“A STUDY ON CONTAINERIZED CARGO TRADE IN INDIA”

Submitted for partial fulfilment of the requirement for the degree of

MASTER OF BUSINESS ADMINISTRATION

in

International Transportation and Logistics Management

by

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May 2022

DECLARATION

I, **Praveen Kumar**, Registration No:2003305023, hereby declare that this project report titled **“A STUDY ON CONTAINERIZED CARGO TRADE ININDIA”** is a bonafide record of work carried out by me under the supervision of**Dr. A Mourougane Assistant Professor** School of Maritime Management, Indian Maritime University, submitted in partial fulfilment of the requirements for the award of the degree of **MASTER OF BUSINESS ADMINISTRATION IN (International Transport and Logistics Management)**. The information submitted is true to the best of my knowledge.

Date: May 2022

Place: Chennai Praveen Kumar.P

CERTIFICATE

School of Maritime Management

Indian Maritime University, Chennai.

This is to certify that the project report entitled "**A STUDY ON CONTAINERIZED CARGO TRADE IN INDIA"**, submitted to the School ofMaritime Management, Indian Maritime University, Chennai Campus., in partial fulfilment for the award of the degree of Master of Business Administration International Transportation and Logistics Management, is a record of work carried out entirely by **Praveen Kumar**, Reg No: **2003305023.**

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2022

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- Praveen Kumar.P

EXECUTIVE SUMMARY

A Study on Containerized Cargo Trade in India

Degree: Master of Business Administration, International Transportation and Logistics Management

Despite the number of studies on the efficiency of container ports, most studies are of developed nations, and very few are of developing nations, such as India. Indian container ports are very critical due to their location advantage and their ability to handle transhipment traffic. There is a need to understand their performance at the micro-level, specifically the terminal level rather than that of the whole port. This paper focuses on the analysis of the technical efficiency of 26 container terminals in India and interprets it with respect to location advantage, administrative control and private control of terminal operations.

This study enabled the ranking of these terminals in terms of their performances. The relative efficiency of container terminals on the west coast of India is found to be better than that of the east coast of India, and the efficiency of container terminals operating under major ports is on a declining path when compared with that of minor ports. The private participation has also not seen similar productivity changes across all container terminals. Among the seven high performing container terminals identified through the analysis provided, the terminal at Tuticorin emerged as the most consistent one in terms of relative efficiency and growth in total factor productivity. The dominant factor influencing the efficiency of a terminal is found to be the size of the terminal, offering the advantages of economies of scale.

ABBREVIATION

RTG - Rubber-Tired Gantry

RMG - Rail-Mounted Gantry

MOS - Ministry of Shipping

JNPT - Jawaharlal Nehru Port Trust

DEA – Delivery Estimate Accuracy

DPD - Direct port delivery

AEOs - Authorized economic operators

DPE - Direct port entry

CAGR – compound annual growth rate

RMG - Readymade Garments

CONCOR - Container Corporation of India

ASR - Additional Service Request

NMG - Nhava Sheva – Mundra-Gulf

ULCV - Ultra large container vessels

JNCPT - Jawaharlal Nehru Port Container Terminal

EIR - Equipment Interchange Receipt

RFID - Radio frequency identification technology

AMCT - Adani Mundra Container Terminal

CITPL - Chennai International Terminals Pvt Ltd

TEU - Twenty-foot equivalent units

NSIGT - Nhava Sheva (India) Gateway Terminal

E-RTGs - Electrical Rubber-Tired Gantry cranes

MICT - Mundra International container terminal

GCR - Gross crane rate

CCT - Chennai Container Terminal

CRRS - Container rail service

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CHAPTER I

INTRODUCTION

1.1 Background and Significance of Study:

International sea freight container transit has risen substantially in recent years, and container terminals play an important part in the worldwide shipping network. Terminal operations are gaining attention in the scientific literature, and operations research methodologies are increasingly being utilised to increase efficiency and production.

1. Port efficiency is a critical prerequisite for survival in the competitive shipping sector. Seaports are complex dynamic systems with various interacting parts that are impacted by random causes. As a result, the effective administration of operations and the maximum exploitation of available resources are two primary aims. Many objectives will be met under these two aims, including boosting port throughput and use of resources (berths, cranes, quays, yards, etc.), lowering handling time, minimising port congestion, disturbances, demurrage, and operating expenses.

2. A container terminal is a port zone where ships dock on berths and containers are loaded, unloaded, and stored in a buffer area known as the yard. Containers are picked up and delivered by trucks and trains in an area known as a gate in import-export terminals, but in transhipment terminals, containers are transferred between ships known as mother vessels and feeders using a hub-and-spoke arrangement.

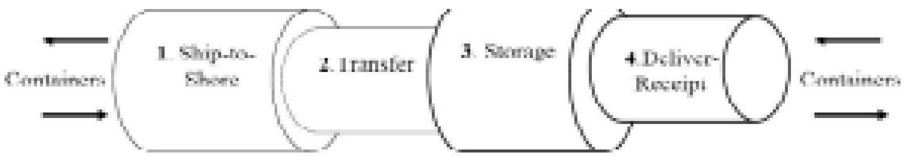


Fig-1.1 Process of Operations in container terminal

Figure 1 Depicts the primary subsystems and operations of a container terminal. Containers for import, export, and transhipment are yard components. Rubber-Tired Gantry (RTG) cranes, Rail-Mounted Gantry (RMG) cranes, reach stackers, chassis-based transporters, and straddle carriers are the most typical cranes utilised in a container yard. RMG cranes are the only ones that can handle fully automated containers.

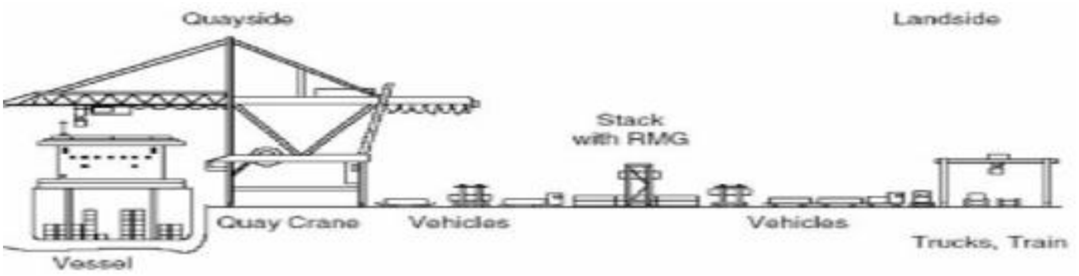


Fig 1.2 Typical container terminal

1.2 Overview of India's Ports

Ports serve as a logistical platform for receiving and transporting cargo from one location to another. Because of the country's low economics, Indian ports handle nearly 95 percent of India's foreign commerce, which represents for 70 percent in terms of volume. From 2018 to 2020, they handled 1208 million metric tonnes of cargo, with a 20% share of containerised cargo (Ministry of Shipping (MoS), 2020), and in 2020, Indian container ports alone handled 2% of worldwide container port throughput (Nightingale, 2019). Container handling by Indian ports began in 1973 at the Mumbai and Cochin ports on India's west coast, and as demand grew, container traffic climbed eightfold. When compared to which has expanded by a factor of three over 45 years (Ministry of Shipping (MoS), 2019). The Jawaharlal Nehru Port Trust (JNPT) is the most consistent port in terms of throughput among all Indian container ports, and it has been ranked in the top 30 container ports in the world since 2003.

The worldwide container market is undergoing significant transformations. Vessel upscaling to capitalise on economies of scale, optimal capacity utilisation, enhancing the role of alliances and industry consolidation, and demand and supply mismatch leading to freight rate reductions are altering the dynamics of global container shipping. As a result, Indian container ports will be forced to accept larger vessels, overcome connection bottlenecks, and modernise infrastructure, consequently enhancing operational efficiency.

In this context, the Indian government launched a programme called "Sagarmala" in 2015 to integrate coastal development, with the goal of increasing container traffic to 25 million TEUs by 2025 (Ministry of Shipping (MoS) (2019)). New feeder ports in Andra Pradesh, West Bengal, on the east coast, and new transhipment ports (Colachel, Vizhinjam, and Enayam) on the west coast are deemed necessary to meet increased traffic, capacity, and efficiency upgrades for current ports. Increasing the number of container ports without utilising the current ones is not a viable approach for fulfilling demand.

The most cost-effective way to meet the increased demand is to improve the efficiency of existing container terminals and upgrade their capacity, which is frequently determined by several factors such as time spent by the ship in port, cargo handling, hinterland connectivity, and port superstructure and infrastructure, among others.

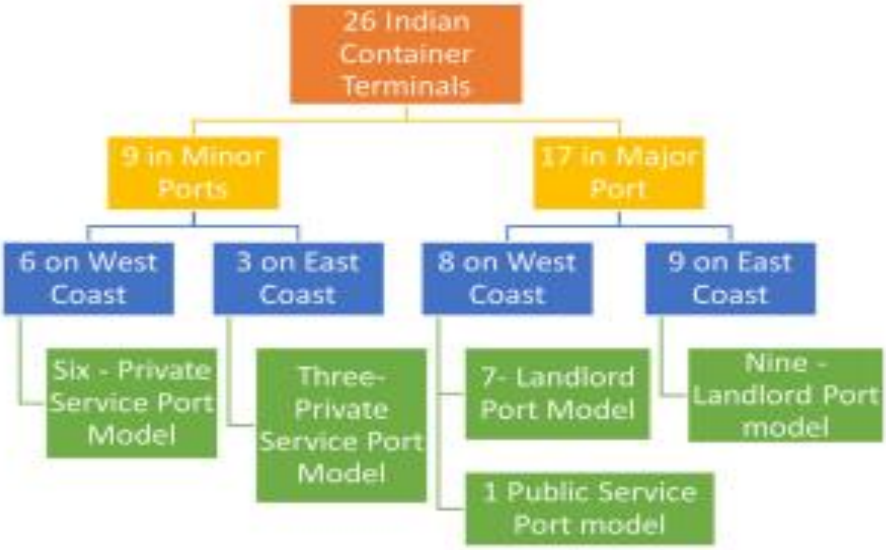


Fig 1.3 Classification Container Terminals in India

1.3 Indian Container Terminals:

There are 26 Indian container terminals operating throughout the country's 7517 km of coastline, with 14 on the west coast and 12 on the east. In terms of administrative control, 17 of the 26 container terminals are classed as major ports, while the remaining 9 are designated as minor ports (Fig. 1). The distinction between major and minor ports is based on strategic importance and administrative authority. Major ports are administered by the Ministry of Shipping and are governed by the Indian Ports Act 1908 and the Major Port Trusts Act 1963, whilst minor ports are handled by state government marine bodies. Port governance in India is shifting from a service port model to a landlord port model, and full privatisation has not been recommended due to a perceived monopoly in commerce and logistics.

