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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio," Ohio State University.

Contributions to books

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

Journal and other articles

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

Conference papers

- Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2006): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

Online resources

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Website

- Kelkar V. (2009): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on February 17, 2011 http://epw.in/epw/user/viewabstract.jsp

EFFECTIVENESS OF CARGO HANDLING IN VISAKHAPATNAM PORT TRUST – A CASE STUDY

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ABSTRACT

Visakhapatnam Port is one of the leading major ports of India has been playing a vital role in fostering the country's foreign trade and economic development. Port provided immense employment opportunities for the citizens in and around the city. In this paper an attempt has been made to study the effectiveness of cargo handling in VPT. Manpower and machine power usage for handling bulk, dry and liquid cargo, respondents opinion on time consuming for loading, unloading and material handling of cargo have been tested by applying chi-square test and F-test in relation to year of establishment, operational area and type of firms. The results show that machine power usage is more than the manpower for handling bulk, dry and liquid cargo. All the respondents are taking 2-5 days of time for loading and unloading. F-values for time consuming for cargo handling and material handling system in VPT for different years of establishment and operational area are significant at 0.01 level and type of firm is significant at 0.05 level.

KEYWORDS

Cargo, Port, Visakhapatnam, Foreign Trade.

INTRODUCTION

Visakhapatnam Port Trust is one among the 12 major ports of the country. It has acted as a catalyst in the process of industrialization of its hinterland along with other ancillary industries. The port played a dynamic role in faster accelerated development in the region which contributed significantly for the national development. Visakhapatnam port is one of the leading major parts of India has been playing a vital role in fostering the country's foreign trade and economic development. Visakhapatnam was an ancient port city which had trade relations with Middle East and Rome, Ships anchored at open roads and loaded with cargo from Visakhapatnam shore by means of small boats. The construction of Harbor at Visakhapatnam was thought after the transfer of power from East India Company to the crown. Port provided immense employment opportunities for the citizens in and around the city. Port has attracted many industries in its hinterland and this industrialization, further enhanced, employment opportunities to the people of the region. Industries like ship building, old refiner, fertilizer factory, zinc smelter plant, Bharat Heavy Plates and Vessels Limited, Export processing Zone and Steel plant now owe their birth at the city of the port.

The important cargo types namely dry, bulk, liquid and container traffic is confined mainly to the Major Ports. General cargo and special bulk materials such as stones, cement, oil seed extractions, salt, etc. are handled at minor ports as break bulk. The traffic growth in the first half of 2008-09 was a little over seven per cent due to several factors such as fuel price hike, jittery commodities market and less than satisfactory growth in iron ore exports. In 2007-08, the major ports had posted 12 per cent growth at 519.314 million tonnes (mt).

CARO HANDLING FACILITIES

For the purpose of loading and unloading cargo, shifting, tracking of the cargo, the port has fleet of versatile equipment backed by workshop facilities. This fleet consists of electric wharf cranes, mobile cranes, toplift trucks, forklift trucks, tractors and saunters, steel barges etc, with all these equipments the port is able to handle all types of cargo handling heavy lifts.

REVIEW OF LITARATURE

Here a review of literature is made on the aspects related to studies on logistics carried out in India and abroad. A diversity of logistics activities could be find on literature, such as material handling, customer service, transport, inventory, warehousing etc.

Graves (1974)[1] they introduce a multi commodity logistics network design model for optimizing annualized finished product flows from the plants to the DC their to the final customers.

Bowersox, (1978)[2], (Tersine, 1985)[3], Lambert and Stock, (1999)[4] studied that handling is an activity developed inside warehouses with the application of a set of handling equipment which aims: (i) to control the flows and storage of raw-materials, parts and final products that go to warehouses and that move between the several warehouses that belong to the same enterprise; (ii) to eliminate handlings that are unnecessary; (iii) to minimize the distances of moving inside warehouses; (iv) to guarantee an uniform flow without brokens; (v) to minimize losses because of wastefulness; (vi) to avoid breakings; (vii) to decrease the operational expenditures and; (viii) to decrease works' accident.

Tersine (1985)[5] stated that the performance of the logistics activity that embraces the handling and movement of products is positively related with the global performance of the firms, in terms of costs, time, and quality.

C. J. Langley (1992)[6] Casts the evolution of the logistics into three specific contexts; past (1950-1964); present (1965) future. Four stage in development of Logistics function; (1) cost control; (2) profit center orientation recognizes positive impact on sales; (3) view logistics as key to product differentiation; (4) principal strategy revolves around logistics.

