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A STUDY ON BERTH AND DEPTH OF MAJOR PORTS IN INDIA

Dr.B.MANIVANNAN M.Com., M.B.A., M.Phil., PhD.

Assistant Professor

Department of Commerce

Aringar Anna Government Arts College

Villupuram.

Abstract

The ports are very significant in India because of economic growth of India is depends on Sea Transport and it is a principal constituent to the international trade. Indian ports met rapidly expanding traffic, handling more than a billion tonne of cargo for example 2013-14 the major ports accounted for 57.11 per cent (555.50 MT) of the cargo by volume. This underlines the importance of sustaining the growth and development of ports. Berth generally is used for handling of cargoes which are classified bulk berth, container berth, general berth, coal berth, Iron ore berth and fertilizer berth. Total number of berth is 239 in all the 12 major ports in India. The general berth depth is lowest among the other types of berth and it is between 8mtrs to 12.5mtrs. The traditional major port of Kolkata, Mumbai and Chennai are declining performance due to inadequate berth and depth of the port. So, the researcher concludes that Indian port authority should take the steps to increasing the depth of the berth for using mother vessels.

Key Words: Port, Berth, Vessel, International trade, and Depth

I. Introduction

India has 13 major ports; six ports in west coast another six ports are east coast but one port is located in Andaman Nicobar Island. All the major ports are seaports except in Kolkata, because it is located in Hooghly river of West Bengal. Apart from this major ports India has a 200 non-major ports but out of which only about 48 non major ports are performed or supporting the trading activities remaining 152 non-major ports are using as fishing harbour. The Indian ports are handled different type goods like, containers, fertilizers, iron-ore, agro-product, pharma product, petroleum and its allied products. The target of new manufacturing policy growth rate in India is from 16 per cent to 25 per cent, it is to be attained through the increasing of international trade. The ports are very significant in India because of Indian sea port are covering 90 per cent of trade volume via major ports so, economic growth of the nation and the international trade of India is depends on Sea Transport and it is a principal constituent. Historically, the port is a place for landing the ship, like loading and unloading the different types of cargo by on common

berth of the port. But increasing the MNC they want to specialisation of berth with modern equipment that is terminalisation of ports with focus towards freight specialization.

II. Importance of the Ports

The trade between the countries is an indicator of its economic condition of the nations. The international trade of a country fulfills the requirements of its different regions and also promotes balanced regional growth in the country. Indian ports are the gateways to India's international trade by sea. India has naturally coastline of about 7521 km excluding of Andaman Nicobar. The impact has been very positive in India as GDP growth rate projected to achieve 9.5 per cent growth rate during the 12th plan period. As Indian ports gear up of handling the increased import and export basket of India's manufactured products, petroleum products, agricultural products and minerals. Indian ports are one of the few emerging economies in globally. Sea route is comfortable for bulk commodities, especially for chemical goods and the transport expenses of goods are reasonable compare with the other mode of transport. Indian ports were met rapidly expanding traffic, handling more than a billion tonne of cargo for example 2013-14 the major ports accounted for 57.11 per cent (555.50 MT) of the cargo by volume and it is expected to rise 2.5 billion tonnes by 2025. This is underlines the importance of sustaining the growth and development of ports and their contribution to the Indian economy.

The electricity and energy industry growth depend on coal because it is one of the most significant raw materials in development of Indian energy sectors but it is transported via sea route so, Ports are the most important trade point for importing of coal and fertilizer. The central government is faced the deficit situation, that is increasing the coal demands of the producers of iron, steel, fertilizer, and energy sector. This has widened the gap between the demand and supply has led to an increase in the dependence of seaports of the country for imports. Sea route is comfortable for exporting and importing bulk commodities, coal, iron ore, and chemical goods because it best to avoiding environment pollution and also easy transport. So, Ports are very important for international trade activities but establishing of specialized berthing facility is need for fulfilling the growth of import and export of cargo. However, in India has the following berth facility of various major ports.

III. Types of Berth

The berth infrastructure of the sea port is very significant to handling of cargoes of international trade, especially country's growth. The Indian port sectors play important role in handling of resources of the energy industry of the nation, such as, coal product, petroleum product, and gas products. The berthing infrastructure of the seaport is a basic facility of the port for handling the cargoes. The important purpose of berthing facilities is to facilitate a ships approach and mooring process specifically the berth connected to shore to ship.¹ Berth generally is used for handling of cargoes which are classified on the nature of goods handled, like bulk berth, container berth, general berth, coal berth, Iron ore berth and fertilizer berth.

