

PORT CHALLENGES AND ISSUES OF PORT AND CONTAINER TERMINAL**Dr. Shamsi Sukumaran¹, Dr.Ranjith Somasundaran Chakkambath², Naveen Jacob³**¹Management Studies, AMITY Global Business School Kochi² Management Studies, AMITY Global Business School Kochi³ Management Studies, AMITY Global Business School Kochi

Abstract - Ports are the gate ways for trade. A critical role in the development of many countries is catered by the ports. Port reflects - national heritage, culture, local and commercial attitudes. Most ports are not as efficient as they should be and its creating barriers to international trade. Most ports are plagued with problems like clearance delays, inadequate investments, captivity issues, increased freight rates, lack of effective strategies, and inappropriate international mandates. Some other challenges faced in respect of existing ports include inadequate road networks within the port area, inadequate cargo-handling equipment and machinery, inefficiency due to poor hinterland connectivity through rail, road, highways, coastal shipping and inland waterways, inadequate navigational aids. The study was done related to the activities of a Minor port and Multimodal ICD at Kottayam. The sample size included 100 respondents from the facility. Factor analysis was done using IBM SPSS to arrive at the required output. The research was able to identify certain factors that influence the port operations and also the challenges faced by the port of study. Lack of certain key facilities and under utilization of multimodal transportation strategy were identified to be a major contributor to issues at the minor port.

Key Words: Ports, ICD, Multimodal,Factor analysis,Minor port, Inland waterways.

1.INTRODUCTION

Trade growth is one of the major indicators of the progress of a country. Its sheds light on the economic condition. Internal trade of a country aims to balance the requirement as well as the economic stability of the country.

Water transport has been critical in Indian economy. It is an easy and cheap means of exports and imports of heavy items. The role of ports and their relevance in trade becomes more important with this. A port is a gate for entering into land from sea. In fact, a port is a place in a waterway where a ship can stop for loading and alighting goods. Ports acts as nodal points for land and sea trades.

Logistics has been performed from the start of progress. Logistics includes the combination of different cycles like transportation, stock, warehousing, material taking care of, data and bundling. Actualizing best act of logistics has gotten quite possibly the most energizing

and testing operational areas of business and public sector.

According to the Ministry of Shipping, majority of India's trading by volume and a huge amount by value is done through maritime transport. In November 2020, the Prime Minister, Mr. Narendra Modi renamed the Ministry of Shipping as the Ministry of Ports, Shipping and Waterways.

India has 12 major and 205 notified minor and intermediate ports. Under the National Perspective Plan for Sagarmala, six new mega ports will be developed in the country. These ports are pivotal in sustaining growth in the country's trade and commerce. India is the sixteenth-largest maritime country in the world with a coastline of about 7,517 kms.

Inland waterways have been accorded a central role in maritime development in India. The National Waterways Act 2016, has declared 111 rivers or river stretches, creeks, estuaries in India as National Waterways. Navigation in rivers, lakes and other water bodies by smaller vessels connecting places not far from each other has been around for centuries, and been the mainstay of our inland waterways. Inland waterways requires a multimodal network comprising water bodies and roadways, including culverts, bridges etc, to be developed. Some of the port/terminals, such as Varanasi are planned as multimodal hubs which will connect rail, road and waterways.

The ICDs have a pivotal role in facilitating the movement of cargo to various destinations across the country. This in turn supports the different sectors like pharma, agro and other essential sectors of the industry. The paper tried to investigate and understand the activities of Kottayam Port and Container Terminal Services Private Ltd (KPCT) which is acting as ICD in the region supporting various industries. The research paper aims to identify the challenges at Port Terminals and in providing suitable strategies to overcome it.

1.1 Objectives Of the Study

To study the Port Challenges and Issues of Port and Container Terminal Services.

1.2 Scope of the Study

The research was focused on the activities of Kottayam Port and Container Terminal Services Private Ltd (KPCT). Logistics comes to play when the movement of goods happen. So, it is sure that many risk and challenges comes along with this process. The investigation focused on the understanding the factors that influence the port operations and also the major challenges at the facility. For understanding the factors, the first step was to know what all activities are done in a port. Secondly, the workers in a port are to be taken as respondents of the survey so that every detail and information's can be attained. The port facility was spread across 10 acres of land approximately, which handles many products and services. The data was collected through survey questions to arrive at the required responses.

2. Literature Review

There have been previous research publication related to the Usage of good Information and Communication Technology helps in improving the multimodal transport operations (Mondragon et al, 2018). The future can be shaped to multimodal logistics (Lyridis et al, 2018), which was elaborated in literature that process modelling was a better way. Build process models of different port operations and functions, which includes cargo units, at different levels using a hierarchical approach.