Goldratt and Cox, (1993)[7], Tersine, (1985)[8], consider the handling of materials as an activity that does not contribute, strongly, for the value added. This way, its impact should be minimized, through the optimization both of the layout of the warehouses, and the products flow. This allows the firms to reduce the number of operations and movements of materials, whereas the associated cost is also reduced.

Bowersox and Closs, (1996)[9], explained that the logistics can give an important contribution, for example, in the simplification of the flows of information and circulation of the goods and/or services, as well as in the introduction of innovative and more creative processes. Besides, efficient policies of production, marketing and sales always support the efficient use of the logistics practices.

Ratliff and Nulty, (1996)[10] stated that in general terms, logistics activities are all those activities that firms appeal to support their production systems, that is, all activities related with purchase, handling, warehousing and delivery of materials and final products through the supply chain.
Mohammed Abdur Razzaque (1997)[11] the current trend of changes in global business is highlighting the importance of logistics in the development of Third World business and industries. Literature reveals that many of these Third World nations lack logistics facilities; the task of developing a good logistics system in these nations is quite challenging.
Schary, P.B. and T. Skjott-Larsen (1998)[12] stated that logistics management is concerned with managing a series of functional activities beginning with transportation inventory and information management but extending to all activities that involve the management of product movement.
Nevertheless, in the perspective of Prince (1998)[13], the way how the warehouses are managed may contribute for the reduction of operational costs and execution times in logistics. Thus, the use of Integrated Warehouse Management Systems in order to improve its performance is suggested.
Armstrong, Richard (2001)[14] identifies that as trucking prices are largely inelastic, other ways must be identified to reduce expenses for 3PL's. Mode shifting, end to end matching, improved carrier negotiation and shipment visibility are the other major ways. His finding is to reduce costs, aggregate expensive small shipments into larger ones. Timing, stop-offs etc. make aggregation difficult.
K.M.Mittal (2004)[15] observed that flexible logistics management helps in achieving strategic goals. It also results in effective use of resources and improves operations management. In globalization era flexible logistics management can play a major role in developing corporate strategy and coping with change.
Azevedo, (2004)[16] studied about the logistics activities related with the warehousing and handling activities because these activities seems to have more impact on the firm's performance.
Sanyal, (2006)[17] stated that logistics costs (i.e., inventory holding, transportation, warehousing, packaging, losses and related administration costs) have been estimated at 13-14 per cent of Indian GDP which is higher than the 8 per cent of USA's and lower than the 21 per cent of China's GDP.
Ilze Atkacuna, Karolina Furlan (2009)[18] analyzes how TPL firms develop value-added services and to investigate what the driving forces and barriers for developing and providing such services are. In the frame of reference, literature within service management, outsourcing, third-party logistics, value-added services, innovation and learning have been used.

OBJECTIVES OF THE STUDY

1. To examine the nature and effectiveness of cargo handling in Visakhapatnam Port Trust.
2. To offer appropriate suggestions for improvement of the effectiveness of cargo handling in Visakhapatnam Port Trust.

METHODOLOGY

The study is based on both primary and secondary data. The field work for the study was staggered over two months. The primary data for the study are collected by using one elaborate questionnaire for shipping agents which include cargo handling, manpower and machine power used for handling the cargo, time consuming for loading and unloading the cargo etc.

SAMPLING

The study has taken into consideration shipping agents under the Port Trust. Out of the total 177 shipping agents under Visakhapatnam Port Trust a sample of 71 shipping agents which constitute 40 per cent of the total shipping agents have been chosen on purposive basis.
In the second stage the researchers have selected the respondent shipping agents by using random sampling technique.

STATISTICAL TOOLS USED

The primary data have been interpreted with the help of statistical tools such as percentages, chi-square test of significance and F-test.