Appendix A lists the classification of Indian container terminals based on their location, administration, and governance, as well as the information of each container port. If a port authority owns and manages the facilities, superstructure, labour, and other operations, the port model is defined as a public service port. These approaches prioritise the public's interests.

When the activities are administered by a private organisation, the port authority acts as a regulator. The landlord port concept is based on a combination of public and private interests. A private service port is one that is controlled, maintained by a private company, and focuses on private interests. When it comes to container throughput market segmentation, the share of big ports is dropping when compared to the share of small ports, owing to private terminal operator growth. From 2007 to 2019, big ports lost a 41 percent share of throughput to lesser ports. Container ports such as Kattupalli and Krishnapatnam have substantially boosted their output.

Throughput of container terminals (East vs West Coast). Source: Data compiled from Indian container market data in 2019 vs 2015, corresponding to the performance of the Mundra and Pipavav ports. Container terminals at small ports had a 74 percent rise in throughput from 2015 to 2019, compared to container terminals in big ports, which saw a 14 percent increase.

This is due to the market participation of private firms, infrastructural enhancements, and the handling of bigger boats. According to the comparison research, container ports on the west coast have a bigger percentage of throughput than terminals on the east coast.

Despite the advanced infrastructure on west coast terminals, the total increase in throughput is somewhat higher in east coast terminals (42 percent) than in west coast terminals (41%), which might be due to effective resource utilisation. Container terminals on the east and west coasts handled, on average, 23% and 8% of transhipment cargo, respectively. When compared to 2015, the throughput of container ports managed by the Adani Group (126 percent), the JM Baxi Group (175%), the Krishnapatnam Port (418 percent), and the Dakshin Bharat Gateway (406 percent) increased dramatically in 2018. (Behera, 2015, 2018). When compared to their throughput in 2020, APM Terminals had a 3% decline in 2018.

Terminals run by DP World, JNPT, and PSA have improved by 10%, 15%, and 18%, respectively. Inefficiencies in terminals raise transaction costs. Private businesses have joined the container port industry, and it is necessary to analyse their efficiency in their different terminals in order to comprehend their increased throughput and optimise logistics and transaction costs. Private operators have handled transhipment goods as a result of recent Indian reforms such as cabotage relaxation, competitive prices, infrastructure upscaling, and so on.

Container terminals under big ports must take the initiative to acquire market share from other ports, and they must overcome obstacles such as congestion, infrastructure, vessel draught, and price. The disparities in growth might be ascribed to their location, governance, and administrative control. As a result, there is a need to evaluate the efficiency of container terminals operating in large ports vs. small ports, east coast vs. west coast, in order to find the top performing terminals. Study motivation and contribution Extensive study is being conducted to better understand the performance, productivity, and efficiency of major ports in India.

1.4 Literature Review

The majority of research have concentrated on optimising single processes rather than the entire container terminal as a system. The following are the primary logistic procedures inside a container terminal: berth allocation, stowage planning, quay crane assignment, quay crane scheduling, yard crane scheduling, storage and stacking police, rail operations, truck operations, and intertransports.

Models are classed as deterministic, stochastic, static, or dynamic depending on the process. The complexity of the terminal processes stems from various interactions between operations and a range of stochastic processes (e.g., ship arrival rates, timeframes necessary for each stage of container movement, equipment maintenance times, equipment failure times, number of containers loaded and unloaded). Simulation models may completely represent the system and are long-lasting. Analytical modelling of container terminals, on the other hand, entails creating mathematical models and equations that characterise various stages in the system's operation. The fundamental issue with container terminal analytical models is that they lack depth and adaptability, and so simplify the real scenario.

As a result, for a more thorough assessment, it is necessary to compare container terminals rather than ports, emphasising the significance of this research. Some of the researchers that studied the effectiveness of Indian ports took into account 2–3 inputs and 1–2 outputs for a sample of 13 major Indian ports. This is a violation of the DEA's guideline for a minimum sample size. The number of inputs evaluated in this study is 5, with throughput as the output fulfilling the DEA criterion. This study adds to the literature because no similar research has been conducted addressing the Performance and Container Handling Throughput of India's whole list of container terminals.

1.5 Scope of the Study:

It is critical to consider the port and terminal while analysing the performance of container terminals. The following port aspects are included by these studies: berth length, the length of the place where the vessel may park; quay crane, equipment to load and unload containers; draught, the depth of the vessel bottom from the waterline; and yard infrastructure. The following aspects are frequently included in analyses of yard infrastructure: container yard, the location where containers are stored, handed over to agencies, and collected from agencies; yard equipment, which includes the number of rubber tyre gantry cranes and rail-mounted gantry cranes for hoisting containers; and reefer points, the number of slots for refrigerated containers that handle temperature-controlled goods. Most researches have used throughput as an output variable and length of quay, quay cranes, and yard equipment as input factors. The variables addressed in this study must encompass the inputs under terminal infrastructure and yard infrastructure in order to quantify efficiency in terms of throughput, which is the number of containers that a terminal can handle.

Most studies employed throughput as an outcome variable and quay length, quay cranes, and yard equipment as input variables. In order to measure efficiency in terms of throughput, which is the number of containers that a terminal can handle, the variables considered in this study must include inputs under terminal infrastructure and yard infrastructure.

1.6 Objectives of the Study.

• The primary aim of this study is to conduct a containerization analysis of export and import in relation to Indian ports.

• To examine the terminal growth pattern in terms of container throughput in India.

• Research the vertical integration of shipping corporations and terminal operators.

1.7 Limitations of the Study

- There are numerous methods and metrics for determining terminal performance. The primary performance indicators of the port and terminals are considered in this study.
- This paper makes no claim to have investigated all parameters from all dimensions.
- It is created based on the current situation. If the conditions change, the terminal's performance and consequences will vary. The data used for this study is collected only from the certain interests and Various reports and Publishing.

1.8 Chapter Characterization

This research study consists of five chapters, and the structure follows as:

Chapter 1

Introduction

Discuss about the Indian Ports, Container terminals, literature review, Scope of the study and Chapter Characterization.

Chapter 2

Analysis of Indian Container Market

In depth study about the Major Export in India with respect to containerization and analysis about the Major port review

Chapter 3

Analysis of import commodities in India

In depth study about the Major Imports in India with respect to containerization and analysis about the Major port review

Chapter 4

Performance evaluation of selected container terminals

Analysis about Performance Indicators and Ranking with respect to Container shipping in India also the Vertical integration between Shipping companies and Terminal Operators.

Chapter 5

Summary and conclusion

Finding –Conclusion and Suggestion.

CHAPTER 2

2.1 Introduction about Container Market in India

With various legislative reforms in place, the Indian container sector is experiencing incremental double-digit growth year on year, boosting the container trade against the global slump. Improvements in transhipment numbers at Indian ports, direct port delivery (DPD), direct port entry (DPE), an increase in authorised economic operators (AEOs), port community systems (PCS), digitization and automation of cargo movement through port gates, and other key areas of improvement are notably aiding the market's upward trend. Healthy competition among large and private ports is boosting container traffic increase at each port year over year.

In fiscal year 2018-19, overall throughput of Indian container ports reported was 16.99 million TEU, representing a 10.5% increase year on year. In the same year, total installed capacity is 28.65 million teus, with capacity utilisation of 60%. West coast ports account for 66% of total Indian capacity while providing 72% of total Indian container volumes, mostly due to the main container terminals of JNPT and Mundra. East coast ports handled 28% of total Indian container volume out of 34% of total Indian container capacity.

2.2 Indian Container Market Overview

In 2018, India surpassed France and the United Kingdom to become the world's fifth largest economy, surpassing France and the United Kingdom in the World Bank list. Although China's container throughput increased by a single digit over the previous three years, India's container throughput increased by 11.4 percent in 2018. Except for one or two unlucky ports, all Indian ports grew throughout the year. Overall, India's container traffic has increased dramatically over the previous four years, with a CAGR of about 12%.

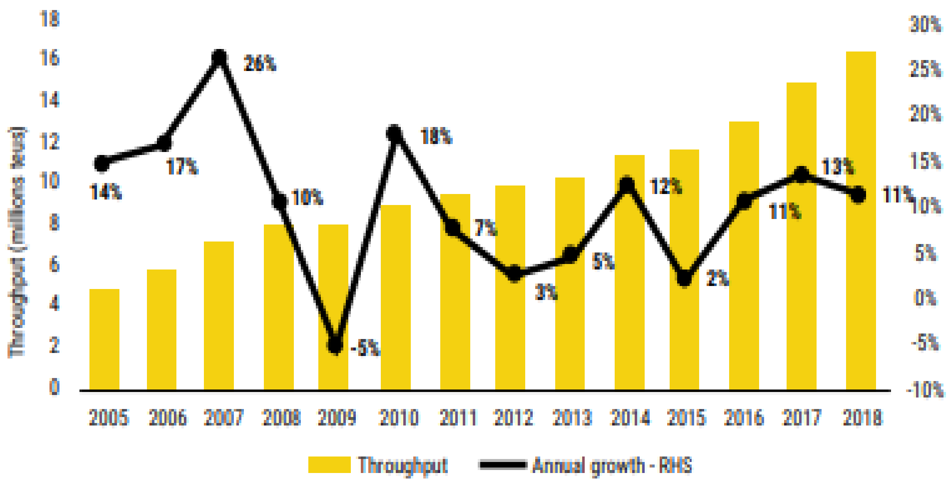


Fig 2.1 Development of Container Traffic in India

2.3 Market Segmentation -2019

Major Vs Non-major ports

In the previous decade, big ports have consistently lost a considerable percentage of container traffic to non-major ports. Non-major port market share has expanded more than fivefold in the previous 14 years (since 2005). Major ports' market share fell from 92 percent in 2005 to 58 percent in 2018. The rapid growth of private terminal operators in non-major ports diverted a substantial amount of cargo. Non-major port market share increased to a staggering 42 percent in 2018 from a meagre 8 percent in 2005.