¹ Common Mooring Methods Used for Ships, Abhishek Bhanawat, March 17, 2018, <https://www.marineinsight.com/marine-navigation/mooring-methods-ships/>

(i) Bulk Berth

Bulk berth is used to handle either, dry cargoes or liquid bulk cargoes. It handles the cargoes through using excavators, conveyer belt, and pipelines. The bulk berth has a storage facility for the cargo but it is to be maintained together with the berth. The dry bulk includes fertilizer, coal, and Iron product.

(ii) Container Berth

The containers berths are used to load and unload the standard inter model containers. The Vessels of this berth are handled by container cranes and it is designed specifically for this task. The container berth has large areas of land for container handling near the berth and also it must have the significant equipments and the dock to facilitate fast movement of container on and off the vessels.

(iii) Liquid Berth

Liquid berth is used to operate crude oil and gas related products. It is located offshore to keep the safe zone of operation from the rest of other port operations. The vessels of liquid berth are loaded with loading arms containing the pipeline facilities. The liquid cargo is pumped back to shore through the pipeline which is usually attached with the berth. The storage facility of the liquid berth is situated usually distance away from the berth and is connected by pipelines.

IV. A Study of Berth of the Port

In India, Central Government has to control the major ports and initiate the policies for the establishment of the berth. But each port has a specialization in handling the specialized cargoes like Paradip port, especially for handling of iron ore, JNPT is for container handling and Kandla is for POL product. However, the table 1 shows that the berth facilities of the major ports in India.

TABLE 1
Number of Berthing Facilities in Major Ports

Name of the Port / Berth	General / Multipurpose	Container Berth	POL / OIL	COAL Berth	IORN ORE Berth	Fertilizer Berth	Ro-Ro Berth	LPG Berth	Passenger Berth	Total
KDS	21	4	7	-	-	-	-	-	1	33
HDC	11	-	3	3	-	-	-	-	-	17
PPT	8	-	2	2	-	2	1	-	-	15
VPT	17	1	5	2	-	1	-	-	-	26
ChPT	5	7	4	2	-	4	1	-	1	24
TPT	8	1	2	3	-	-	-	-	1	15
CPT	6	3	3	-	-	2	-	-	-	14
NMPT	5	-	5	6	-	-	-	1	-	17
MoPT	4	-	6	-	1	-	-	-	-	11
MPT	14	6	6	-	-	2	-	-	1	29
JNPT	-	7	5	-	-	-	-	-	-	12
KPT	14	-	11	-	-	1	-	-	-	26
Total	113	29	59	18	1	12	2	1	4	239
Percentage	47.27	12.13	24.67	7.53	0.48	5	0.98	0.48	1.65	100

Source: Compiled by the researcher from Port association Reports.

The table reveals that number of berth availability in various major ports in India and it also explain the nature of berth. It understood that general multipurpose berth occupying the 47.27 percent of total berth and it is highest number of berth compare with the other types of berth. POL berth is the second position and container berth is the third position. The table is also reveals that remaining berthing facilities of India is not in important position because they are less than 10per cent.

The general and multipurpose berth of the port is handled for all types of the goods for example this type of the berth have been loading and unloading of general goods, coal, iron ore and also containerised goods. The multipurpose berths are the major occupancy of all the major ports in India. From the table the researcher found that the east coast port of KDS, HDC and VPT are the highest number of 21, 11 and 17 general berth facility. The west coast MPT and KPT having highest of 14 berth each.

The containerized cargo export and import is very important for safe guard of nature and quality of goods as well as easy handling. India JNPT and Chennai ports are the special port for handling of containerized goods and it has 7 berths each with modern equipment for handling of containerised cargoes. The JNPT is the number one port in India for handling of containerized goods because of its advantages.

All the major ports in India having POL handling berth and the table reveals that Kolkata and Visakhapatnam are important port for handling of Petroleum, Oil and liquid product in east coast. But, all the six ports of west coast are handling of POL product because of these ports are has a direct shipment facility with special equipment for handling of oil product. However, KPT port is the number one port in India with modern POL handling facilities.

Coal is important material for energy producing and iron steel industry. All the state government having electricity production companies and using the coal for heating purpose but six major port of India are not having specialized coal handling berth but it handled the coal by using the multipurpose berth, it leads the problems of sea water pollution and more turnaround time. The interpretation the researcher understood that the west coast port should be establish the specialized coal berth for reducing coal handling cost and save the time, except New Mangalore port. The remaining six major ports are having specialized berth for handling of coal cargoes and the New Mangalore port is number one port for having highest number of coal berth among the other port.

