Original Article

Logistics Performance and Its Impact to the Transshipments Operations at Port of Colombo

Dissanayake I.; Mudunkotuwa R.*

Department of Logistics and Transportation
Faculty of Management Social Science
CINEC Campus (Pvt)
rashika@cinec.edu

Abstract

Transportation services have come to be an increasingly essential part of world trade. Freight shipment movement as a part of the maritime enterprise capabilities very particular traits. For this study, the development of transshipment operations is set in the context of Logistics Indexes of impact. Researches about the outcomes on Port transshipments Operations is particularly untouched. Research will subsidize to the understanding of how Sri Lankan's Logistics Performance Indexes (LPI) influence the transshipments operations at Colombo Port. Using data gathered from Central Bank Reports, Port Annual Reports, World Bank and Questionnaire survey. There are two-analysis part, (1.) Review of the factors consider building of LPI (2.) Relationship among the transshipment operations. This study will contribute to the issues/challenges, achieving hub status barriers, what are the possible solutions to overcome will discuss, and reviewing too. For this using factor analysis, validity, etc. This research contributes to the understanding of transshipments operations in logistics context. This study will use the data from the year 2007 to 2019, because LPIs also published by World Bank every other in two years. This research will answer the research question on which of Sri Lanka's LPI has an association with Colombo Port transshipments operations. Moreover, which LPI have the greatest impact, to what operations enhancements in logistics performance effect on transshipments of Port of Colombo, issues/challenges, and logistics related barriers and possible solutions. The research question is answered using hypotheses, using Pearson's correlation, regarding Sri Lanka's Customs, Infrastructure, Logistics quality & Competence, Tracking & Tracing, Timelines and International Shipments. The data analyzed using a linear regression model and the analysis will reveal the influence of the LPIs that are explanatory for Colombo Port transshipments operations. Through the analysis it was found that for transshipments operations, all the hypotheses, except the hypotheses related to Customs and Timelines were excluded from analysis, which means that transshipments operations, there is a linear association with the identified LPIs except for Customs and Timelines.

Therefore, the main objective of this research is to identify which LPI and affect the operations at transshipment operations handled at Colombo Port. Other objectives include – Identifying issues in enhancing Transshipment's operations in port of Colombo, Identifying the LPI indexes related to the logistics related respondents and Identifying the issues/challenges, logistics

related barriers in order to achieve hub status and possible solutions to overcome these problems.

Keywords: Logistics Performance, Transshipment's Operations, issues/challenges, barriers, solutions.

Introduction

In this layout of the marine sector advancement, the transshipments and logistics performance of Sri Lanka connected with the improbable eagerly of the Port of Colombo due to Logistics has become a vital measurement within the field of worldwide exchange with later universal changes. In addition, this chapter present problem statement objectives, questions and significance of the study, scope and structure of the study. In this study background, study divided into four parts, which is Seaports, Port of Colombo, Logistics Performance Indexes (LPI) & Transshipment Operations. A seaport may be an advanced system that consists of the various interacting elements, which are captivate with many random elements. Port offerings might be a derived call for from import, export and transshipment, it solely takes place due to the interplay between individuals or sectors inside the economy or across countries who exchange merchandise, which be made and consumed at unique geographic places. Furthermore, it has recommended as a Colombo Port as a major Multi Country Consolidation hub due to geographical location (Gajanayaka & Mudunkotuwa, 2015). The port is tremendously sizable as the Colombo International Container Terminals (CICT) is the most effective deep-water terminal in South Asia that is able to handle the biggest vessels and extra shipments. With three operational terminals instead of the single terminal operator in each Singapore and Dubai, the Colombo port has a collective hooked up capacity of over 7 million TEU[1]s implements in December 2018. Sri Lanka has four primary seaports, particularly: Colombo Port, Galle Port, Hambantota Port, and Trincomalee Port. Colombo Port amongst others is the largest and handled 94.84 % of shipment in 2017. Due to the fact Sri Lanka is that the totally land mass extending out into the Indian Ocean between the Arabian and Malayan peninsulas additionally as being handiest six to ten transportation miles some distance from one amongst the busiest East-West shipping routes. It provides land a locational gain as soon as developing as a maritime hub (Sri Lankan Ports Authority, 2018) Transshipment centers encourage global shipping as an center of the street intention by changing shipment from bulky vessels to minor vessels and vice versa, and serve the enduring ports of purpose or any other transshipments port. Transshipment hubs facilitate global delivery as an intermediate vacation spot by means of transferring cargo from large vessels to smaller vessels, and serve the previous ports of end or any other transshipments port. Arvis, et al., (2016), year from 2007, the arena World Bank distributes LPI[2] for each different a long time. The six parameters of LPI can be classified into bunches. The primary three relate to route and considered as contributions to supply chain. The instant three components are associated with performance effects.