Krishnapatnam and Katupalli on India's east coast have gathered substantial cargo in the last four/five years, contributing to the development narrative of non-major ports formerly led by Mundra and Pipavav. The largest Indian port, JNPT, showed a strong close to 8% increase in 2018, the greatest year-on-year growth in the prior four years. Nonetheless, its proportion has dropped to about half in the previous 15 years. Mundra is on its way to becoming the largest stakeholder in overall container traffic, having handled 11% more boxes in 2018 than the previous year. Mudra’s percentage of total container traffic was just 3% lower than that of the major port, JNPT

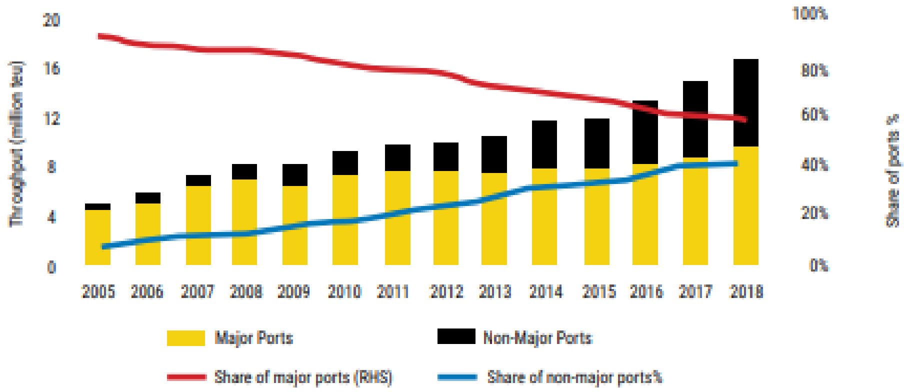


Fig-2.2 Rising share of Non – Major Ports

East coast ports Vs west coast ports

West coast ports will continue to dominate total container traffic as well as container infrastructure. The west coast ports handle around 72 percent of the country's cargo flow.

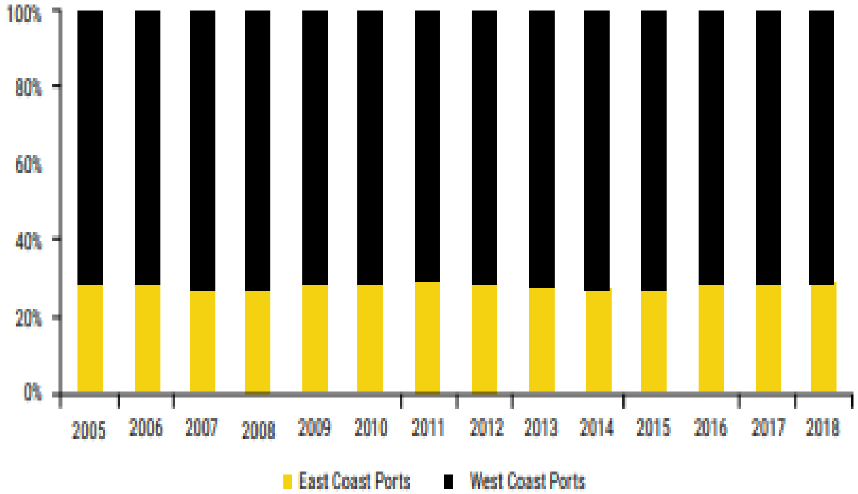


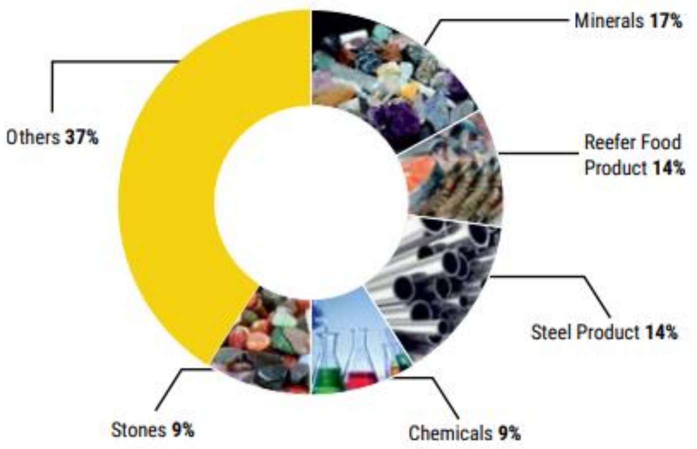
Fig-2.3 Containers Handled at West and East coast Ports

2.4 Major containerised/containerisable Exim cargo

We categorised all traded commodities into 33 broad categories for investigation, including Pharmaceuticals, Fabric/Yarn, Steel Products, Reefer Food Products, and Readymade Garments (RMG)/Textiles. Because no authorised source provides accurate classifications of containerised and non-containerised freight, the data contains some subjectivity. In contrast to the trade values published in the 2018 edition of the Containers India report, we used cargo volume (tonnes) as our foundation of analysis in this year's study.

In terms of volume, the biggest product group exported from India is different mineral goods that are either containerised or containerisable. In 2018, this product group accounted for 17% of India's total containerised or containerisable exports. This product group's export volume climbed about 20 times throughout the decade, from 4.5 million tonnes in 2008 to 19.8 million tonnes in 2018. Reefer food goods follow minerals and account for 14% of India's overall exports. Rising demand for fish and meat has led to an expansion in commercial fish and animal production in India over the years. According to the statistics we have, the export volume of reefer foods has surged fivefold over the last decade, from 4.6 million tonnes in 2008 to 15.6 million tonnes in 2018.

Fig-2.4 Major Commodities Exported from India



On the import side, the chemical category is the most important group of goods imported into India. The country imported 24.7 million tonnes of chemicals in 2018, up from 6.8 million tonnes in 2008. Steel and steel products are the second most important imports in India. Steel product demand in the country has remained strong due to growing industrial and infrastructure demands. Imports of steel products rose from 12.4 million tonnes in 2008 to 20.5 million tonnes in 2018. Similarly, the country's expanding income levels have raised demand for imported food goods. Food imports climbed thrice during the decade, reaching 18.8 million tonnes in 2018.

Fig 2.5 India's Top 20 Export Destinations in 2018

Rank 2008	Rank 2018	Trend	Country	Share in India's total exports
1	1	→	China	15.7%
4	2	↑	Bangladesh	6.5%
3	3	→	United States	6.0%
33	4	↑	Oman	5.4%
17	5	↑	Nepal	5.0%
2	6	↓	United Arab Emirates	4.0%
5	7	↓	Vietnam	3.7%
7	8	↓	.Korea, Rep	3.3%
9	9	→	Saudi Arabia	3.1%
10	10	→	Malaysia	2.6%
59	11	↑	Maldives	2.6%
8	12	↓	Indonesia	2.3%
26	13	↑	Qatar	2.0%
14	14	→	Thailand	1.9%
13	15	↓	Italy	1.9%
6	16	↓	Japan	1.7%
16	17	↓	United Kingdom	1.6%
12	18	↓	Belgium	1.5%
11	19	↓	Sri Lanka	1.5%
18	20	↓	Netherlands	1.3%

In terms of imports, China, the United States, and Indonesia have remained first, second, and third throughout the previous decade, respectively. In 2018, China supplied 12 percent of India's demand, followed by the United States (7.1 percent) and Indonesia (6.8 percent). Table 2 shows a notable trend in which the country has begun to import more from Southeast Asian countries over the last decade. Malaysia, for example, rose from tenth place in 2008 to sixth place in 2018. Singapore rose from 17th place in 2008 to 8th place in 2018. Similarly, Thailand rose from 19th place in 2008 to 9th place in 2018.

2.5 Top Commodity Partner Matrix with respect to India's Export

As previously stated, minerals are the product group with the largest percentage of India's exports. More than 63 percent of all mineral exports go to the top five countries. China, South Korea, Saudi Arabia, Japan, and the United States are among them. Reefer food items are the second most important export. The Middle East and North Africa are the primary demand drivers for Indian beef. They import more than half of India's reefer products, with Oman being the largest consumer. Among counties in other regions, Maldives is the major consumer of India'sreeferproduct.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	World Exports	Top 5 share
Minerals	China	South Korea	Saudi Arabia	Japan	USA		
	7.8	1.7	1.2	1.0	0.9	19.8	63.3%
Reefer food Products	Oman	Maldives	Qatar	Vietnam	UAE		
	5.3	2.2	0.9	0.9	0.6	15.6	63.8%
Steel Products	Nepal	UAE	Italy	USA	Belgium		
	2.3	1.1	1.1	0.8	0.8	15.6	38.5%
Chemicals	China	Saudi Arabia	Malaysia	USA	Indonesia		
	2.4	0.7	0.6	0.6	0.6	10.4	46.7%
Stones	China	Bangladesh	Maldives	UK	USA		
	4.2	3.2	0.7	0.6	0.2	10.1	88.0%
Fabric/Yarn	China	Bangladesh	Pakistan	USA	Turkey		
	0.9	0.7	0.4	0.3	0.3	5.3	50.6%
Polymer and polymer Products	China	USA	Italy	Turkey	UAE		
	0.9	0.3	0.2	0.2	0.2	4.6	39.6%
Sugar	Sudan	Myanmar	Sri Lanka	Somalia	Netherlands		
	0.6	0.4	0.3	0.3	0.2	3.3	53.5%
Ceramic Products	Saudi Arabia	Nepal	UAE	Iraq	Oman		
	0.4	0.2	0.2	0.1	0.1	2.9	35.8%
Ores and concentrates	Nepal	China	Saudi Arabia	Bangladesh	Japan		
	0.8	0.3	0.2	0.2	0.1	2.3	69.8%

Fig – 2.6 India's Top Export Products and their respective top destination,2020 (Million Tonnes)

Chapter 3

3.1 Major Commodities Imported by India in 2020

On the import side, the chemical category is the largest group of goods imported into India. In 2020, the country imported 24.7 million tonnes of chemicals, up from 6.8 million tonnes in 2008. Steel and steel products are the second most important imports into India. Steel product demand in the country has remained strong due to rising industrial and infrastructure demands. Imports of steel products climbed from 12.4 million tonnes in 2008 to 20.5 million tonnes in 2018. Similarly, growing income levels in the country have raised demand for imported food goods. Imports of food goods grew thrice throughout the decade, reaching 18.8 million tonnes in 2019.