All the major ports are handling the iron ore product through general multipurpose berth except Marmagao port and it having specialized berth for handling of iron ore product. The Marmagao port is a number one port among the other port for handling of highest iron ore.

In India 12 berths is a special berth for handling of fertilizer product, out of which 4 berth in Chennai port other 8 berth is in VPT, PPT, CPT, MPT and KPT. The other major port importing the fertilizer generally from general berth, hence it leads the problems of increasing the cost of fertilizer and its affect the nature of general goods because of its chemical nature.

V. Analysis of Depth of the ports

TABLE 2
Depth Level of Major Port in India

Name of the Port	Nature of the Berth	Number of Berth	Depth of the berth		Vessel Handling Capacity of the Berth (Ton)
			Minimum	Maximum	
Kolkata Port	General /Multipurpose	22	8Mtrs.	8.7Mtrs.	25000 ton
	Container	4	8Mtrs.	8.7Mtrs.	25000 ton
	POL	7	9.1Mtrs.	13.7Mtrs.	38000 ton
Haldia Port	General /Multipurpose	11	10Mtrs.	12.2Mtrs	75000ton
	POL	3	12.1Mtrs	12.5Mtrs	150000ton
	Coal	3	12.2Mtrs	12.2mtrs	75000ton
Paradip Port	General /Multipurpose	8	11mtrs	14.5mtrs	95000ton
	Iron Ore	2	13mtrs	13mtrs	70000ton
	Coal	2	14mtrs	14mtrs	80000ton
	Fertilizer	2	12.5mtrs	12.5mtrs	95000ton
	Ro-Ro	1	5Mtrs	5Mtrs	10000ton
Visakhapatnam Port	General /Multipurpose	16	10mtrs	12.5mtrs	45000ton
	Container	1	14.5mtrs	14.5mtrs	45000ton
	POL	5	10mtrs	12.5mtrs	150000ton
	Iron Ore	2	16.5mtrs	16.5mtrs	150000ton
	Coal	2	11mtrs	11mtrs	50000mtrs
	Fertilizer	1	10.1mtrs	10.1mtrs	30000ton
Chennai Port	General /Multipurpose	8	8.5mtrs	12mtrs	70000ton
	Container	8	12mtrs	13.4mtrs	150000
	POL		14.5mtrs	16.5mtrs	140000ton
	Fertilizer	4	11.5mtrs	12mtrs	50000ton
	Ro-Ro				
Tuticorin Port	General /Multipurpose	9	9.3mtrs	12.8mtrs	80000ton
	POL	2	12.8mtrs	12.8mtrs	75000ton

	Coal	3	12.8mtrs	12.8mtrs	75000ton
	Container	1	10.9mtrs	10.9mtrs	30000ton
Cochin Port	General /Multipurpose	9	9.1mtrs	12.5mtrs	60000ton
	Container	2	14.5mtrs	14.5mtrs	100000ton
	POL	2	9mtrs	10mtrs	35000ton
NMPT Port	General /Multipurpose	5	7mtrs	9.5mtrs	30000ton
	POL	6	12.5mtrs	14mtrs	85000ton
	Coal	6	14mtrs	14mtrs	90000ton
Mormugoa Port	General /Multipurpose	4	13.1mtrs	14.5mtrs	70000ton
	POL	6	14.1mtrs	14.1mtrs	70000ton
	Iron Ore	1	14.1mtrs	14.1mtrs	275000ton
Mumbai Port	General /Multipurpose	14	8.84mtrs	9.14mtrs	35000ton
	Container	7	8.84mtrs	9.14mtrs	35000ton
	POL	6	11mtrs	14.30mtrs	125000ton
	Fertilizer	2	8.84mtrs	9.14mtrs	35000ton
JNPT Port	Container	7	10mtrs	14mtrs	150000ton
	POL	5	8mtrs	14mtrs	1500000ton
Kandla Port	General /Multipurpose	13	9.8mtrs	12.5mtrs	65000ton
	Container	15	12.5mtrs	13mtrs	75000ton
	POL	10	9mtrs	14mtrs	65000ton
	Fertilizer	1	16.2mtrs	16.2mtrs	100000ton

Source: Compiled by the researcher from Port association Reports.

The above table reveals that total number of berth is 239 in all the 12 major ports in India. The general berth depth is lowest among the other types of berth and it is between 8mtrs to 12.5mtrs. So, its shipping capacity is minimum 25000ton and maximum 80000ton. Other types of berth depth are more than the general berth like upto 18mtrs and its shipping capacity is 150000ton.

