business friendly policies for the MCC and transshipment operations.	3.69	Average		
		II	Political stability and consistency in applied regulations.	2.59	Below Average		
		III	Business friendly tax policies.	2.85	Below Average		
		IV	Financial policies facilitating free transfer of capital and profit in and out of the country.	1.60	Poor		
		V	Application of intellectual property protection laws.	2.60	Below Average	2.67	Below Average
4	Operating Cost. (OC)	I	Optimum Port Charges, handling and operational cost at the port.	2.98	Below Average		
		II	Optimum Transportation cost from port to the fulfillment center (central warehouse).	2.90	Below Average		
		III	Optimum Labor, handling, storage and operating cost at the fulfillment center.	3.24	Average	3.04	Average
5	Quality of the infrastructure and work performed. (QIWF)	I	Quality of the infrastructure at the Seaport and Airport.	3.49	Average		
		II	Quality of the main infrastructure at the country. (Road, internet, industrial zones)	2.03	Below Average		
		III	Quality of the facilities offered by the private sector service providers.	4.43	Good		
		IV	Quality of the people performing the work in the Private Sector.	4.43	Good		
		V	Quality of the people performing the work Public Sector.	2.87	Below Average	3.45	Average

4.2.4 Findings of the benchmarking analysis Comparing Sri Lanka to Successful Regional Logistics Hubs in Asia.

Through the second questionnaire, industry experts rating on how they benchmark Sri Lanka with other well performing regional logistics hubs were assessed. To gain an insightful detail comparison, benchmarking is done based on the sub factors identified in the literature review. Accordingly, rating for the main factors calculated by taking the mean values of the relevant sub factors. Summarized report of the Sri Lanka comparing to the other regional logistics hubs based on the main factors is given in the Table 4-4.

Table 4-4:

Ratings given by the respondents benchmarking Sri Lanka with the well performing regional logistics hubs in Asia.

Main Factors	Overall Rating for the Main Factor
Regional Location (RL)	Very Good
Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	Average
Operating Cost. (OC)	Average
Quality of the infrastructure and work performed. (QIWF)	Average
Business friendly legislations, rules and regulations in the country. (BFR)	Below Average

In reviewing the ratings given in the Table 4-3 benchmarking the Sri Lanka with the well performing regional logistics hubs in Asia, following findings are summarized.

Geographic location related factors of Sri Lanka were given the highest ratings. This is a naturally inherited factor. Access to the main shipping routes, distance from the hub port to the main shipping routes, and access to the main markets are given highest ratings.

Main Factors	Sub Factors	Mean score for Sub Factors	Overall Rating for Sub Factor	Mean score for Main Factor	Overall Rating for the Main Factor
1	I	Access to the main shipping routes,	5.80	Very Good	
	II	Distance from the main shipping routes to the Hub Port,	5.43	Very Good	
	III	Access to the nearby main markets	5.13	Very Good	
	IV	Availability of regional and local production facilities.	3.92	Average	5.07
					Very Good

The availability of the regional production facilities was rated as “Average” in comparing to the other regional hubs. This is due to the advantage gain by the other regional logistics hubs like Hong Kong and Singapore by getting the easy access to larger production facilities in China, Malaysia, Korea and Japan. Sri Lanka also can gain the same advantage by focusing in the larger production facilities in India, Bangladesh and developing the Free Trade Zones in Sri Lanka to attract more investments to expand the production facilities (Tan & Hilmola, 2012), (Kong et al., 2016), Sundarakani, 2018), (Finnigan, 2019), (Consulting & Management, 2013).

Air / Sea Port facilities, operation efficiencies and connectivity (PFO) related factors are given “Average” rating even though the sub factors like Water depth of the terminals, Air/Sea Connectivity is rated as “Good”.