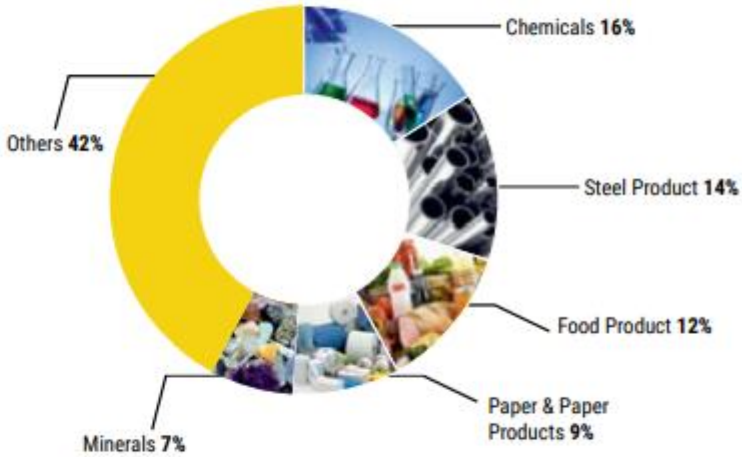


Fig- 3.1 Major Commodities imported by India in 2020

3.2 Major Trade Partners with respect to India's Import:

On the import side, China, the United States, and Indonesia have maintained their top, second, and third positions throughout the previous decade. In 2020, China supplied 12 percent of India's demand, followed by the United States (7.1 percent) and Indonesia (6.8 percent). Table 2 shows that during the last decade, the country has begun to import more from Southeast Asian countries. Malaysia, for example, rose from 10th to 6th place in 2008. Singapore rose from 17th to 8th place in 2008. Similarly, Thailand rose from 19th in 2008 to 9th in 2018.

3.2 India's Top 20 Import Sources in 2018

Rank 2008	Rank 2018	Trend	Country	Share in India's total imports
1	1	→	China	12.1%
2	2	→	USA	7.1%
3	3	→	Indonesia	6.8%
8	4	↑	UAE	5.9%
6	5	↑	South Korea	4.9%
10	6	↑	Malaysia	4.3%
9	7	↑	Saudi Arabia	3.7%
17	8	↑	Singapore	3.2%
19	9	↑	Thailand	2.7%
18	10	↑	Iran	2.6%
16	11	↑	Japan	2.4%
37	12	↑	Brazil	2.4%
12	13	↓	Ukraine	2.4%
5	14	↓	Canada	2.3%
51	15	↑	Bhutan	2.1%
7	16	↓	Oman	2.1%
4	17	↓	Russia	2.0%
13	18	↓	UK	1.7%
33	19	↑	Argentina	1.7%
56	20	↑	Vietnam	1.6%

3.3 Top Commodity Partner Matrix

Chemical items are the most frequently imported cargo by India. In 2020, the country imported 24.7 million tonnes of chemicals, with half of the total coming from its top five import sources. China, the United States, Singapore, Saudi Arabia, and Malaysia are among them. Steel products are India's second most important commodity category. In 2018, more than half of the import requirements were derived from the top five nations, with nearly 18% imported from South Korea alone, followed by China (13 percent).

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	World Imports	Top 5 share
Chemicals	China	USA	Singapore	Saudi Arabia	Malaysia		
	3.4	3.2	2.0	1.9	1.5	24.7	48.6%
Steel Products	South Korea	China	UAE	Japan	USA		
	3.8	2.8	1.8	1.6	1.0	20.5	53.5%
Food Products	Indonesia	Ukraine	Malaysia	Argentina	Brazil		
	7.5	3.0	2.9	2.5	0.8	18.8	89.1%
Paper and Paper Products	USA	Canada	UK	China	Russia		
	4.2	1.1	0.9	0.6	0.5	13.8	52.9%
Minerals	UAE	Bhutan	Thailand	Qatar	Oman		
	3.6	3.0	0.6	0.6	0.5	11.2	74.7%
Polymer and Polymer prod-ucts	China	South Korea	UAE	Singapore	Saudi Arabia		
	1.5	1.2	0.8	0.8	0.7	10.4	48.7%
Reefer food products	Myanmar	USA	Russia	Canada	Australia		
	0.6	0.4	0.4	0.4	0.3	5.5	38.4%
Aluminum & aluminum products	China	UAE	USA	Malaysia	UK		
	0.4	0.3	0.3	0.3	0.2	2.8	50.2%
Rubber and rubber prod-ucts	Indonesia	UK	South Korea	USA	Thailand		
	0.3	0.3	0.2	0.2	0.2	2.4	50.4%
Sugar	Brazil	China	USA	Pakistan	Netherlands		
	2.2	0.0	0.0	0.0	0.0	2.3	97.5%

Fig 3.3 India's Top Imported Products and Their respective top destination ,2020

3.4 Cost Components with respect to Imports

VARIABLE COST COMPONENTS - IMPORTS			
Service Provider	Cost Components	Port Names	
		JNPT (Cost)	Mundra (Cost)
Shipping Line / Port/Terminal	Demurrage Charges	USD 110/day/contr +	USD 110/day/contr +
	Detention Charges	USD 110/day/contr +	USD 110/day/contr +
	Maersk - THC	Rs 6,615	Rs 16,020
	MSC -THC	Rs 11,375/40"	Rs 10,850/40"
	CMA CGM - THC	Rs 7,800	Rs 15,500
	One Line - THC	Rs 6,800- 7,950	Rs 12,500
	Hapag-Lloyd - THC	Rs 6,900	NA
	B/E Charges	Rs 2,800-4,500	Rs 2,800-4,500
	Lift on/lift off - ICD cost	INR 1,000-2,000	INR 1,000-2,000
Inland Transportation	Road transporation Cost	INR 10,000 (ICD - Factory)	INR 10,000 (ICD - Factory)
	Energy Charges	20 ft - Rs 250, 40 ft - Rs 350	20 ft - Rs 250, 40 ft - Rs 350
	Storage charges- Ground rental	After 15th day, Rs 350 - 20 ft, Rs 700 - 40 ft	After 15th day, Rs 350 - 20 ft, Rs 700 - 40 ft
	Rail Transportation Cost	INR 55,000-80,000/40"	INR 55,000-1,00,000/40"
Dry ports	ICD Charges	INR 15,000/40	INR 10,000-15,000/40

Fig 3.4 – Cost Components with respect to JNPT and Mundra

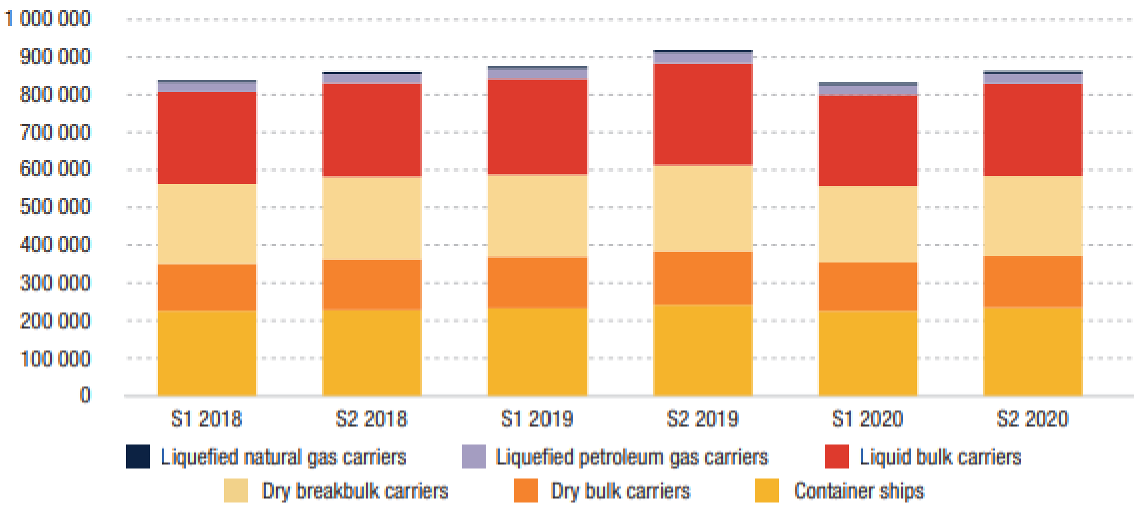
Chapter:4

Key Performance Indicators for Ports and Shipping Fleet

4.1Port Calls and Turn Around Times

During the first six months of 2020, cargo-carrying ships as a whole made fewer port visits, indicating the pandemic-induced drop in demand for shipping and port services (figure 4.1). 1 In the second part of the year, all regions showed a recovery, but not to pre-pandemic levels. Europe, East Asia, and South-East Asia had the most ship arrivals (figure 4.2)

Figure 4.1 Port calls per half year, world total, 2018–2020



Source: UNCTAD, based on data provided by MarineTraffic.
Ships of 1,000 GT and above. Not including passenger and Ro/Ro ships.