RESEARCH ANALYSIS AND FINDINGS

TABLE NO 1: DETAILS OF TOXIC AND DANGEROUS MATERIALS HANDLED BY THE PORT

S. no	Variables	Groups	Details of toxic and dangerous materials handled by the port					
			Chemicals	Acid	Gaseous	All the above	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	15(21.1)	21(29.6)	0(0.00)	0(0.00)	36(50.7)	
		1996-2000	28(39.4)	0(0.00)	0(0.00)	0(0.00)	28(39.4)	97.9**(13.3)
		2001-2005	0(0.00)	0(0.00)	0(0.00)	7(9.9)	7(9.9)	
2	Operational area	Indian	21(29.6)	7(9.9)	0(0.00)	0(0.00)	28(39.4)	
		Foreign	0(0.00)	0(0.00)	0(0.00)	7(9.9)	7(9.9)	72.49** (13.3)
		Both	22(31.0)	14(19.7)	0(0.00)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	14(19.7)	0(0.00)	0(0.00)	7(9.9)	21(29.6)	
		Partnership	15(21.1)	0(0.00)	0(0.00)	0(0.00)	15(21.1)	25.89**(13.3)
		Limited/ Pvt Ltd	14(19.7)	21(29.6)	0(0.00)	0(0.00)	35(49.3)	
	Total		**43(60.6)**	**21(29.6)**	**0(0.00)**	**7(9.9)**	**71(100.0)**	

**Significant at 0.01 level

Table no.1 describes the details of toxic and dangerous materials handled by the port. For this a highest majority of the respondents (60.6%) stated that chemicals followed by (29.6%) responded for acid and (9.9%) for all the above dangerous materials. It is surprising to note that port is not handling gaseous and nuclear materials. It is suggested that they should also handled gaseous and nuclear materials for rapid port development.
The calculated chi-square value for year of establishment of firm, operational area and type of firm Vs details of toxic and dangerous material handled by the port is found significant at 0.01 level. This infers that there is a significant relation between the variables and type of materials handled.

TABLE NO 2: MANPOWER USED FOR HANDLING BULK CARGO

S. no	Variables	Groups	Manpower is used for handling the bulk cargo					
			10%-20%	21%-30%	31%-40%	More than 40%	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	7(9.9)	15(21.1)	7(9.9)	7(9.9)	36(50.7)	54.39** (16.8)
		1996-2000	0(0.00)	7(9.9)	21(29.6)	0(0.00)	28(39.4)	
		2001-2005	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
2	Operational area	Indian	7(9.9)	0(0.00)	21(29.6)	0(0.00)	28(39.4)	73.93** (16.8)
		Foreign	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
		Both	0(0.00)	22(31.0)	7(9.9)	7(9.9)	36(50.7)	
3	Type of the firm	Proprietary firm	7(9.9)	7(9.9)	7(9.9)	0(0.00)	21(29.6)	16.34* (12.6)
		Partnership	0(0.00)	8(11.3)	7(9.9)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	7(9.9)	7(9.9)	14(19.7)	7(9.9)	35(49.3)	
	Total		**14(19.7)**	**22(31.0)**	**28(39.4)**	**7(9.9)**	**71(100.0)**	

*Significant at 0.05 level, **Significant at 0.01 level

The table no-2 infers effectiveness of cargo handling regarding manpower used for handling the bulk cargo. It is observed that (39.4%) of the respondents stated that manpower usage is in between 31%-40% followed by (31.0%) responded that 21%-30%, (19.7%) for 10%-20% and (9.9%) for more than 40%. It can be concluded that about 70 per cent of the respondent's man power usage is in between 21%-40%.

The calculated chi-square value is much greater than the table value for the variables year of establishment, operational area and types of firm. We therefore conclude that the above variables have significant relation with the manpower used for handling bulk cargo.

TABLE NO 3: MACHINE POWER USED FOR THE HANDLING OF THE BULK CARGO

S. no	Variables	Groups	Machine power used for the handling of the bulk cargo					
			10%-30%	31%-50%	51%-60%	More than 60%	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	0(0.00)	7(9.9)	8(11.3)	21(29.6)	36(50.7)	18.48** (16.8)
		1996-2000	0(0.00)	0(0.00)	0(0.00)	28(39.4)	28(39.4)	
		2001-2005	0(0.00)	0(0.00)	0(0.00)	7(9.9)	7(9.9)	
2	Operational area	Indian	0(0.00)	0(0.00)	0(0.00)	28(39.4)	28(39.4)	18.48** (16.8)
		Foreign	0(0.00)	0(0.00)	0(0.00)	7(9.9)	7(9.9)	
		Both	0(0.00)	7(9.9)	8(11.3)	21(29.6)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	0(0.00)	0(0.00)	21(29.6)	21(29.6)	40.22** (16.8)
		Partnership	0(0.00)	0(0.00)	8(11.3)	7(9.9)	15(21.1)	
		Limited/ Pvt Ltd	0(0.00)	7(9.9)	0(0.00)	28(39.4)	35(49.3)	
	Total		**0(0.00)**	**7(9.9)**	**8(11.3)**	**56(78.9)**	**71(100.0)**	

**Significant at 0.01 level

The table no 3 indicated regarding machine power used for the handling of the bulk cargo. It is observed that a highest majority of the respondents (78.9%) stated that machine power usage is more than 60% followed by (11.3%) responded 51%-60% and (9.9%) are in between 31%-50%.