Main Factors		Sub Factors		Mean score for Sub Factors	Overall Rating for Sub Factor	Mean score for Main Factor	Overall Rating for the Main Factor
2	Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	IV	Major shipping line / Airline connectivity.	4.27	Good		
		III	Water depth in the port terminal / Runaway capacity	4.19	Good		
		I	Efficiency in loading unloading and container discharge.	3.89	Average		
		II	Number of Terminals & capacity.	3.36	Average	3.93	Average

Colombo port is the only deep water terminal in South Asia capable of handling largest vessels (CICT, 2019). Major shipping line and airline connectivity is high in Sri Lanka due to the deep water terminals in in Colombo port and runaway capacity in Katunayake international airport (Sri Lanka Ports Authority, 2021) (Aviation, 2021). Respondents have rated Sri Lanka as average in the handling efficiencies in the port and terminal capacities. As per the literature review, port capacities and handling efficiencies were considered as highly advantages factors in Singapore, Hong Kong and Dubai (Tan & Hilmola, 2012), (Kong et al., 2016), (Sundarakani, 2018).

Business friendly legislations, rules, and regulations in the country (BFR) ware rated as “Below Average” mainly due to following,

Main Factors		Sub Factors		Mean score for Sub Factors	Overall Rating for Sub Factor	Mean score for Main Factor	Overall Rating for the Main Factor
3	Business friendly legislations, rules and regulations in the country. (BFR)	I	Government support and business friendly policies for the MCC and transshipment operations.	3.69	Average		
		III	Business friendly tax policies.	2.85	Below Average		
		V	Application of intellectual property protection laws.	2.60	Below Average		
		II	Political stability and consistency in applied regulations.	2.59	Below Average		
		IV	Financial policies facilitating free transfer of capital and profit in and out of the country.	1.60	Poor	2.67	Below Average

The literature reveals the high importance given in Dubai, Singapore, and Hong Kong on the business-friendly government policies. Tax benefits offered for the startup companies. Attractive financial policies supporting the transfer of capital and profit. Consistency in the government policies and political stability in these countries also considered as import factors to attract the foreign investment and international trade (Tan & Hilmola, 2012), (Kong et al., 2016), (Sundarakani, 2018). From the relevant subfactors, the Government support for MCC operation is rated as “average” and rest of the points were rated as “below average” and “poor”. Therefore, as per the research findings, this is a key area government should start focusing on to attract international business ventures.

Operating Cost (OC) in Sri Lanka is rated as “Average” mainly due to the high transportation cost from the port to the facilities and the operating cost at the port in comparing to the other ports.

Main Factors		Sub Factors		Mean score for Sub Factors	Overall Rating for Sub Factor	Mean score for Main Factor	Overall Rating for the Main Factor
4	Operating Cost. (OC)	III	Optimum Labor, handling, storage and operating cost at the fulfillment center.	3.24	Average		
		I	Optimum Port Charges, handling and operational cost at the port.	2.98	Below Average		
		II	Optimum Transportation cost from port to the fulfillment center (central warehouse).	2.90	Below Average	3.04	Average

Indonesia identified heavy operating of logistics in the country is due the high port charges (The World Bank, 2015). Dubai focus on providing cost effective logistics services to be competitive with Singapore and Hong Kong (Sundarakani, 2018). In Sri Lanka, investments should be done to improve the port infrastructure and transportation to bring out the efficiencies and thereby reduce the overall operating cost.

Quality of the infrastructure and work performed (QIWF) also an important area related to the decision of the regional hub location. In Singapore, government invest in infrastructure development and improving the quality of the services offering. Which has facilitated Singapore in achieving the present status as one of the leading regional commercial and logistics hub (Tan & Hilmola, 2012).

In benchmarking Sri Lanka with the other successful regional logistics hubs, quality of the infrastructure and work perform is rated as “Average” due to the following,

Main Factors		Sub Factors		Mean score for Sub Factors	Overall Rating for Sub Factor	Mean score for Main Factor	Overall Rating for the Main Factor
5	Quality of the infrastructure and work performed. (QIWF)	III	Quality of the facilities offered by the private sector service providers.	4.43	Good		Average
		IV	Quality of the people performing the work in the Private Sector.	4.43	Good		
		I	Quality of the infrastructure at the Seaport and Airport.	3.49	Average		
		V	Quality of the people performing the work Public Sector.	2.87	Below Average		
		II	Quality of the main infrastructure at the country. (Road, internet, industrial zones)	2.03	Below Average	3.45	

The quality of the main infrastructure in the country and the quality of the public sector staff performing the work is rated “Below Average” in Sri Lanka. Government attention should be focus on improving the quality of the staff performing the work in the public sector. Investment on developing the infrastructure should be planned to meet the future demand.