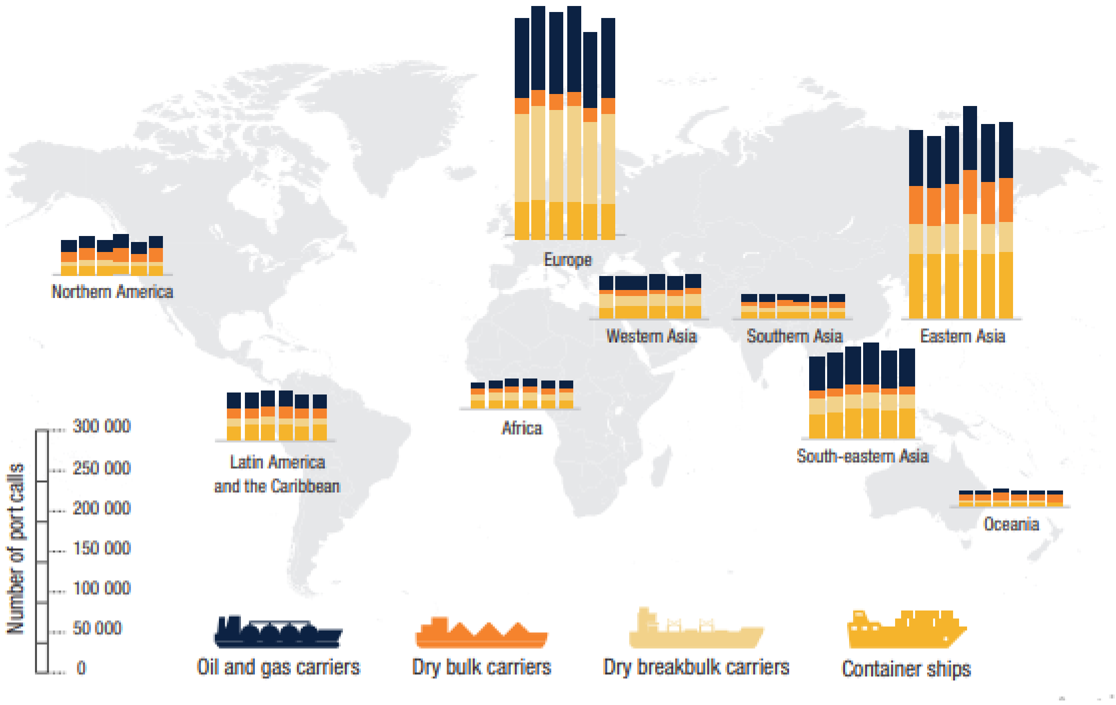
Total Installed Capacity

28,650,000 TEUs

Total Throughput

16,996,323 TEUs

Figure 4.2 Port calls per half year, regional totals, 2018–2020



4.2 Terminals Ranking as per FY 2019-2020

Ranking	Port Code	Name	TEUs
1	**APMT-M**	APM Terminals Mumbai	2,048,454
2	**AICT**	Adani International Container Terminal	1,918,070
3	**JNPCT**	Jawaharlal Nehru Port container Terminal	1,056,368
4	**AMCT**	Adani Mundra Container Terminal	1,051,298
5	**CITPL**	Chennai International Terminal	963,167
6	**NSIGT**	NhavaSheva India Gateway Terminal	938,512
7	**APMT-P**	APM Terminals Pipavav	903,344
8	**MICT**	Mundra International Container Terminal	835,825
9	**ACMT**	Adani CMA Mundra Terminal	740,786
10	**CCTL**	Chennai Container Terminal	653,675
11	**BKCT**	Bharat Kolkata Container Terminal	652,000
12	**ICTT**	Vallarpadam International Container Transhipment Terminal	594,592
13	**KICT**	Kattupalli International Container Terminal	592,399
14	**NSICT**	Nhava Sheva International Container Terminal	560,661
15	**AHCT**	Adani Hazira Container Terminal	559,330

16	**BMCT**	Bharat Mumbai Container Terminal	520,110
17	**NCT**	Navayuga Container Terminal	506,168
18	**VCTPL**	Visakha Container Terminal	450,406
19	**DBGT**	Dakshin Bharat Gateway Terminal	386,376
20	**TCT**	PSA SICAL Tuticorin Container Terminal	352,010
21	**KICT**	Kandla International Container Terminal	244,371
22	**HICT**	Haldia International Conatiner Terminal	178,262
23	**NMPT-C**	New Mangalore Port- (Container)	131,613
24	**AECT**	Adani Ennore Container Terminal	56,987
25	**MPT-C**	Mormugao Port-Containers	37,000
26	**MbPT-C**	Mumbai Port	27,202
27	**KCTI**	PSA-Kakinada Container Terminal	24,337
28	**PICT**	Paradip Port-Containers	13,000

4.3 PERFORMANCE OF INDIAN CONTAINER TERMINALS (FY 2019-20)

Names	Volume Handled	Annual Growth
APM Terminals Pipavav	Medium	High
Mundra International Container Terminal	Medium	Low
Adani Mundra Container Terminal	High	Medium
Adani International Container Terminal	High	High
Adani CMA Mundra Terminal	Medium	High
Adani Hazira Container terminal	Medium	High
Kandla International Container Terminal	Low	High
Jawaharlal Nehru Port Container Terminal	High	Low
Nhava Sheva International Container Terminal	Medium	Low
Nhava Sheva India Gateway Terminal	Medium	High
APM Terminals Mumbai	High	Low
Bharat Mumbai Container Terminals	Medium	High
New Mangalore Port - (Containers)	Low	High
Mormugao Port –Containers	Low	High
Vallarpadam International Container Transhipment Terminal	Medium	High
Paradip Port – Containers	Low	High
Chennai Container Terminal	Medium	Low
Chennai International Terminal	Medium	Medium

Adani Ennore Container Terminal	Low	High
Visakha Container Terminal	Low	High
Navayuga Container Terminal	Medium	Medium
Kattupalli International Container Terminal	Medium	High
Bharat Kolkata Container Terminal	Medium	Low
Haldia International Container Terminal	Low	High
PSA SICAL Tuticorin Container Terminal	Low	Low
Dakshin Bharat Gateway Terminal	Low	High
PSA - Kakinada Container Terminal	Low	High
Mumbai Port	Low	Low
Reference	**Volume(Mi TEUs)***	**Annual Growth**
Low	0-0.5	<5%
Medium	0.5-1	5-10%
High	>1	10%+

Mi TEUs - Million Twenty Foot Equivalent Units

Reference	Volume(Mi TEUs)*	Annual Growth
Low	0-0.5	<5%
Medium	0.5-1	5-10%
High	>1	10%+

4.4 Sailent Features and Key performance efficiency of India's Container Terminals

APM TERMINALS MUMBAI

APM Terminals Mumbai has the greatest throughput of any Indian container terminal, reaching 2.05 million TEUs in fiscal year 2019-2020, surpassing the 2 million handled number for the second year in a row. This terminal is the busiest in the country, with a capacity utilisation rate of 102.5 percent. This facility is a joint venture between APM Terminals and the Container Corporation of India (CONCOR), with 74 percent and 26 percent ownership, respectively. APMT Mumbai is moving toward digitalization, which opens up new options.

In the fiscal year 2019-2020, the terminal established a Web interface to make doing business easier for DPD clients. The terminal's new function, Additional Service Request (ASR), has been introduced to the web portal. This functionality will replace the manual system and claims to be straightforward and transparent for clients. Because of the strong base of container volume handled, the terminal increased its volume by 1.01 percent over the previous year.

The gross crane productivity is 29.26 movements per hour, while the berth productivity is 101.37 moves per hour. For fiscal year 2019-20, the terminal has purchased and installed 14 new RTGs with spreaders.

For the previous five years, the compound annual growth rate (CAGR) has been 1.7 percent. Import volume is 1.08 million TEUs and export volume is 0.96 million TEUs, with exports increasing significantly. The terminal handled transhipment traffic of 28,884 TEUs at JNPT, as well as coastal freight of 31,075 TEUs, a significant increase over previous year's tonnage. APM Terminals also welcomed the Nhava Sheva – Mundra – Gulf (NMG) service, a weekly service linking numerous ports in the Middle East, with the rotation being APM Terminals Mumbai – Mundra – Khalifa – Jebel Ali – Sohar. Import and export services can be ordered online, as well as other services such as priority delivery, seal repair, inter-terminal transfers, and empty container storage (ASR). APM Terminals Mumbai has a competitive advantage over its competitors owing to its control over service digitalization. As a result, the firm has achieved industry-leading productivity rates and consistent growth.

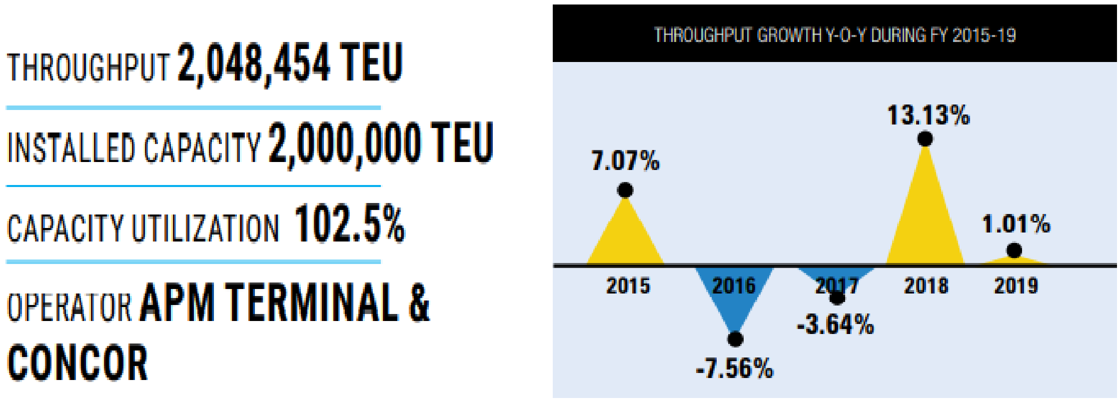


Fig 4.3 Performance of APM TERMINALS MUMBAI

ADANI INTERNATIONAL CONTAINER TERMINAL

AICTPL is a partnership between APSEZ and Terminal Investment Limited (Terminal arm of Mediterranean Shipping Company, the second largest shipping liner in the world). With 15 Super Post Panamax Quay cranes and 45 eRTG, AICTPL has a total quay length of 1,460 metres and a cargo handling capability of 3 million TEUs. It serves as a transshipment point for the Middle East, South Asia, and India. It can handle ultra-large cargo boats because to its deep draught of 17 metres (ULCV).