The chi-square value for the variables year of establishment of firm, operational area and type of firm Vs machine power used for bulk cargo handling at port is found significant at 0.01 level.

TABLE NO 4: MANPOWER USED FOR HANDLING THE DRY CARGO

S. no	Variables	Groups	Manpower used for handling the dry cargo					
			10%-20%	21%-30%	31%-40%	More than 40%	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	8(11.3)	14(19.7)	14(19.7)	0(0.00)	36(50.7)	23.75** (13.3)
		1996-2000	0(0.00)	21(29.6)	7(9.9)	0(0.00)	28(39.4)	
		2001-2005	0(0.00)	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
2	Operational area	Indian	0(0.00)	21(29.6)	7(9.9)	0(0.00)	28(39.4)	23.75** (13.3)
		Foreign	0(0.00)	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
		Both	8(11.3)	14(19.7)	14(19.7)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	14(19.7)	7(9.9)	0(0.00)	21(29.6)	41.64** (13.3)
		Partnership	8(11.3)	7(9.9)	0(0.00)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	0(0.00)	14(19.7)	21(29.6)	0(0.00)	35(49.3)	
	Total		**8(11.3)**	**35(49.3)**	**28(39.4)**	**0(0.00)**	**71(100.0)**	

**Significant at 0.01 level

Table no.4 gives a picture of manpower used for handling the dry cargo. It is noted that (49.3%) of the respondents stated that they used man power in between 21%-30% followed by (39.4%) are in between 31% to 40% and (11.3%) are in between 10%-20%.

The calculated value of X^2 is more than the table value for the variables year of establishment, operational area and type of firm Vs man power used for handling the dry cargo is found significant at 0.01 level. Hence, the above variables and manpower used for handling dry cargo are not independent.

TABLE NO 5: MACHINE POWER USED FOR HANDLING THE DRY CARGO

S. no	Variables	Groups	Machine power used for the handling the dry cargo					
			10%-30%	31%-50%	51%-60%	More than 60%	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	0(0.00)	7(9.9)	7(9.9)	22(31.0)	36(50.7)	28.91** (13.3)
		1996-2000	0(0.00)	0(0.00)	21(29.6)	7(9.9)	28(39.4)	
		2001-2005	0(0.00)	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
2	Operational area	Indian	0(0.00)	7(9.9)	14(19.7)	7(9.9)	28(39.4)	23.38** (13.3)
		Foreign	0(0.00)	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
		Both	0(0.00)	0(0.00)	14(19.7)	22(31.0)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	0(0.00)	0(0.00)	21(29.6)	21(29.6)	28.12** (13.3)
		Partnership	0(0.00)	0(0.00)	7(9.9)	8(11.3)	15(21.1)	
		Limited/ Pvt Ltd	0(0.00)	7(9.9)	7(9.9)	21(29.6)	35(49.3)	
	Total		**0(0.00)**	**7(9.9)**	**35(49.3)**	**29(40.8)**	**71(100.0)**	

**Significant at 0.01 level

Table no.5 portrays effectiveness of cargo handling regarding machine power used for the handling of the dry cargo. For this (49.3%) of the respondents stated that usage of machine power is in between 51%-60% followed by (40.8%) responded that they are using more than 60% and (9.9%) are in between 31%-50%. The table concludes that 90 per cent of the respondents are using above 50% of machine power for handling of dry cargo.

It shows from the above table that the chi-square values for the variables year of establishment of firm, operational area and type of firm Vs machine power used for dry cargo handling at port is found significant at 0.01 level. This indicates that there is a significant relation between variables and usage machine power for handling dry cargo.