Inputs of supply chain:

- Customs: The output and adequacy of the tradition readiness technique are measured through pace, straightforwardness and consistency of traditions corporations

[1] **Twenty Footer Equivalent Units**
[2] **Logistics Performance** Indexes

- Infrastructure: The best of the country is shipping and broadcast communications framework measured under this difficulty.
- Logistics quality and competence: It measures how positive parties give best logistics administrations to clients and optimize the relationship between groups and clients.

Outputs of supply chain:

- Tracking and Tracing: It measures the following and following of shipments. Following alludes to spotting the appropriate region and the course of each dispatch as a good deal as its conveyance to the conclusion consumer.
- Timeliness: The promptness of cargo conveyance times measured thru convenience. The delays of shipments influence unfavorably on the prevailing tall level of opposition.
- International shipments: It measures how easy it is to set up shipments at competitive prices.

Literature Review

The classical assumption such as the hypothesis of emergence supply mileage, shipment tracking: traceability of the shipments, international transport: competitive pricing in loading and a few present – day assumptions taken to clarify. Under the second part review, the studies on causal flows from LPI to transshipments and its components reviewed from the view of trade facilitation through a macro to micro perspective. In addition, the key concepts of hypotheses taken beneath the think about will give an establishment for planning questions within the logistics overview and triangulating the experimental discoveries. The World Bank LPI summarizes the performance of nations on six dimensions or indexes, which might be customs, infrastructure, international shipments, logistics quality and competence, tracking and tracing and timeliness. The index makes an essential statistical contribution by means of setting up a harmonized scale of all of the nations a good way to become aware of the problems faced by using bilateral trade, together with their necessities in terms of logistics related from the present facilities (World Bank, 2018). It has helped growth consciousness of the difficulty, establishes priorities for reform and improve public-personal communicate, and promotes trade and shipping in extraordinary nations. Until 2005, the ones responsible did no longer have enough records to been had to them to make comparisons and perceive limitations to trade, and accordingly the LPI is a key device that explains the relationship between trade and shipping facilitations (Desarrollo, 2010). The World Bank has published this index for years Arvis, et al., (2007) ranking 150 countries and presenting an in depth clarification of logistic overall performance of those nations. The first edition depicts records compiled in 2005 and published in 2007, the second one incorporates statistics processed between 2008 and 2009 and published in 2010 and the modern day version refers to records for 2010 that was published in 2012. The index makes an essential statistical contribution by means of setting up a harmonized scale of all of the nations a good way to become aware of the problems faced by using bilateral trade, together with their necessities in terms of logistics related from the present facilities. It is a strong aggregate of numerous dimensions from a global attitude and is constructed using well-known econometric strategies to maximize significance and improve self-assurance levels.

Methodology

Sampling bias may be minimizing through enhancing the accuracy of the acquired data with the aid of using valid resources to gather the desired statistics. This research based totally on quantitative statistics, which has been collect through primary and secondary information sources. First of all, the conceptual show of the entire reflect on consideration on supplied with the foundation of the shape of the whole proposition. This methodology chapter will focus on the strategies and processes a good way to be used to emerge as privy to the connection among the country's LPI, Logistics typical overall performance Indexes (independent variables) and Transshipment Operations at Colombo Port (established/ dependent variable). This is turned into planning to be try through using facts set comprising of different secondary statistics and primary data sources bringing up to a go-location examination for analyzing the improvements inner a time define from 2007 to 2019