4.2.5 Personal Interview Feedback.

Please refer Annexure 5 for the Personal Interview Feedback of four Industry Experts representing top managerial positions.

4.2.5.1 Findings base on the personal interviews

The four respondents have provided the positive factors and areas to be improved in Sri Lanka to convert to an attractive regional logistics hub based on their experiences in dealing with other regional logistics hub and Sri Lanka. Findings are mostly in line with the feedback received for the questionnaire. The drawbacks encountered by the respondents and the suggestions given by them for the improvements are summarized as follows.

Drawbacks mentioned by the personal interview respondents.

- Even though everybody talks Sri Lanka as a free port, it is not a freeport comparing to Singapore. The rules, regulations, attitude of the government staff not supporting the county as a freeport.
- Most of the international clients still not aware of the new facilities offered by the government to operate freeport activities under Commercial Hub Regulations.
- Risk of government changing the policies and projects initiated by the previous governments.

- Difficulties and no confidence in doing the financial transactions based in Sri Lanka in comparing to Singapore.
- Cost is high to service India, due to local transport cost.
- Container turnover time at port is high.
- Vessels bypassing Colombo port due to capacity issues.
- Local transportation is expensive and not efficient.

Suggestions given by personal interview respondents for improving Sri Lanka as a regional logistics hub.

- The rules and regulations to be reviewed to facilitate the foreign business.
- Port capacities to be improved.
- Government people working attitude in supporting the free trade moment to be improved.
- Need to internationally advertise the facilities offered by Sri Lanka as a Freeport and Regional Logistics Hub.
- Make an international awareness campaign on competitive advantages can be gained by using Sri Lanka as a Regional Logistics Hub in comparing to Jabel Ali and Singapore.
- Need to offer further tax benefits for foreign companies to invest in Sri Lanka.
- E-commerce industry in Sri Lanka need improvements.
- Business registration process for foreign companies to be improved.
- Activities relating to building the confidence in international traders to base in Sri Lanka.
- To reduce the internal transportation and operating cost.
- Operational efficiency improvement programs to be introduced for the port operation and local transport industry.

In reviewing the personal interview feedback with the literature review, following action points taken by Dubai, Singapore, and Hong Kong to improve their hub status can be highlighted.

The most highlighted points in the personal interview feedback are the requirements in improving the government policies supporting the international business transactions, requirement of the stability in application of the policies regardless of the changing the government, and the improvements to be done in the government people working attitude supporting the international business. Singapore focused heavily on improving the people working attitudes, service quality of the people, government policies in support of doing business. Which pave the way for Singapore to claim as a nation of providing the quality services and government policies supporting the business and international trade (Services, 2019).

Requirement of the improvements in port capacities and development of the infrastructure in Sri Lanka is another area voiced by the personal interviewees to develop the country as a regional logistics hub. The achievement of Malaysia by developing the infrastructure at port Tanjung Pelepas (PTP) and reaching the container throughput of nine million TEUs in year 2019 by providing a friendly competition to neighboring Singapore is a remarkable achievement highlighted in the literature review (WEI, 2020b)

High transportation cost and the port handling charges are highlighted by the interviewees as reason for the increase in the operating cost. In countries like Malaysia, Dubai they establish the Free Trade zones near to their main ports to avoid the long distance transportation (WEI, 2020b), (Sundarakani, 2018). In the Hong Kong, developed the Zhuhai Macao Bridge facilitated the transportation and reducing the overall cost (Kong et al., 2016).