Some researches proposed many important factors that should be carried out in a port and i.e., to deliver suitable services like cargos should be sent regarding the time and path length (Paixao, Bernad Marlow and Casaca, 2018). So that helps in setting an optimum time and this also provides the customers a flexible ordering method. The importance of long term relationship with customers helps in increasing the sales growth which leads to increase in profitability was stressed in literature research was found (Kalwani and Narayandas, 1995). For a good relationship with customers, appropriate governance structures in port are essential.

Literature in research related to port functions focus on three main functions that are administrative functions (safety, security, customs control, health etc), operational functions (berths and sheds, loading and discharging cargo distribution etc) and civil engineering functions (sea and land access, road and rail network etc) (Alderton and Saieva, 2013). Studies have showed that the whole process in a port can be summed up to be an integration between functions and actors of the port (Panayides and Song, 2009).

Previous research on the supply of goods from ports show that they are having a direct impact from the

demand of the customers and the market is driven by this factor (Wilmsmeier and Notteboom, 2011). Their study reveals that, the logistics in a port is having inter-links between nodes and transport modes (Bichou and Gray, 2004). Recent studies on the role of this logistic player, challenges and opportunities have been found across different parts of the world (Rodrigues et al, 2021). The literature on the challenges and the importance of ICD (Inland Container Depot) have been identified which was a part of this research paper also (Zainuddin et al, 2019; Adejumo, 2020; Rathnayake; 2021). ICDs act as an important element in the Logistics network to maintain the smooth transaction of cargo between different stakeholders.

3. Research Methodology

Research Design: This research made use of a Descriptive research design to conduct the research.

Sampling Method: In this research convenient sampling method is used to collect information using questionnaires.

Sample: The sample consists of data collected from Kottayam Port and Container Terminal Services Pvt Ltd (KPCT).

Sample Size: The sample size selected for this research is 100.

4. Results and Discussion

As part of the research, data was collected using survey. The Questionnaire was used as the primary source to collect the data from the sample population of respondents who were working at Kottayam Port and Container Terminal Services Pvt Ltd. The organisation was a multimodal ICD (Inland Container Depot) and minor port. Secondary data are that information which are already published, for this study journals, articles, websites have been used. Data analysis was done using SPSS software. The techniques used for this analysis are Percentage analysis and Factor analysis.

Table No.1

ACTIVITIES OF BUSINESS ORGANIZATION

Activities of Business Organization	Frequency	Percentage
Import & Export	94	94
C&F Agent	0	0
Shipping line and Container Leasing	0	0
Logistics & Supply Chain Management	6	6
Total	100	100



Fig 1: Activities of Business Organization

On the above graph it is shown that activities at the port of study was having 94 percent of Import & Export activities and the rest 6 percent of respondents were of the impression that the port was having Logistics & Supply Chain Management. No one response was obtained to C&F agent and Shipping line and Container leasing activities.

Table No 2:

SORT OF GOODS AT THE PORT

Sort of Goods	Frequency	Percentage
Spices	55	55
Machinery	0	0
Textiles	20	20
Food Products	25	25
Hazardous Goods	0	0
Total	100	100

As seen in the graph, the minor port dealt with Spices, Textiles and Food products. The respondents said that 55 percent is of the spices, 25 percent is of the food products and the last 20 percent is of textiles. The Minor

Port does not deal with sort of goods like Machinery and Hazardous goods.

FACTOR ANALYSIS: Challenges that effect Port Business Activities.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.652
Bartlett's Test of Sphericity	Approx. Chi-Square
	df
	Sig.
	135.60
	3
	28
	.000

From the table KMO value is "0.652" (sample adequacy ratio). Therefore, the sample size is just adequate to conduct the study. n SPSS. The sampling is adequate or sufficient if the value of Kaiser Meyer Olkin (KMO) is larger than 0.5 Field (2000), according to Pallant (2013) the value of KMO is 0.6 and above. Kaiser (1974) recommends a bare minimum of 0.5 and the value between 0.5 and 0.7 are mediocre, value between 0.7 and 0.8 are good, value between 0.8 and 0.9 are great and value between 0.9 and above are superb (Hutcheson & Sofroniou, 1999

From the table Bartlett's test significant value is "0.000". Therefore, reject the null hypothesis. The strength of the relationship in SPSS can be measured by a Bartlett Test of Sphericity. It is actually a measure of a multivariate normality of set of distribution. This test also checks the null hypothesis that the original correlation matrix is an identity matrix. The significant value less than 0.05 indicates that these data do not produce an identity matrix and are thus approximately multivariate normal and acceptable for further analysis (Pallant,2013).