TABLE NO 6: MANPOWER USED FOR HANDLING THE LIQUID CARGO

S. no	Variables	Groups	Manpower used for handling the liquid cargo					
			10%-20%	21%-30%	31%-40%	More than 40%	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	28(39.4)	0(0.00)	8(11.3)	0(0.00)	36(50.7)	8.76* (5.99)
		1996-2000	28(39.4)	0(0.00)	0(0.00)	0(0.00)	28(39.4)	
		2001-2005	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
2	Operational area	Indian	28(39.4)	0(0.00)	0(0.00)	0(0.00)	28(39.4	8.76* (5.99)
		Foreign	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
		Both	28(39.4)	0(0.00)	8(11.3)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	21(29.6)	0(0.00)	0(0.00)	0(0.00)	21(29.6)	33.65** (9.21)
		Partnership	7(9.9)	0(0.00)	8(11.3)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	35(49.3)	0(0.00)	0(0.00)	0(0.00)	35(49.3)	
	Total		**63(88.7)**	**0(0.00)**	**8(11.3)**	**0(0.00)**	**71(100.0)**	

**Significant at 0.01 level, *Significant at 0.05 level

Manpower used for handling the liquid cargo is shown in table no-6. The highest majority of the respondents (88.7%) revealed that they are using manpower in between 10%-20% followed by (11.3%) in between 31%-40%. It is surprising to note that none of the respondents used more than 40 per cent manpower.

The generated chi-square value for the variables year of establishment of firm and operational area Vs manpower used for liquid cargo handling at port is significant at 0.05 level. The other factor type of firm is significant at 0.01 level of significance.

TABLE 7: MACHINE POWER IS USED FOR HANDLING OF THE LIQUID CARGO

S. no	Variables	Groups	Machine power used for handling of the liquid cargo					
			10%-30%	31%-50%	51%-60%	More than 60%	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	7(9.9)	0(0.00)	0(0.00)	29(40.8)	36(50.7)	7.54* (5.99)
		1996-2000	0(0.00)	0(0.00)	0(0.00)	28(39.4)	28(39.4)	
		2001-2005	0(0.00)	0(0.00)	0(0.00)	7(9.9)	7(9.9)	
2	Operational area	Indian	7(9.9)	0(0.00)	0(0.00)	21(29.6)	28(39.4)	11.92* (5.99)
		Foreign	0(0.00)	0(0.00)	0(0.00)	7(9.9)	7(9.9)	
		Both	0(0.00)	0(0.00)	0(0.00)	36(50.7)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	0(0.00)	0(0.00)	21(29.6)	21(29.6)	7.98* (5.99)
		Partnership	0(0.00)	0(0.00)	0(0.00)	15(21.1)	15(21.1)	
		Limited/ Pvt Ltd	7(9.9)	0(0.00)	0(0.00)	28(39.4)	35(49.3)	
	Total		**7(9.9)**	**0(0.00)**	**0(0.00)**	**64(90.1)**	**71(100.0)**	

*Significant at 0.05 level

The table no-7 indicates the effectiveness of cargo handling regarding machine power used for handling of the liquid cargo. A highest majority of the respondents (90.1%) stated that usage of machine power is more than 60% followed by (9.9%) responded that 10%-30%.

Human beings cannot compete with machine power as such man power usage is less than the machine power and it is proved in the study. By observing the table no's 3 and 7 it can be noted that about 80 per cent of the respondents are using above 60 per cent machine power.

The calculated chi-square value for the variables year of establishment of firm, operational area and type of firm Vs machine power used for liquid cargo handling at port is significant at 0.05 level.

TABLE NO 8: RESPONDENT'S OPINION ON TIME CONSUMING FOR LOADING

S. no	Variables	Groups	Time consuming for loading					
			One day	2 – 3 days	4 – 5 days	More than 5 days	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	0(0.00)	14(19.7)	22(31.0)	0(0.00)	36(50.7)	13.19** (9.21)
		1996-2000	0(0.00)	7(9.9)	21(29.6)	0(0.00)	28(39.4)	
		2001-2005	0(0.00)	7(9.9)	0(0.00)	0(0.00)	7(9.9)	
2	Operational area	Indian	0(0.00)	7(9.9)	21(29.6)	0(0.00)	28(39.4)	13.19** (9.21)
		Foreign	0(0.00)	7(9.9)	0(0.00)	0(0.00)	7(9.9)	
		Both	0(0.00)	14(19.7)	22(31.0)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	14(19.7)	7(9.9)	0(0.00)	21(29.6)	16.29** (9.21)
		Partnership	0(0.00)	0(0.00)	15(21.1)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	0(0.00)	14(19.7)	21(29.6)	0(0.00)	35(49.3)	
	Total		**0(0.00)**	**28(39.4)**	**43(60.6)**	**0(0.00)**	**71(100.0)**	

**Significant at 0.01 level

The table no-8 demonstrates the impact of logistics management on the effectiveness of cargo handling regarding time consuming for loading. It is observed that (60.6%) of the respondents stated that time consuming for loading is 4-5 days followed by (39.4%) responded for consuming 2-3 days. It is interesting to note that the respondents are unable to complete the work within one day and they are not taking more than 5 days to complete the work.