In reviewing the Personal Interview feedback, Questionnaire feedback and data analysis result, the weakest point getting highlighted in Sri Lanka is the Business-friendly Legislations, Government Policies, and procedures. The literature reveals the long-term government vision had in countries like Singapore and Dubai to develop their international business and regional logistics hubs. The government policies, procedures in those countries were stable and continually focused on providing the business-friendly atmosphere for the international ventures to establish in their countries. The legislations were strengthened, and equal rights are provided in the court of law to protect their interest. Intellectual property protection laws are strongly imposed (Services, 2019). Governments have always encouraged the private sector participation in the policy decision making (Ramakrishnan, 2017).

Accordingly, the research finding reveals the assumptions of the geographical location will make the Sri Lanka as a regional logistics hub is no longer valid. The competitive logistics hubs in Asia are focusing on improving the quality and service standards regularly. International business ventures are getting attracted with the improved cost-effective facilities and business friendly government legislations. Therefore, requirement of a National Logistics Policy is paramount to develop Sri Lanka as a successful regional logistics hub. A national logistics policy developed in participation of the private sector supporting to develop the country as a regional logistics hub is required to reap the benefits of inherited advantage of the strategic location. Stability of these policies regardless of the changing governments to be assured and established. A committee to be appointed to frequently review on the latest developments happening in the regional logistics hubs, their vision and direction. Accordingly, prompt actions to be taken to upgrade the policies in Sri Lanka as appropriate to the country and to be ahead of the competition.

Government staff working attitude is another area poorly rated by the respondents. This highlights the requirement of government people working attitude improvements in all related sectors. Including customs, airport and seaport authorities, inland revenue, business registration offices, various licensing offices and administrative bodies. The requirement covers the need of developing the soft skills and technical skills to work with international parties and latest technologies. Importance of the time and the need of the international ventures to get the things done with minimum involvement to be understood by all the government parties. Government staff should be ready to embrace the change management without resistance. The change management process should be done with the involvement of government staff at all levels, and participation of people who are aware of improvements happening in the regional logistics hubs.

In reviewing the Internationally used matrix to measure the logistics performance and competitiveness, Sri Lanka is getting ranked far below and nearing to rank hundred. But the successful regional logistics hubs are at the rank within ten. As discussed in the literature review, Logistics Performance Index, Liner Shipping Connectivity Index, Doing Business index are important internationally used matrix to measure the logistics performance and the competitiveness. Sri Lanka needs an empowered body to focus on the measuring areas of these matrix. Need result driven measurable action plan to improve the weak areas.

The Logistics Performance Index measures the following criteria. (The World Bank, 2018).

- I. Efficiency of the customs and border clearance.
- II. Quality of the trade and infrastructure.
- III. Ease of arranging competitively priced shipments.
- IV. Competence and the quality of the logistics services offered.
- V. Ability to track and trace shipments.
- VI. Frequency of shipments reaching the consignee within the scheduled timelines.

The efficiency of customs and the border clearance, which is rated low at the respondents' feedback as poor in the quality of the government staff service in Sri Lanka. The quality of the trade and infrastructure is rated as below average in Sri Lanka. Ease of arranging the competitively priced shipments is directly linked with the operating cost. In the respondents' feedback operating cost in Sri Lanka is rated as average, due to the high transportation cost in Sri Lanka. Further, the distance from the port to the industrial zones also resulted in increasing the transportation cost. Literature reveals the increasing in the air and sea connectivity brings the economies of scale and facilitate the lowering of freight rates. The Competence and quality of the logistics services in the LPI is link

with the respondents' feedback of the quality of the people performing the work in the public and private sector. Even though the respondents have given positive feedback on the quality of the work performed by the private sector, quality of the public sector staff performance need improvements. Accordingly, the outcome of the research feedback suggests the needs in improving the factors highlighted in the logistics performance index.