All the 12 major ports in India have maintained different types of berth, like General berth, container berth, POL Berth, Coal berth, Iron Ore berth and Fertilizer berth. Indian Major Ports are normally maintained by General berth, Container berth and POL berth. However all types of cargoes are handled by all the ports through multipurpose berth or general berth of the port. It leads to increasing the expenses as well as turnaround time of the ship in Indian major ports compared with the international ports. However, the following findings and suggestions are found from the analysis.

VI. Findings and Suggestions of the Study

The multipurpose berths are the major occupancy of all the major ports in India. However, the general berth number in Chennai port, MOPT port and JNPT port are the less than the container and POL berth, because these ports are concentrating the specialised of cargo loading. From the interpretation the researcher found that traditional major port of India is having more number of general and multipurpose berths. It may be due to the lack of sufficient investment to converting of specialized berth or otherwise there is no opportunity to develop because of policy restriction. Multipurpose berth lead to increasing the turnaround time and take more time to loading and unloading of goods because of same equipment used for all types of goods. Hence, the researcher recommends that the central government and the port authorities should be implement and invest to for special berth to handling of containerized goods otherwise the Indian port are not compete with other nation.

In India five major ports are not having container berth and two ports are having only one berth each. So they handled containerized cargo in general berth therefore cargo handling cost, time for loading and unloading of cargo are increased. So the business people are not willing to use the general berth for handling of containerized goods. Therefore researcher suggests that all the major port should be established a container berth because of in future heavy and bulky good are also transported through container.

The general berth depth is lowest among other berth of the all ports. The container berth lowest depth is 8mtrs in Kolkata port because this port is riverine port but 14.5mtrs is a highest depth in Cochin port, which is more than the specialized container berth depth of JNPT port. However JNPT container berth cargo handling maximum capacity is 150000tons, it may be in the reason of modern container handling equipment and mechanisation. It is understood that depth alone is not improving the performance of the port. So, the port authority makes the steps to increasing the depth with special equipment for increasing the efficiency of the port.

Increasing the petroleum consumption of the people is cause for increasing the POL berth of the Major Port in India because of government has the responsibility to fulfil the demand of petroleum product through importing via ports. In addition Government is restricting to control the environment pollution in sea through POL product handling. So all the major port are created separate specialized POL berth with modern facility. The POL berth depth of the west coast port is 14mtrs to 14.5mtrs and east coast depth is between 9mtrs to 18mtrs. It reveals that the POL berth depth is highest depth among the other berth and so POL berth of the major port is handling big ships or mother vessels.

Indian Major Ports still not upto the international port for example Shanghai port has 225 berths for handling of various types of cargoes and it has direct connectivity with more than 500 ports. But in India maximum number of the berth is 33 in Kolkata port, minimum 12berth in JNPT port and majority of the Indian Major Port are not direct connectivity with the other countries because they are not handling mother vessels. So, the present study suggests that Indian port authority should make necessary steps to developing

the new berth with modern equipment for handling of mother vessels with more number of ships at one time.

The Indian ports are using transshipment of goods to other international ports because of lower depth of the Indian port and it increasing the expenses of cargoes. Therefore, Indian government should make more investment to increasing the berth and depth of the major port because it alone allowing the mother vessels. Using of mother vessels by the port may increase the efficiency and makes to handle more number of ships at one time.

Presently, pre berthing and turnaround time of the port is 3 to 6 days in India but world best port time is 5 hours to 2 days. It is due to lack of equipment, lower depth, absence of specialization and also minimum number of berthing in the port. Increasing the time consumption of Indian Major Port they losing his opportunity to handling of goods and it went to private port.

Majority of Indian people depends on agriculture activities but supply and demand gap of fertilizer is still is very to. So, the government of India is importing finished and raw fertilizer from various countries for development of agriculture activities through general multipurpose berth. But it leads the problems of sea water pollution and affecting the non -chemical nature goods. Therefore researcher recommend that port authority should establish the separate berth for chemical goods in all the major ports.

VII. Conclusion

Indian ports are most significant in development of Indian international trade. But, the traditional major port of Kolkata, Mumbai and Chennai are declining performance after independence and new major port cargo handling performance are increasing. For example JNPT port and Kandla port in India occupying the top ranking among the major port. The declining performance of the Indian major port is due to inadequate infrastructure, lessor number of special berth with lower depth. It impact the vessel handling capacity of the berth is low and also do not implementing modern facility. So, the researcher conclude that Indian port authority should take the steps to increasing the depth of the berth for using mother vessels and some general cargo handling berth may converted into specialized cargo berth. Because it reducing the cargo handling expenses and increasing the cargo handling capacity of the port. Therefore berth and depth of the major port are major influencing factor for development of port performances.

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