AICTPL handled 1.93 million TEUs in FY 2018-19, exceeding the previous year tonnage of 1.57 million TEUs, representing a 23 percent increase. In comparison to FY 2017-18, growth in average berth productivity and gross crane rate is 9 percent and 13 percent, respectively. By successfully managing MSC MARGRIT, AICTPL has set a new productivity milestone. A total of 6797 movements / 9667 TEUs were successfully accomplished, breaking the previous record of 6286 moves in MSC BRUXELLES in Sep-17.

In addition, a new berth productivity (BMPH) record of 252.14 movements per hour was set in MSC ESTHI, breaking the previous mark of 230.14 mph set in Oct-18. AICT has completed VMT Driven terminal operations. It has also implemented Remote Terminal In-gate, upgraded its Terminal Operating System from ACTOS to IPOS, begun the usage of E-ITV for terminal operations, which is in the testing phase, and has berth extension and the deployment of more quay cranes as continuing expansions.

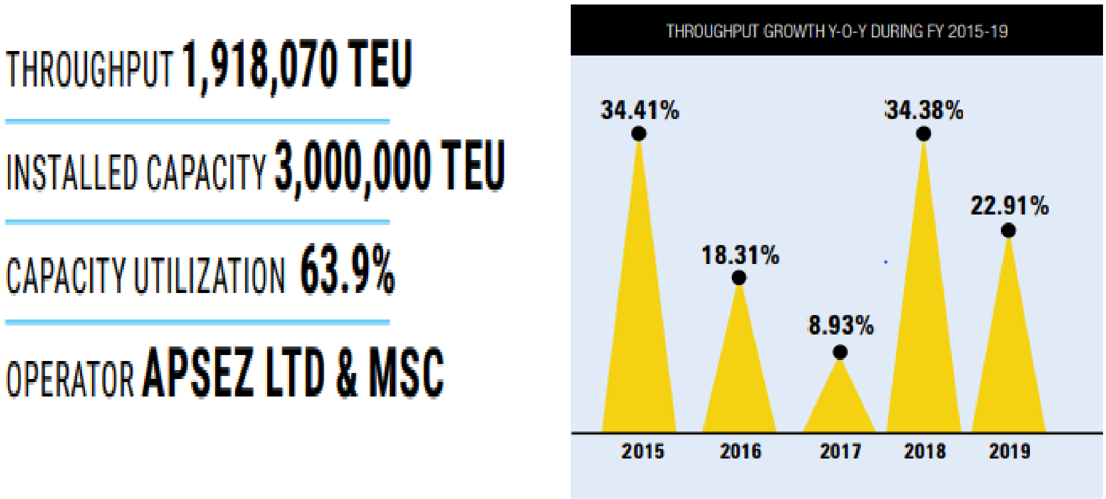


Fig 4.4 Performance of ADANI INTERNATIONAL CONTAINER TERMINAL

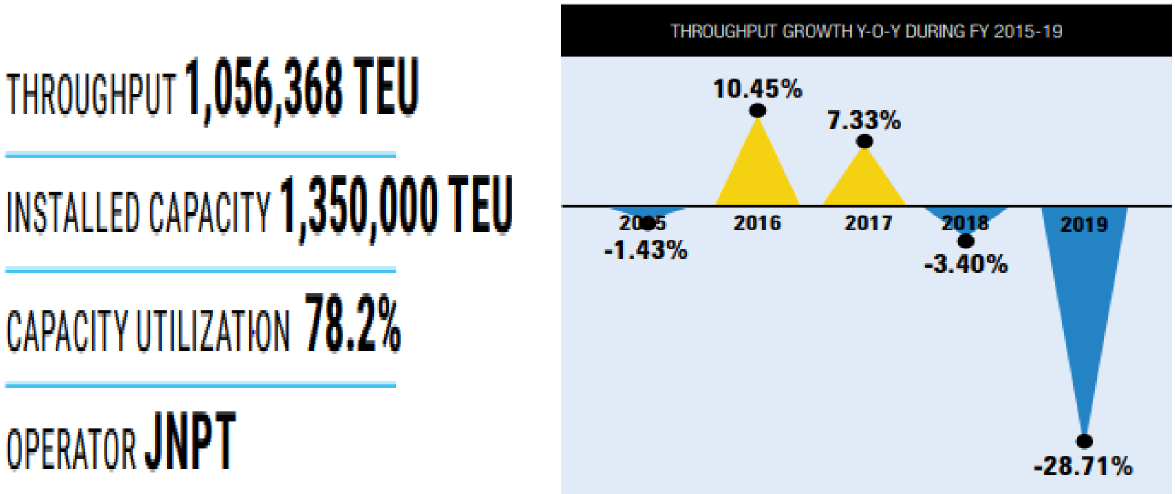
JAWAHARLAL NEHRU PORT CONTAINER TERMINAL

Despite being India's largest significant port by volume, with a throughput of 5 million TEUs, JNPT Port-owned and managed container terminal Jawaharlal Nehru Port Container Terminal (JNCPT) has had negative growth in the previous two fiscal years. The terminal's expansion is being hampered by a lack of digitization at gate admission procedures and low quay crane productivity. Other important problems associated with the terminal's negative growth include higher lead times for import out-gate owing to Equipment Interchange Receipt (EIR) creation at the gate.

Because of the greater processing time required for CISF seal number verification, its gate usage is substantially lower than that of its contemporaries. Its yard storage usage is now the lowest of all. However, JNPCT has already begun working on improving these areas in order to make operations more efficient.

For fiscal year 2018-19, the terminal handled 1,056,368 TEUs, with a current handling capacity of 1,350,000 TEUs per year. The terminal's capacity utilisation is 78 percent, indicating a need for growth in the near future. The overall traffic handled in March 2019 is 70,965 TEUs, which is roughly -36 percent less than the amount handled in the same month the previous year.

The cumulative annual growth rate (CAGR) for the previous five years, from FY 2014-15 to FY 2018-19, is -4.3 percent. JNPCT now has 11 truck gates, five for exports, four for imports, and two for empty mobility. JNPCT has modified its gate entrance processes to make it easier for trailers and vehicles entering the port. The terminal used a more modern electronic, radio frequency identification technology (RFID) gate working process. This will increase gate productivity. The terminal's primary areas of development include dual cycling, effective yard layout, twin lift quay cranes, quay crane operator skills, and productivity improvements through monetary incentives.



4.5 Performance of JAWAHARLAL NEHRU PORT CONTAINER TERMINAL

ADANI MUNDRA CONTAINER TERMINAL

Adani Ports and SEZ Ltd owns and operates the Adani Mundra Container Terminal (AMCT). The terminal was built with cutting-edge technology and provides outstanding services that meet worldwide standards. AMCT saw throughput of 1.05 million TEUs in FY 2019-20, a 14 percent increase over the previous year tonnage. Berth Productivity and Gross Crane Rate are up 14 percent and 12 percent, respectively, in FY 2019-20 compared to FY 2018-19, with 544 vessels handled in FY 2018-19, up 14 percent from FY 209-20.

The port also has a good capacity utilisation rate of 88 percent, indicating that there is enough installed capacity for trading. In FY 2019-20, this facility handled 0.05 million TEUs of transhipment as part of its total volume handled. AMCT has two in-line berths, a total quay length of 631 metres, and an alongside draught of 15.5 metres. It can also accommodate double stack container trains, allowing for speedier container evacuation to northern and western India. AMCT is the country's actual leader in port automation, as it has Electrical RTG that can be controlled remotely.

The operators work in a safe and ergonomic office setting and can operate many cranes at the same time. AMCT has a number of additional advancements to its name, such as automated gate operations. This terminal set a record by processing 5738 TEUs in under 29 hours during the M.V.EVER CONQUEST's port visit in May 2019.

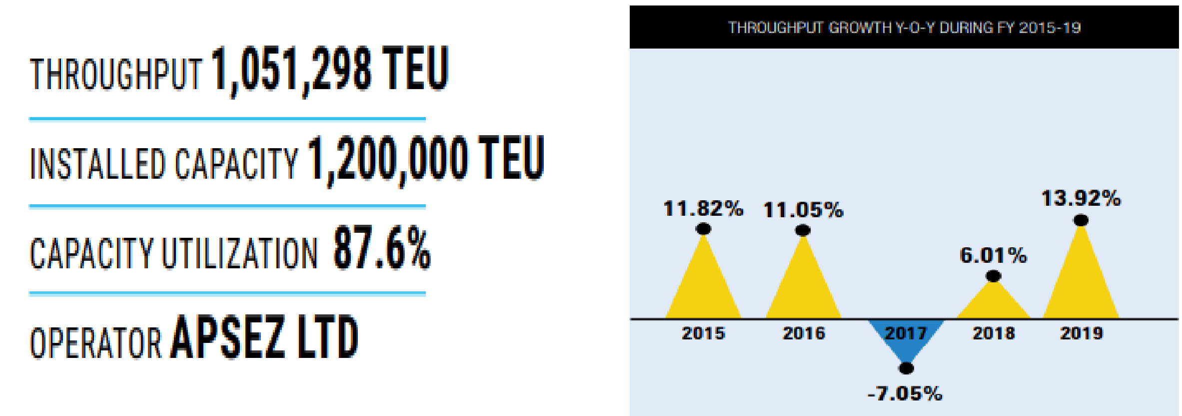


Fig 4.6 Performance of ADANI MUNDRA CONTAINER TERMINAL

CHENNAI INTERNATIONAL TERMINALS PVT LTD

Chennai International Terminals Pvt Ltd (CITPL) is a subsidiary of PSA International (PSA), one of the world's largest port corporations. This terminal handled 0.96 million TEUs in FY 2018-19, exceeding the previous year's tonnage of 0.87 million TEUs while increasing by 9.66 percent year on year. Import volume of 0.55 million TEUs increased by 7.4 percent in FY 2019-20 compared to 0.51 million TEUs the previous year. Export volume is 0.39 million TEUs, representing a 9.8 percent increase over the previous year's volume of 0.36 million TEUs.