Doing Business is another important index to be focused to improve Sri Lanka as a regional logistics hub. High rating in doing business index attracts the international business ventures. In the doing business index as per the World Bank Report in 2019, Singapore is ranked as number 2 and the Hongkong is ranked as the number 3. Whereas the rank of Sri Lanka is number 99. Therefore, as per the response received for the questionnaire and the interview feedback, ease of doing business in Sri Lanka need focus and attention from an empowered body to improve. The factor number 8 in the Ease of doing business index covers the Trading Across borders which directly relating to the logistics activities. Under this point measure the time and cost associated with three procedures covering, Documentary Compliance, Border Compliance and Domestic Transportation. Special attention needs to be given in Sri Lanka for improving these areas. Apart from that, doing business index covers the entire process from establishing the business to smooth functioning. To develop Sri Lanka as a successful regional logistics hub and attract more international business ventures, due attention to be given for improving all the factors of the doing business index.

CHAPTER 5. CONCLUTION AND FUTURE RESEARCH DIRECTIONS.

Introduction.

In this chapter, the research findings are reviewed against the research questions to identify the achievements of the research objectives. Accordingly, research conclusion is drawn with recommendation for the improvements in the research subject area and providing the future research directions.

5.1 Summarizing the Research Findings in line with the Research Questions and Objectives.

There were two research questions that the study attempts to answer.

RQ 1: What are the main factors that influence the international business ventures to select a location as a Regional Logistics Hub?

RQ 2: What is the position of Sri Lanka as a regional logistics hub comparing with the other established logistics hubs in Asia in terms of the factors identified in RQ1?

There were three research objectives the research aims to achieve.

RO1: Identify influential factors considered for location decisions of international business ventures for logistics hub operations.

RO2: Identify the significant factors that international business ventures considering in prioritizing and making decision on the most suitable location for their international logistics hub operations.

RO3: Benchmark Sri Lanka as a preferred regional logistics hub in Asia with respect to identified factors.

The 1st research objective was achieved through the literature review. There are 21 factors identified in the literature review relating to the location decision of the international business ventures. These factors were listed under the 5 main factors as follows.

- I. Regional Location.
- II. Air / Sea Port facilities, operation efficiencies and connectivity.
- III. Business friendly legislations, rules, and regulations in the country.
- IV. Operating Cost.
- V. Quality of the infrastructure and work performed.

In line with the 2nd research objective, to identify the priorities and importance giving for the above factors and to convert the expert opinion and psychological aspects into numbers, AHP method was

applied. Pair wise comparison of the five main factors was done as the AHP method to assess the weightage given by the respondents for each main factor. The weightages obtained for each main factor is considered as the priorities given by the industry experts in making the location decisions.

The 3rd research objective of benchmarking Sri Lanka with the well performing logistics hubs to identify the areas for improvements was achieved by questionnaire feedback rating and the interview feedback. Rating was done based on the 21 sub factors identified in the literature review. The benchmarking ratings of the subfactors was summarized under the main factors. Based on the final ratings arrived for each subfactor, areas to be improved is identified. The interview feedbacks provided the insight into the details. Strengths and the weaknesses of Sri Lanka as a regional logistics hub was provided by the personal interview respondents. Based on the questioner data analysis and interview feedback analysis areas for improvements to uplift Sri Lanka as a regional logistics hub is summarized.

By reviewing the figures arrived through data analyses, provides the insight into the question, “Why Sri Lanka is still not the most preferred Regional Logistics Hub even though Sri Lanka has got the best location advantage?”

Table 5-1: Comparison of prioritizing factors for deciding the Regional Hub Location and ratings given for the same factors benchmarking Sri Lanka against the best performing Regional Logistics Hubs.

Factor Sr. No.	Main Factor	Prioritizing factors while deciding Regional Hub Location.		Overall Rating on benchmarking Sri Lanka against the best performing Regional Logistics Hubs.
		Weight Obtained.	Priority Given	
01	Regional Location (RL)	0.28	1	Very Good
02	Air / Sea Port facilities, operation efficiencies and connectivity. (PFO)	0.19	2	Average
03	Business friendly legislations, rules, and regulations in the country. (BFR)	0.19	3	Below Average
04	Quality of the infrastructure and work performed. (QIWF)	0.18	4	Average
05	Operating Cost. (OC)	0.16	5	Average