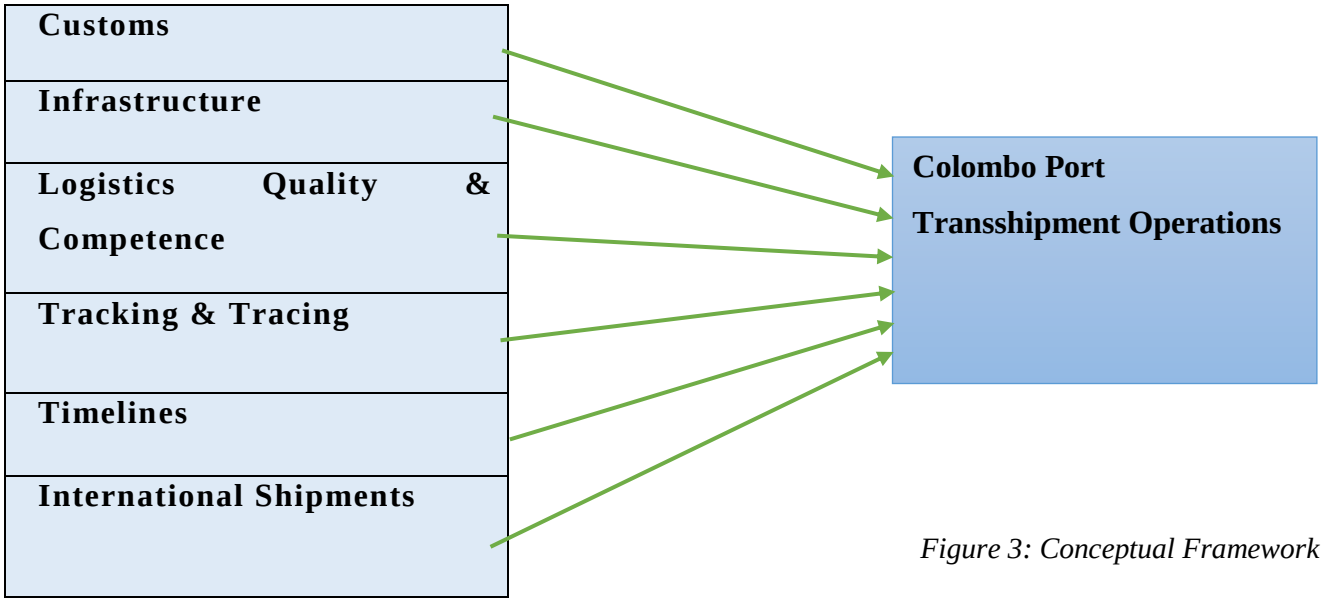

Figure 3: Conceptual Framework

Data Analysis and Discussion

In this using primary and secondary data for the analysis. Firstly, using questionnaire data as a primary data for the analysis Review of the factors consider building of LPI, and using secondary data find Relationship among the transshipment operations.

In primary data analysis, essentially, it was felt that participants had been reluctant to respond revealing their identification due to the fact many questions were addressed problems of government rules and strategies of government corporations. This phase presents a qualitative analysis via the outcomes of logistics survey, which changed into carried out to analyze the status of logistics performance of Sri Lanka. Only 271 population under that using stratified sampling method 160 participants were target as the sample to the answer questionnaire survey via email. Consequently, only one hundred and forty (140) participants responded and among them are Senior Executives 47.14%, Country Manager 24.29%, Department Manager 18.57%, Supervisors and Other (Junior Executives) 2.86%. Over half of those responded, 37% represented Freight Forwarding/NVOCC operating Business firms, whereas 34% respondents were shipping agents. The 22% of responses from manufacturer/importer/exporter were report. Organizational level and, the cargo of your company is mainly transport by. Only 72 respondents are Country Branch Office, 30 respondents from Local Branch Office, 22 respondents from Headquarters and only 16 respondents from Independents Firms.

In following graph shows the descriptive statistics of the variables,

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation
Time for Trade	2.05	0.984
Cost of Trade	4.04	0.808
Quality of infrastructure	4.15	0.885
Efficiency of customs clearance process	1.94	0.883

According to Issues/challenges of Sri Lanka logistics performance, major logistics related barriers; possible solutions to Sri Lanka's logistics performance challenges are accept level.

Below two hypotheses are defined for Bartlett test for above three factors, Cronbach's Alpha method used to find out the reliability of the data set and it was found above the accepted value 0.6.Hence data set can be accepted as a reliable data set. KMO value for the data set was accepted which is greater than the 0.6. It is the recommended value for the test and exceeding 0.6 shows an adequate sample in the study ((Gamachchige & Mudunkotuwa, 2017).

H_0: Correlation metrics is an identity matrix.

H_1: Correlation metrics is not an identity matrix.