The tested chi-square value regarding all the variables Vs time consuming for loading material at port is found significant at 0.01 level. This shows that there is a significant relation between variables and time consuming for loading cargo.

TABLE NO 9: TIME CONSUMING FOR UNLOADING

S. no	Variables	Groups	Time consuming for unloading					
			One day	2 – 3 days	4 – 5 days	More than 5 days	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	0(0.00)	15(21.1)	21(29.6)	0(0.00)	36(50.7)	18.48** (9.21)
		1996-2000	0(0.00)	0(0.00)	28(39.4)	0(0.00)	28(39.4)	
		2001-2005	0(0.00)	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
2	Operational area	Indian	0(0.00)	0(0.00)	28(39.4	0(0.00)	28(39.4	18.48** (9.21)
		Foreign	0(0.00)	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
		Both	0(0.00)	15(21.1)	21(29.6)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	0(0.00)	21(29.6)	0(0.00)	21(29.6)	14.97** (9.21)
		Partnership	0(0.00)	8(11.3)	7(9.9)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	0(0.00)	7(9.9)	28(39.4)	0(0.00)	35(49.3)	
	Total		**0(0.00)**	**15(21.1)**	**56(78.9)**	**0(0.00)**	**71(100.0)**	

**Significant at 0.01 level

Time consuming for unloading is depicted in table no 9. A highest majority of the respondents (78.9%) stated that time consuming for unloading is 4-5 days followed by (21.1%) 2-3 days. It is to be noted that none of the respondents revealed one day and more than 5 days time required for unloading.

Regarding year of establishment of firm, operational area and type of firm Vs time consuming for cargo unloading at port, the chi-square value is greater than the table value and is found significant at 0.01 level. This shows that there is a significant relation between the variables and time consuming for unloading cargo.

TABLE NO 10: RESPONDENT'S OPINION ON TIME CONSUMING FOR CARGO HANDLING

S. no	Variables	Groups	Respondents opinion about time consuming for cargo handling					
			Good	Satisfactory	Average	Poor	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	7(9.9)	29(40.8)	0(0.00)	0(0.00)	36(50.7)	35.37** (9.21)
		1996-2000	0(0.00)	28(39.4)	0(0.00)	0(0.00)	28(39.4)	
		2001-2005	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
2	Operational area	Indian	7(9.9)	21(29.6)	0(0.00)	0(0.00)	28(39.4)	37.83** (9.21)
		Foreign	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
		Both	0(0.00)	36(50.7)	0(0.00)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	7(9.9)	14(19.7)	0(0.00)	0(0.00)	21(29.6)	6.14** (5.99)
		Partnership	0(0.00)	15(21.1)	0(0.00)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	7(9.9)	28(39.4)	0(0.00)	0(0.00)	35(49.3)	
	Total		**14(19.7)**	**57(80.3)**	**0(0.00)**	**0(0.00)**	**71(100.0)**	

**Significant at 0.01 level

Respondent's opinion on time consuming for cargo handling is shown in table no-10. A highest majority of the respondents (80.3%) revealed satisfactory opinion followed by 19.7 per cent responded that it is good. A majority of the respondents (80%) are satisfied on time consuming for cargo handling because due to the high technology and latest equipments available at port reduced the time consuming for cargo handling.

The calculated chi-square value is much higher than the table value for all the variables Vs respondent's opinion on time consuming on cargo handling and is found to be significant at 0.01 level.