The facility handled 10,773 TEUs in coastal volume. It is one of the most productive terminals on India's east coast, with a market share of 21%. The port had an average turnaround time of 2.01 days, a 13.93 percent increase, average production per ship berth day of 2566.32 TEUs, a 6.77 percent increase, and average crane productivity of 28.59 movements per hour, a 4.23 percent increase. CITPL has improved the standard for terminal productivity in South and East India once more. A vessel pace of 171 movements per hour directly translates into cost savings for shipping lines and port users.

This accomplishment broke CITPL's previous South and East India record of 168 movements per hour, which was also accomplished in August 2019. On September 12, 2020, the terminal processed 3,023 transfers in little under 19 hours for the 4,252 TEU (Twenty-foot Equivalent Unit) vessel "Wan Hai 507." PSA's Chennai International Terminals Pvt Ltd ("CITPL") and Container Corporation of India ("CONCOR") have relaunched shuttle trains between CITPL and Concor's Tondiarpet Inland Container Depot ("TNPM"), with a full rake of 80 twenty-foot equivalent units ("TEU") departing from CITPL to TNPM over a 7-kilometer distance on October 15, 2018. (operational from 1st May 2018). CITPL and CONCOR improved Last Mile Connectivity by reopening a 7-kilometer rail bridge between CITPL and ICD Tondiarpet. CITPL can handle two rakes at the same time and provides frequent train services to and from ICD Whitefield.

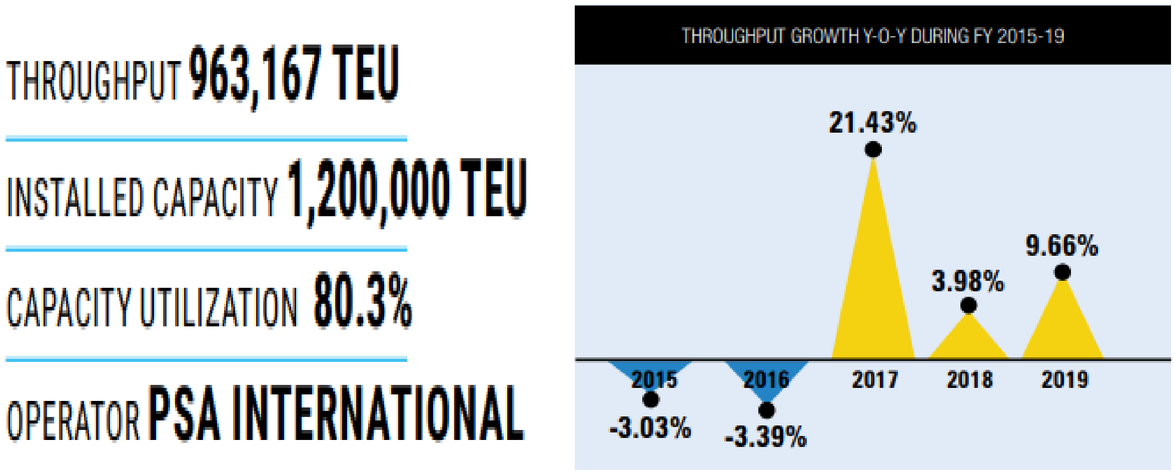


Fig 4.7 performance of CHENNAI INTERNATIONAL TERMINALS PVT LTD

NHAVA SHEVA INDIA GATEWAY TERMINAL

The Nhava Sheva (India) Gateway Terminal (NSIGT) is one of two terminal concessions held by DP World in India's busiest container harbour, Jawaharlal Nehru Port Trust (JNPT). This terminal is regarded by DP World as a future investment and trade facilitator in India's rising market economy. This terminal handled 4,568 moves, or 6,017 TEUs, with an outstanding Gross Crane Rate of 34.5 movements per hour. As this terminal adds a fresh feather to DP World's portfolio of terminals in India, with exponential growth year over year.

The Terminal is outfitted with the largest and most modern remote-controlled quay cranes, automated gates driven by Optical Character Recognition (OCR) technology, an innovative Reefer Monitoring System, and ground-breaking Electrical Rubber-Tyred Gantry cranes (E-RTGs). For the fiscal year 2019-20, the port had a throughput of 9.38 lakh TEUs, a 44 percent increase over the previous year. For the current fiscal year, the average gross crane productivity is 31.3 movements per hour. NSIGT is the first company in India to employ "Remote Quay Cranes Operations Capability." A 24x7 RFR monitoring system with no human interaction is implemented, increasing the efficiency of temperature recording and eliminating mistakes. At NSIGT, automated gates using OCR technology provide uninterrupted gate transactions.

OCR and RFID technologies have shortened gate turnaround times, reduced mistakes, and improved data accuracy at container gates. At NSIGT, an innovative Video Wall with integrated technologies and communications features for real-time governance, operations monitoring, and outstanding management has been implemented to achieve efficiency from a single place within the Operations Centre. It also contains a system that enables continuous two-way communications to allow real-time visibility of all operations. In terms of volume, NSIGT has surpassed NSICT in three years. DP World is shifting its operations to NSICT because the terminal is more commercially advantageous.

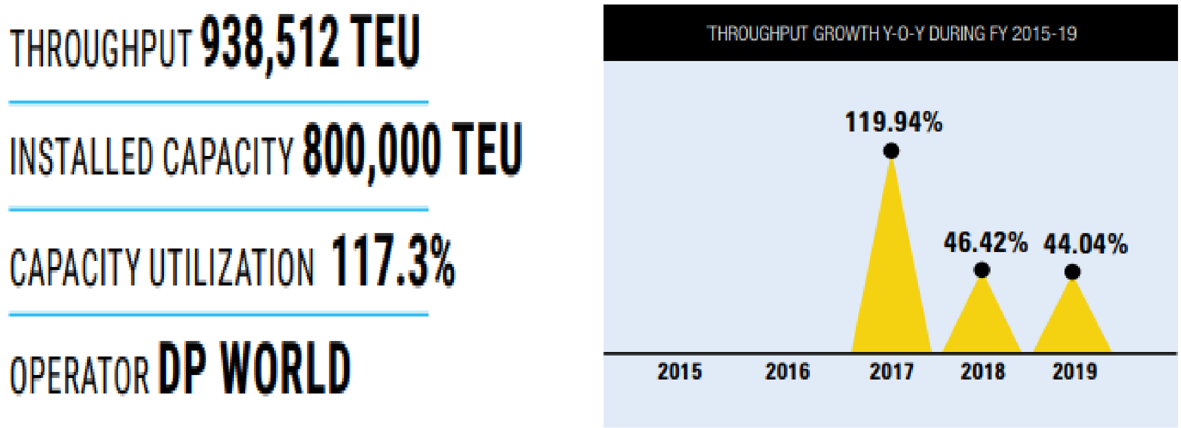


Fig 4.8 Performance of NHAVA SHEVA INDIA GATEWAY TERMINAL

APM TERMINALS PIPAVAV

APM Terminals Pipavav (APMT Pipavav) is part of APM Terminals' worldwide terminal network and has a capacity of 1.35 million TEUs. Container traffic grew by 29% in FY 2019-20 due to new service expansions and a strong mix of EXIM, Transshipment, and Coastal volumes. The compounded annual growth rate of container volume over the previous five years, from FY 2015 to 2020, is 5.6%.

The firm also increased its consolidated income during the April-June quarter of FY 2019-20 to Rs 189.9 crore, up from Rs 186.6 crore in the same time last year. APMT Pipavav has simplified shift changes, which is a significant improvement in efficiency. Shift transitions are completed 15- 20 minutes quicker. This method decreased vessel idle periods and the effect on cranes per hour by around 16%. Clearly defined parking bays ensure that terminal trailers are placed at an angle and in a line, resulting in a shorter exit time for vehicles. The port has also implemented a parking method for RTGs, which has increased efficiency.

At the end of the yard block, a parking method for Rubber Tyre Gantry cranes (RTGs) was also implemented. This has minimised pedestrian dangers for RTGs while operators change shifts. The installation of a parking mechanism for Rubber Tyre Gantry cranes (RTGs) has minimised pedestrian dangers. CONCOR created a new rail connection called POLYMER express from ICD Kanpur (JRY) to Port Pipavav to allow exporters and importers transfer their cargo more quickly. CMA CGM has begun a weekly scheduled block train with a capacity of

180 TEUs from port Pipavav to Garhi Harsaru (NCR Region). This will aid the commerce in optimising its supply chain.

Digitization is a new trend that terminals are adopting in order to reduce time and enhance efficiency. Pipavav terminal's most recent digital solution is e-form 13, an online version of Form-13 (gate-in permits issued by terminals). This saves paper as well as time.