Table 4: Communalities

	Initial	Extraction
Performance	1.000	.592
Storage	1.000	.560
Delivery	1.000	.578
Expensive	1.000	.767
Department	1.000	.708
Procedure	1.000	.612
Pollution	1.000	.651
Charges	1.000	.579

From the output of Communalities table which shows how much of the variance in the variables has been accounted for by the extracted factors. The table shows all the variables have variance greater than .5. Therefore, none of the variables were removed from the Factor analysis stage. The variable -"Expensive"

accounts for 76.7 % of the variance while the next highest variance was accounted for by the variables, "Department" with 70.8 % of variance. The lowest variance was shown by the variable, " Storage" with approximately 56 % was accounted for.

Table 5: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.463	30.791	30.791	2.463	30.791	30.791	2.057	25.715	25.715
2	1.345	16.815	47.607	1.345	16.815	47.607	1.652	20.649	46.364
3	1.239	15.485	63.091	1.239	15.485	63.091	1.338	16.728	63.091
4	.831	10.391	73.483						
5	.706	8.826	82.309						
6	.554	6.926	89.234						
7	.497	6.209	95.443						
8	.365	4.557	100.000						

Extraction Method: Principal Component Analysis.

From this table, it proves that the first factor accounts for "30.791%" of the variance, the second "16.815%" and the third "15.485%". All the remaining factors are not significant. The eight variables were reduced to three components.

Table 6: Component Matrix^a

	Component		
	1	2	3
Performance	.580	-.278	.423
Storage	.578	.193	-.434
Delivery	.611	-.134	.431
Expensive	-.209	.706	.474
Department	.138	.829	-.044
Procedure	.420	.066	-.657
Pollution	.793	.148	-.001
Charges	.742	.027	.167

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

The table shows the loadings (extracted values of each item under 3 variables) of the eighth variables on the three factors extracted. The higher the absolute value of the loading, the more the factor contributes to the variable. In this it is extracted to three variables wherein the 8 items are divided into 3 variables according to most important items with similar responses in component 1 and simultaneously in component 2 and 3).

Table 7: Rotated Component Matrix^a

	Component		
	1	2	3
Performance	.751	-.057	-.157
Storage	.201	.717	.078
Delivery	.760	-.015	-.017
Expensive	-.013	-.348	.804
Department	-.037	.287	.790
Procedure	-.033	.775	-.104
Pollution	.625	.490	.145
Charges	.695	.302	.071

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Based on the results of Factor analysis, the first component was named as "Logistics Factors" which included Delivery, Performance, Charges and Pollution. The second component was named as "Storage Factors" which included Procedure and Storage. The third component was named as "Department Factor" which included Expensive and Department. Similar study by related to the challenges in implementing container terminal system at Port of Mombasa, has highlighted factors like technology, organisational and environmental issues (Gekara et al, 2020). A report published based on their investigation, came to find that the major issues are port congestion, customs clearance, shipping line issues & charges, documentation & paperwork and regulatory clearance (Dun & Bradstreet, 2018). The factors mentioned in this report has similar factors to this research which included procedure, delivery, performance, charges as contributing factors to challenges in ports.

Major Challenges at the Port:

The Minor port gave a "Single Window System" for helping the Importers/Exporters. The port was proving to be a good facility to the Importers and Exporters that they have 40000 sqft. Warehouse. It provided single window clearance for all the ICD operations, Online tracking of Goods and services. The port handled around 300 containers for exports. However, certain challenges were there limiting the further growth of the port.

Some of them which were observed are mentioned here:

1. *Lack of Efficient packing units:* Organization should provide good packaging system so that transportation efficiency can be increased and also utilize the ICD facilities.

2. *Multimodal transportation facility is under utilized :* The objective of utilizing Inland streams is that the complete logistics cost can be reduced and furthermore the state can save Rs 800 crore for every annum as fuel as we grow Inland Waterways. Presently road transportation facility is used more dominantly.

Conclusion

The research was conducted to find out the Port Challenges and Issues in Kottayam Port and Container Terminal Services Private Limited. The research tried to identify the major factors related to performance of the minor port of study. As a result, three factors were identified based on factor analysis. The factors were - Logistics factors, storage factors and Department factors. Previous studies, supported similar variables in their research. Some of the challenges or performance obstacles were found related to the study of the minor port. These included the lack of proper packing units and also under utilisation of multimodal transportation mix. The Company needs to focus on these to increase their revenue for future expansion.