TABLE NO 11: RESPONDENT'S OPINION ON EFFECTIVENESS OF MATERIAL HANDLING SYSTEM IN VPT

S. no	Variables	Groups	Effectiveness of material handling system in VPT					
			Good	Satisfactory	Average	Poor	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	7(9.9)	29(40.8)	0(0.00)	0(0.00)	36(50.7)	35.37** (9.21)
		1996-2000	0(0.00)	28(39.4)	0(0.00)	0(0.00)	28(39.4)	
		2001-2005	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
2	Operational area	Indian	0(0.00)	28(39.4)	0(0.00)	0(0.00)	28(39.4)	35.37** (9.21)
		Foreign	7(9.9)	0(0.00)	0(0.00)	0(0.00)	7(9.9)	
		Both	7(9.9)	29(40.8)	0(0.00)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	7(9.9)	14(19.7)	0(0.00)	0(0.00)	21(29.6)	6.14** (5.99)
		Partnership	0(0.00)	15(21.1)	0(0.00)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	7(9.9)	28(39.4)	0(0.00)	0(0.00)	35(49.3)	
	Total		**14(19.7)**	**57(80.3)**	**0(0.00)**	**0(0.00)**	**71(100.0)**	

**Significant at 0.01 level

The table no-11 gives respondents opinion on effectiveness of the material handling system in VPT. For this a highest majority of the respondents (80.3%) stated that material handling system is satisfactory followed by (19.7%) responded that it is good. It is surprising to note that none of the respondents responded for average and poor opinion.

Regarding effective material handling system at VPT and year of establishment of firm, operational area and type of firms the calculated chi-square value are found to be significant at 0.01 level. This shows that there is a significant relation between variables and response towards effective material handling system in VPT.

TABLE NO 12: CONTROLLING IN AND OUT TIMINGS OF VESSELS BERTHING IN PORTS

S. no	Variables	Groups	Controlling of in and out timings of vessels berthing in ports				
			Private agencies	Port authorities	Both	Total	Chi- sqr Value
1	Year of Establishment	Before 1995	0(0.00)	36(50.7)	0(0.00)	36(50.7)	-
		1996-2000	0(0.00)	28(39.4)	0(0.00)	28(39.4)	
		2001-2005	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
2	Operational area	Indian	0(0.00)	28(39.4)	0(0.00)	28(39.4)	-
		Foreign	0(0.00)	7(9.9)	0(0.00)	7(9.9)	
		Both	0(0.00)	36(50.7)	0(0.00)	36(50.7)	
3	Type of the firm	Proprietary firm	0(0.00)	21(29.6)	0(0.00)	21(29.6)	-
		Partnership	0(0.00)	15(21.1)	0(0.00)	15(21.1)	
		Limited/ Pvt Ltd	0(0.00)	35(49.3)	0(0.00)	35(49.3)	
			0(0.00)	**71 (100.0)**	**0(0.00)**	**71(100.0)**	

The table no-12 portrays regarding the control of the in and out timings of vessels berthing in ports. All the respondents (100.0%) stated that port authorities control vessels' berthing in port. The table concludes that the port authorities are playing predominant role in controlling the in and out timings of vessels berthing in port and they are not entrusting this job to any other private agencies.

F-TEST RESULTS

TABLE NO 13: THE PERFORMANCE DIFFERENCE AMONG DIFFERENT YEARS OF ESTABLISHMENT OF DIFFERENT VARIABLES ON CARGO HANDLING

Variables	Year of Establishment	N	Mean	Std. Deviation	Std. Error	F-valu	Sig.
Time consuming for cargo handling	Before 1995	36	2.19	0.40	0.07	33.77**	0.00
	1996-2000	28	2.00	0.00	0.00		
	2001-2005	7	3.00	0.00	0.00		
Material handling System in VPT	Before 1995	36	2.19	0.40	0.07	33.77**	0.00
	1996-2000	28	2.00	0.00	0.00		
	2001-2005	7	3.00	0.00	0.00		

**Significant at 0.01 level

Table no. 13 reveals about the distribution of mean performance among different years of establishment with different factors like time consuming for cargo handling and material handling system in VPT. Mean scores with regarding to the time consuming for cargo handling and material system in VPT is same for the firms which are established before 1995 is 2.19, for firms 1996-2000 mean score is 2.00 and for firms which are established between 2001-2005 the mean score is 3.00.

According to the above table the F-values for time consuming for cargo handling and material handling system in VPT is same for both the variables i.e, 33.77. It may be concluded that variables are significant at 0.01 level.