Table 6: Factor Reduction Summary

1) Issues/challenges of Sri Lanka Logistics Performance	Main Issues and Challenges	Poor Quality infrastructure Government regulations/restrictions Issues of Inland Transportation causes to delays & high costs Technology barriers/Lack of usage
	Other/ Environmental Issues	Criminal activities(stealing/corruptions) Informal Payments
2) Possible Solutions to Sri Lanka's Logistics Performance Challenges	Government based solutions	Infrastructure development (Port, Air, Road, Rail & Warehouse) Trade friendly regulations & policy cohesion Development of Inland Transportation
	Activity based solutions	Automation of Logistics industry with reengineering & restructuring systems
3) Possible Solutions to Sri Lanka's Logistics Performance Challenges	Government based solutions	Infrastructure development (Port, Air, Road, Rail & Warehouse) Trade friendly regulations & policy cohesion Development of Inland Transportation
	Activity based solutions	Automation of Logistics industry with reengineering & restructuring systems

Discussion, Limitations and Conclusion

Among the above – mentioned significant factors, Infrastructure, Logistics quality & Competence, Tracking & Tracing and International Shipments for the enhancement at the Transshipments Operations at Port of Colombo. The study examines the impact of Sri Lankan's Logistics Performance Indexes (LPI) on transshipments operations at Port of Colombo. This data and variables used to develop regression models to help identify the significant logistics indexes, which affect Transshipment operations at Colombo Port. The operations project will assist Colombo Port to stay in advance of the demand curve, this is crucial not only for the port's operations, but also for the survival of Colombo Port as a transshipments port. All with all of this, the intention turned into to create a transshipments hub in Sri Lanka could require proper transshipments forecasts in order that Colombo Port can be geared up to deal with upcoming demand, particularly whilst designing the expansion project. Therefore, studies carried out in this research area became not effortlessly to be had or accessible and hence most of the inspiration to this study changed into based on research that had been accomplished on the subject of port throughput rather than port transshipments operations. Even though there was lots of research achieved on the relationship between logistics activity and port throughput, unfortunately, there has been very little prior studies finished when it comes to LPI and transshipments operations. For this study, the data gathered through secondary sources and primary source, this done as the resources and authorization to collect the required data was not available because collecting data on LPI and port throughput is usually done through government funding and large cooperation. However, due to the fact port throughput is a broader concept than transshipments, relating to research based totally on throughput may have an effect on the manner the research on transshipments become conducted. Recommended to read "The Colombo Port Vol I and II written by Prof. K. Dharmasena."

References

1) Arvis. et al., 2016. Trade Logistics in the Global Economy: The Logistics Performance Index and Its Indicators. Trade Costs and Development: A New Data Set.", Issue Issue 104. World Bank, Poverty Reduction and Economic Management Network, Washington, DC..

2) Arvis, J.-F.et al., 2007. The Logistics Performance Index and Its Indicators. Connecting to Compete 2010 : Trade Logistics in the Global Economy-.

3) Desarrollo, B. I. d., 2010. Evaluación de la Facilitación del Comercio y el Transporte Banco Mundial.

4) D. F. -. E. p. S. L., 2017. Developing the Sri Lankan Maritime Industry,. [Online] Available at: http://www.ft.lk/opinion/Developing-the-Sri-Lankan-maritime-industry/14-

5) Edirinsinghe, L., 2013. CROSS-BORDER LOGISTICS PERFORMANCE IN SRI LANKA; THE WAY FORWARD. International Conference on Business Management, pp. 1 - 17.

6) Gajanayaka, H. & Mudunkotuwa, M., 2015. A study of developing Colombo Port as a major multi country consolidation(MCC) hub in South East Asia region with the help of improving the effectiveness of the MCC activities. Colombo, roceedings of 8th International Research Conference, KDU.

7) Gamachchige, J. D. & Mudunkotuwa, M. R. .., 2017. Factors considered by shippers when selecting a freight forwarders. s.l., Navel and Maritime Acadamy Logistic Journal.

8) LBO, 2018. LBO; Lanka Business Online. Colombo Port transshipments up by 19.8-pct in 1H; targets 7mn TEUs for 2018.
9) Nightingale, L. & Baker, J., 2018. Lloyd's List. ONE HUNDRED PORTS Maritime Intelligence Informa 2018.
10) S. L. E. D. B., 2018. Sri Lanka Export Development Board. Port of Colombo and Port of Hambantota.
11) Sri Lankan Ports Authority, C. P., 2018. Sri Lankan Ports Authority, Colombo Port. [Online] Available at: https://www.slpa.lk/port-colombo/colombo
12) W. B., 2018. Connecting to Compete, Trade Logistics in the Global Economy. The Logistics Performance Index and its indicators.