As per the comparison chart in the Table 5-1, the factor No 1 Regional Location (RL) is given the highest priority while deciding the Regional Hub. Benchmarking Sri Lanka with other best performing Regional Logistics Hubs, Sri Lanka was rated high by the industry experts with regards

to the location advantage. Geographical location is a natural factor inherited by Sri Lanka, and the most spoken by all parties. But the comparison details in the Table 1-5 reveals that the location advantage itself is not sufficient and industry experts expect the meeting higher standards in the other four factors also. Whereas for these four factors, respondents have rated Sri Lanka as average and below average. This brings out the reasons for Sri Lanka not being given the first preference by the international business ventures to select as regional logistics hub. Research findings reveal that the location advantage itself is not enough to decide a regional hub location due to the competitive nature and the facilities offered by the other successful regional logistics hubs. Further, research findings reveals that the effectiveness of the Sri Lanka government efforts in developing the other four factors has not resulted in required level of output, comparing to the improvements taken place in the other regional logistics hubs. Therefore, the immediate requirement of long term, stable strategic approach to improve the other factors is paramount to achieve the vision of develop Sri Lanka as Regional Logistics Hub.

5.2 Recommendations for Improving Sri Lanka as a preferred Regional Logistics Hub in Asia.

As per the objectives of the research and based on the research findings, factors to be improved to uplift Sri Lanka as a preferred Regional Logistics Hub in Asia is highlighted below. This information will be beneficial for the government policy makers, the decision makers in the private sector Commercial Hub operating companies, international freight forwarders and 3PL service providers in Sri Lanka for strategic planning activities to attract international business ventures to Sri Lanka.

Improving the government policies, Business Friendly Legislations, Rules and Regulations in the Country.

Reference to the ancient Sri Lanka and the era before the civil war, was a period provided more attraction to Sri Lanka as a regional hub due the political stability and government visionary leadership. Development in the Colombo port from 1978 and the Establishment of Free Trade Zones in Sri Lanka in 1978 were features attracting International Business ventures to Sri Lanka comparing to the other regional locations.

As per the findings of this research, Government policies, Business Friendly Legislations were the lowest rated by the survey respondents and the personal interview respondents. Therefore, higher attention to be given by the government and the relevant authorities for the improvements. There should be a firm action plan to improve the Doing Business Index. Doing Business covers ten parameters representing various sectors. The action plan should comprehensively cover the entire

spectrum to bring out a positive impact. Political stability and consistency in applying the rules and regulation in the related areas to be improved. National policy to be formed in the related development areas to maintain the consistency of implementing the policies regardless of the political party changes. Protecting intellectual Properties are one of the primary requirements of the international business ventures. Therefore, application of intellectual property protection laws to be improved. Startup business always get attracted with the tax benefits and financial concessions. Therefore, more relax financial and tax policies are required to attract the new investors and MCC operators to use Sri Lanka as their hub. As per the findings in the literature review, government focus on Free Trade Agreements and number of FTAs sign with various countries have boosted the international trade in Singapore, Hong Kong and Dubai. Therefore, Sri Lankan government focus is required in expanding the number of Free Trade Agreements with different markets.

Improving the Air / Sea Port Facilities, Operation Efficiencies and Connectivity .

The recent expansion in the port of Colombo and construction of the deep-water terminal at CICT facilitate the growth of container throughput from 3.4 million TEUs to 7.2 million TEUs resulting 112% growth. As per the feedback received for the questionnaire and in the personal interview, the present capacity in the port is not meeting the demand. Respondents have highlighted the vessel bypassing the Colombo port due to the congestion and long waiting. Therefore, Port terminal capacities to be improved to increase the container handling capacities and operating efficiencies. Liner shipping connectivity index is the internationally accepted index to monitor the sea connectivity. Therefore, actions to be taken to improve the Liner Shipping Connectivity Index. Similar approach to be taken to improve the Air Line Connectivity. In the literature, Singapore, Hong Kong, and Dubai, hail their success as regional logistics hub with the expansion of the Air and Sea connectivity.

Reducing the Operating Cost.