References

- Adejumo, I. A. (2020). Challenges of Inland Container Depots in Nigeria. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*, 73(1), 76–87. https://asrjetsjournal.org/index.php/American_Scientific_Journal/article/view/5868
- Bowersox D.J., Closs D.J., *Logistical Management*, McGraw-Hill, 1996, Challenges of Implementing Container Terminal Operating System: The Case of the Port of Mombasa from the Belt and Road Initiative (BRI) Perspective Chopra Sunil and Peter Meindl (2001), *Supply Chain Management: Strategy, Planning and Operation*, DOI: <https://doi.org/10.24006/jilt.2020.18.1.049>
- Field, A. (2000). *Discovering Statistics using SPSS for Windows*. London – Thousand Oaks – New Delhi: Sage publications.
- Hadi, N. U., Abdullah, N., & Sentosa, I. (2016). An Easy Approach to Exploratory Factor Analysis: Marketing Perspective. *Journal of Educational and Social Research*, 6(1), 215. Retrieved from <https://www.richtmann.org/journal/index.php/jest/article/view/8799>
- Hutcheson, G. D., and Sofroniou, N. (1999). *The Multivariate Social Scientist: an introduction to generalized linear models*. Sage Publications.
- Inland port logistical issues in Northern Region of Peninsular Malaysia - UUM Repository*. (n.d.). Retrieved August 23, 2021, from <http://repo.uum.edu.my/26236/>
- Inland waterways – positive impact on economy | ORF*. (n.d.). Retrieved August 22, 2021, from <https://www.orfonline.org/expert-speak/inland-waterways-positive-impact-on-economy-60449/>
- International Review of Research in Emerging Markets and the Global Economy (IRREM), An Online International Research Journal (ISSN: 2311-3200).
- Kaiser, H. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31-6.
- Pallant, J. (2013). *SPSS Survival Manual. A step by step guide to data analysis using SPSS*, 4th edition. Allen & Unwin, www.allenandunwin.com/spss. pISSN: 1738-2122, eISSN: 2508-7592
- Port Logistics: Issues & Challenges in India report released*. (n.d.). Retrieved June 20, 2021, from <https://www.jagranjosh.com/current-affairs/dun-bradstreet-releases-port-logistics-issues-challenges-in-india-report-1518509722-1>
- Rathnayake, J., Yan, S., & Karunaratne, J. A. (2021). Inland ports: New dimensions in the transportation structure of Sri Lanka. *International Journal of Logistics Systems and Management*, 39(3), 309–332. <https://doi.org/10.1504/IJLSM.2021.115796>
- Siliguri dry port to start services - Telegraph India*. (n.d.). Retrieved August 23, 2021, from <https://www.telegraphindia.com/west-bengal/siliguri-dry-port-to-start-services/cid/1803598>
- Gekara, V. O., & Nguyen, X.-V. T. (2020). Challenges of Implementing Container Terminal Operating System: The Case of the Port of Mombasa from the Belt and Road Initiative (BRI) Perspective. *Journal of International Logistics and Trade J. Int. Logist. Trade*, 18(1), 49–60. <https://doi.org/10.24006/jilt.2020.18.1.049>
- Kottayam Port and Container Terminal*. (n.d.). Retrieved August 23, 2021, from <https://www.kottayamport.com/>
- Prafulla, W., Sudame, C. P. & Nagorao Bahekar, P. (2015). Article ID: IJM_06_10_003 Cite this Article: Dr. Prafulla W Sudame and Pavan Nagorao Bahekar. A Study of Facilities Available with Respect To Port Operations at Major Port in India. *International Journal of Management (IJM)*, 6(10), 11–17. <http://iaeme.com/Home/issue/IJM?Volume=6&Issue=10http://iaeme.com>
- Ports in India: Market Size, Investments, Economic Development, Govt Initiatives | IBEF*. (n.d.). Retrieved June 21, 2021, from <https://www.ibef.org/industry/ports-india-shipping.aspx>
- Mondragon, A., Mondragon, C. and Coronado, E. (2017) 'ICT adoption in multimodal transport sites: investigating institutional-related influences in international seaports terminals', *Transport Research Part A*, Vol. 97, pp.69–88.
- Lyridis, D. V., & Papaleonidas, C. (2019). Organization and management of tanker shipping companies. *The Routledge Handbook of Maritime Management*, 58–79. <https://doi.org/10.4324/9781315617138-4>
- Marlow, P. B., & Casaca, A. C. P. (2003). Measuring lean ports performance. *International Journal of Transport Management*, 1(4), 189–202. <https://doi.org/10.1016/J.IJTM.2003.12.002>
- Kalwani, MU & Narayandas, N 1995, 'Long-term manufacturer-supplier relationships: do they pay off for supplier firms?', *The Journal of Marketing*, pp. 1-16.
- Alderton, P & Saieva, G 2013, *Port management and operations*, Taylor & Francis.
- Panayides, PM & Song, D-W 2009, 'Port integration in global supply chains: measures and implications for maritime logistics', *International Journal of Logistics: Research and Applications*, vol. 12, no. 2, pp. 133-145.
- Wilmsmeier, G & Notteboom, TE 2011, 'Determinants of liner shipping network configuration: a two-region comparison', *GeoJournal*, vol. 76, no. 3, pp. 213-228.
- Bichou, K & Gray, R 2004, 'A logistics and supply chain management approach to port performance measurement', *Maritime Policy & Management*, vol. 31, no. 1, pp. 47-67.