TABLE NO 14: THE PERFORMANCE DIFFERENCE AMONG DIFFERENT OPERATIONAL AREAS OF DIFFERENT VARIABLES ON CARGO HANDLING

Variables	Operational area	N	Mean	Std. Deviation	Std. Error	F-value	Sig.
Time consuming for cargo handling	Indian	28	2.25	0.44	0.08	38.79**	0.00
	Foreign	7	3.00	0.00	0.00		
	Both	36	2.00	0.00	0.00		
Material handling System in VPT	Indian	28	2.00	0.00	0.00	33.77**	0.00
	Foreign	7	3.00	0.00	0.00		
	Both	36	2.19	0.40	0.07		

**Significant at 0.01 level

The table no.14 describes about the distribution of mean performance among different operational areas respondents. With regarding the time consuming for cargo handling for Indian operational area firms the mean value is 2.25, foreign 3.00 and both types of firms 2.00. As regarding material system in VPT with respect to India, foreign and both type of firms the mean values are 2.00, 3.00 and 2.19 respectively.

The calculated F-values for time consuming for cargo handling and material handling system at VPT are 38.79 and 33.77 respectively. Hence it may be concluded that above variables are significant at 0.01 level.

TABLE NO 15: THE PERFORMANCE DIFFERENCE AMONG DIFFERENT TYPE OF THE FIRMS OF DIFFERENT VARIABLES ON CARGO HANDLING

Variables	Type of the firm	N	Mean	Std. Deviation	Std. Error	F-value	Sig.
Time consuming for cargo handling	Proprietary firm	21	2.33	0.48	0.11	3.22*	0.05
	Partnership	15	2.00	0.00	0.00		
	Limited/Pvt ltd	35	2.20	0.41	0.07		
Material handling System in VPT	Proprietary firm	21	2.33	0.48	0.11	3.22*	0.05
	Partnership	15	2.00	0.00	0.00		
	Limited/Pvt ltd	35	2.20	0.41	0.07		

*Significant at 0.05 level

The table no.15 concludes that the distribution of mean performance among different types of firms of shipping agents under VPT regarding time consuming for cargo handling and material handling system the means score is same for the all the types of firms. The mean score for proprietary firm is 2.33, partnership firm is 2.00 and limited/pvt ltd is 2.20.

According to the above table the F-values for time consuming for cargo handling and material handling system in VPT is same i.e 3.22. Hence they are significant at 0.05 level.

CONCLUSIONS AND SUGGESTIONS

1. 60.6 per cent of the respondents handled chemicals and none of the respondents handled gaseous and nuclear material. It is suggested that they should also handled gaseous and nuclear materials for rapid port development.
2. About 70 per cent of the respondent's manpower usage for handling bulk cargo is 21%-40%.
3. Nearly of 80 per cent of the respondents are using more than 60% of machine power for handling bulk cargo.
4. Nearly 90 per cent of the respondents are using manpower for handling the dry cargo is in between 21%-40%.
5. The researchers revealed that the majority of 90 per cent of the respondents are using above 50 per cent of machine power for handling dry cargo.
6. It is surprising to note that 88.7 per cent of the respondents using only 10%-20% man power for handling liquid cargo.
7. It is interesting to note that 90 per cent of the respondents using more than 60 per cent of machine power for handling of the liquid cargo.
8. It is to be noted that the respondents are unable to complete the work within one and they are not taking more than 5 days to complete the work.

9. It is observed in the research that none of the respondents revealed one day and more than 5 days time required for loading and unloading. All the respondents are taking 2-5days of time for loading and unloading. It is suggested that port authorities should make necessary arrangements to the respondents to complete loading and unloading in one day at least for few materials.
10. According to the research majority of the respondents 80 per cent are satisfied on time consuming for cargo handling because due to the high technology and latest equipments available at port reduced the time consuming for cargo handling.
11. Regarding respondent's opinion on effectiveness of material handling system in VPT 80.3% respondents stated satisfactory and 19.7 per cent responded good.
12. F-values for time consuming for cargo handling and material handling system in VPT for different years of establishment is same for the both the variables i.e, 33.77. It may be concluded that variables are significant at 0.01 level.
13. The calculated F-values for time consuming for cargo handling and material handling system at VPT regarding operational areas are 38.79 and 33.79 respectively. Hence, it may be concluded that the variables are significant at 0.01 level.
14. F-values for time consuming for cargo handling and material handling system in VPT for proprietary firm , partnership firm, and limited/Pvt ltd is same i.e 3.22. The variables are significant at 0.05 level.

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