Operating cost can be reduced with the adoption of new technologies to bring in efficiencies and expanding the scale by increasing the handling volume. Literature reveals that increase in the Air/Sea connectivity has facilitated the increase in volume in Singapore ports thereby facilitated to bring down the operations cost. Therefore, in Sri Lanka, solution to be worked out to bring in the technologies and efficient handling procedure in the ports to improve the efficiencies. Solutions such as rail transport systems to be arranged to reduce the inland transportation cost. Throughput volumes in the ports to be increased to bring the scale and reduce the port charges, and transshipment handling charges.

Quality of the infrastructure and work performed.

Highway and the road infrastructure improvement in Sri Lanka is commendable. Further, improvements required in the rails cargo transportation to reduce the inland transportation cost. Quality of the other facilities such as supply of water, sustainable energy, internet facilities to be upgraded to facilitate the international business. Attention to be paid in improving the government staff quality of working especially in customs and related areas as very poorly rated by survey respondents and in the personal interview feedback. As per the interview feedback, requirement for E-commerce business is having increasing demand. Therefore, e-commerce related infrastructure facilities to be improved.

Improving the Air/ Sea turnaround business through Sri Lanka.

As per the literature review, Sri Lanka is a strong transit hub for Air / Sea shipment turnaround. To gain the maximum advantage of this sector, improvement to be done in facilitating the operation during the Sundays and Public holidays with least overtime charges. Further, IT infrastructure network facilitation between Sea Port and the Airport for customs clearance and port connectivity to be improved.

Internationally promoting Sri Lanka as Regional Logistics Hub.

As per the response from the personal interviewees, international ventures are not aware of the facilities offered by Sri Lanka to promote international businesses. Therefore, marketing and promotion campaign required to be launched internationally highlighting the,

- i. Location Advantage,
- ii. Legislative reforms, business facilities and tax benefits offered by the Hub Act / Commercial Hub Regulation No 1 of 2013.
- iii. Cost-effective, high-quality work performed by well-educated Sri Lankans.
- iv. Air/Sea shipment turnaround facilities.
- v. Improved infrastructure facilities such as Highway, Hambanthota Port, Mathala Airport, Deep water terminal at Colombo port etc.

Further, as per the feedback from the interview respondents, international communities do not have the confidence in doing financial transactions through Sri Lanka in comparing to Singapore and other regional hub operating countries. Therefore, measures to be implemented to develop the banking sector and financial policies in facilitating the international business transactions. Thereby develop the confidence among international parties to perform finance and business transactions from Sri Lanka.

5.3 Research Limitations.

There are few limitations faced with this research. Out of them, identifying the sample respondents based on the experience and exposure in dealing with international logistics hubs as well as involvement in Sri Lanka on international logistics operations was a limitation. Further, for the literature review, availability of the previous research on Sri Lanka as an International Logistics hub also a limitation faced with this research.

5.4 Future Research Directions.

Based on the findings of this research, further research can be conducted on the following areas to support the vision of the nation to make Sri Lanka the most preferred international Logistics Hub in the Indian Ocean.

1. Further research can be conducted on different samples on the influential factors identified in this research for location decisions for international business ventures.
2. Conduct research on the improvement areas identified in this research to come out with suitable improvement strategies to be implanted in Sri Lanka.

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Annexures.

Annexure 1 – Commercial Hub Regulation No 1 of 2013.



Anx 1-
Commercial-Hub-Reg

Annexure 2 – Online questionnaire.



Anx 2 - Online
Questionnaire.docx

Annexure 3 - Respondents' feedback for the online questionnaire and data analysis. (Pair wise comparison of the Main Factors and application of AHP techniques.)



Anx 3 - Main factor
Pair Wise Comp Data

Annexure 4 – Respondents' feedback for the online questionnaire and data analysis on Benchmarking the Sri Lanka against the best performing Regional Logistics Hubs.



Anx 4 - SL
Benchmark with Othe

Annexure 5 – Personal Interview Feedback of the four Industry Experts representing top managerial positions.



Anx 5 - Respondents
Feedabck on Personal