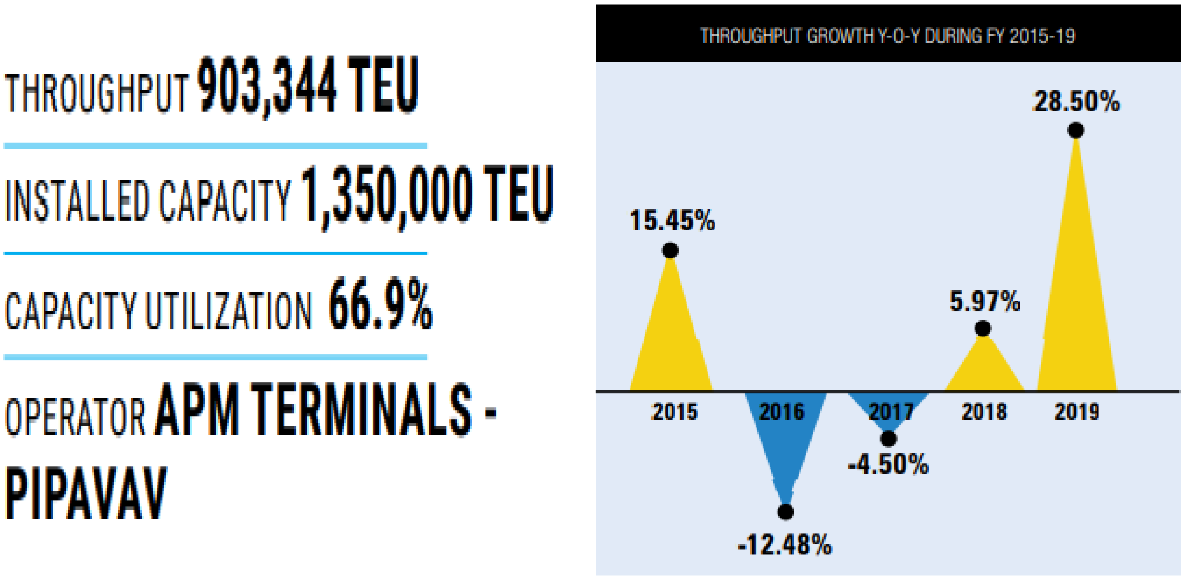


Fig 4.9 Performance of APM TERMINALS PIPAVAV

MUNDRA INTERNATIONAL CONTAINER TERMINAL

Mundra International Container Terminal (MICT) is a DP World terminal located at Gujarat's largest private port, Adani Mundra port. Three Adani-owned and partnered container terminals surround this facility. The terminal saw negative growth of 22.7 percent in fiscal year 2019-20, with a handled volume of around 0.835 million TEUs. The compounded annual growth rate (CAGR) from fiscal year 2014-15 to fiscal year 2019-20 is -3.6%. MICT has handled almost 11 million TEUs since it began operations in 2003.

The terminal has consistently invested in infrastructure and technology in order to deliver faster and more cost-effective transactions. MICT installed a remotely operated rail-mounted gantry crane as well as electric rubber-tired gantry cranes. This terminal has a 2,073-foot berth length, a 48-foot draught, a 59-acre storage yard, and dedicated rail-road connectivity. MICT has set a new record for maximum berth productivity, with about 179.38 shipshore movements, or 1.29 times the average berth productivity. It has ranked in the top quarter of the world's best performing container terminals, with an average gross crane rate (GCR) of roughly 34.3 movements per hour.

The facility also had the highest berth productivity, with around 208 shipshore transfers for another vessel deployed in service to East Africa. This terminal's focus is on increasing productivity by continually updating terminal infrastructure and IT systems in order to give our customers with faster and more cost-effective trading solutions. The terminal's focus remains on supporting a dependable and timely flow of cargo, allowing its clients' products to reach the market faster, lowering logistics costs, and improving the efficacy of the supply chain in North Western India.

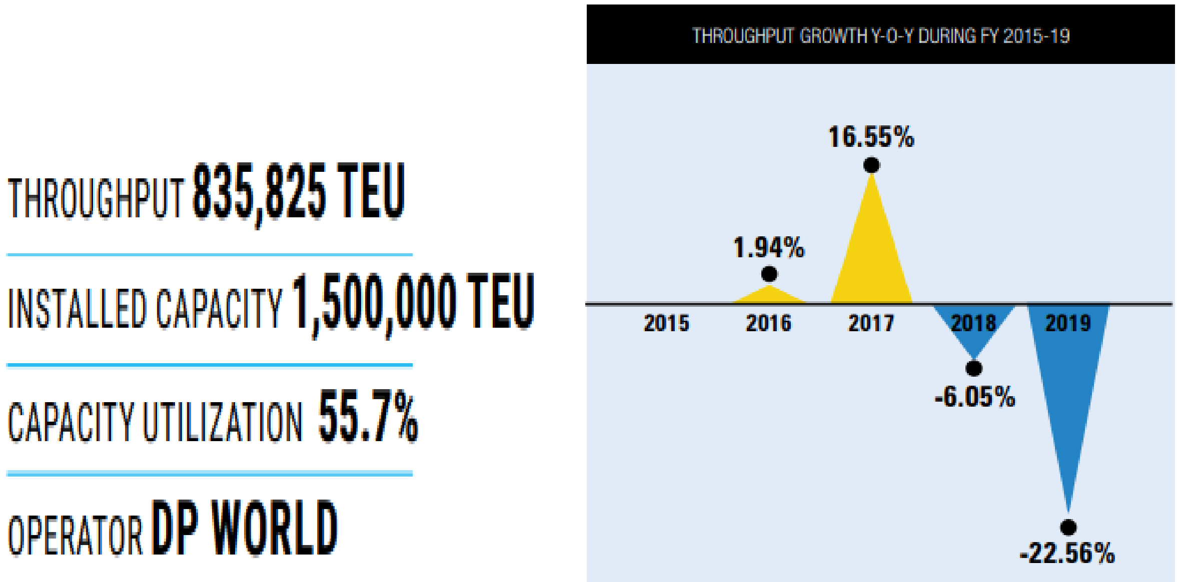


Fig 4.10 Performance of MUNDRA INTERNATIONAL CONTAINER TERMINAL

<u>ADANI CMA MUNDRA TERMINAL</u>

Declared a Pedestrian Free terminal, the first of its type in the country, this cutting-edge and technologically advanced container port provides premium service quality to its clients. This terminal is a collaboration between APSEZ, India's largest port operator, and CMA-Terminal, the world's fourth largest maritime corporation. The container terminal, which has a total installed capacity of 8,00,000 TEUs (with 4 QCs, 12 RTGs, 3 Reach stackers, and 1 Empty Container Handler), added further 4,00,000 TEUs (2 QCs and 5 RTGs) capacity in the previous fiscal year.

For the fiscal year 2018-19, the terminal handled 740,786 TEUs, representing a 42 percent increase over the previous year. The overall size of the yard is 27.27 hectares. The terminal is a true leader in overall operational excellence, with a capacity utilisation rate of approximately 61.7 percent, a 13 percent increase in average turnaround time (YOY), a 30 percent increase in average output per ship berth day, and a significant increase in average crane movements per hour.

Its committed, highly skilled, and motivated workforce has regularly delivered a gross crane rate of 30+ movements per hour and a truck turn around time of less than 30 minutes. Its new, cutting-edge QCs have cutting-edge technology with a 65-meter outreach, an 18-meter back reach, a lift height of 50 metres, and a span of 35 metres. It uses a laser-guided anti-collision system from crane to crane and crane to ship. At the terminal, cameras with recording capabilities are installed for effective operation monitoring. A fire suppression system is an extra bonus. For safety, each crane features a separate man cage and an over-height frame. These cranes have the capability of handling the world's biggest containerships at the moment.

During the fiscal year, the terminal operator also adopted significant technical upgrades and creative procedures. One such endeavour is an e-survey at the entrance in conjunction with the Pole Seal Cam.

Surveyors are equipped with a pole seal cam, which allows them to read the seal number from a safe distance away from traffic. The terminal also used an electronic seal cutter to remove seals off empty containers for their assessment, which saved a significant amount of time. The organisation is also developing a new Terminal Operating System and conducting pilot tests on a few novel concepts and cutting-edge technology. The terminal serves as a gateway to Europe, the Middle East, the United States, Africa, and South Asia, as well as all of the Indian subcontinent's coastline ports

THROUGHPUT **740,786 TEU**

INSTALLED CAPACITY **1,200,000 TEU**

CAPACITY UTILIZATION **61.7%**

OPERATOR **AP SEZ LTD & CMA CGM SA**

.

Fig 4.11 Performance of ADANI CMA MUNDRA TERMINAL

CHENNAI CONTAINER TERMINAL

The Chennai Container Terminal (CCT) is a cutting-edge terminal managed by DP World to meet rising local demand for commercial products. With a recent request from CMA CGM, the facility can dock boats of up to 9,000 TEUs. CCT serves the city's and its hinterland's export and import needs by serving China, West Africa, Europe, and the United States. This terminal also includes a container freight station with a covered area of 6,500 square metres, which allows cargo to be transshipped to inland destinations such as Bangalore, Hyderabad, Cochin, Pondicherry, and the surrounding region.

Meanwhile, its container rail service (CRRS) extends beyond the terminal gate and into our clients' supply chains throughout India's enormous hinterland. CCT must enhance yard equipment to balance dockside and yard activities and maintain a smooth flow of containers. There is also a requirement for more yard area for CCT. CCTPL handled 0.65 million TEUs in FY 2018-19, a 1% increase over the previous year's throughput of 0.64 million TEUs.

The facility handled 381 boats and transshipped 452 TEUs, with an import volume of 3,56,370 TEUs and an export volume of 2,92,035 TEUs. The terminal's capacity utilisation is 54.4 percent. CCTPL handled a total of 2,73,747 TEUs in the current fiscal year 2019-20, with imports totaling 1,45,238 TEUs and exports totaling 1,28,509 TEUs. CCT, a global trade enabler run by DP World, has set another milestone by securely berthing the MV CMA CGM RHONE, the biggest container vessel to visit India's south and eastern coasts and call in Chennai Port. Another Malta container vessel with a length of 299.95m and a capacity of 9,365 TEU is also parked at this facility.

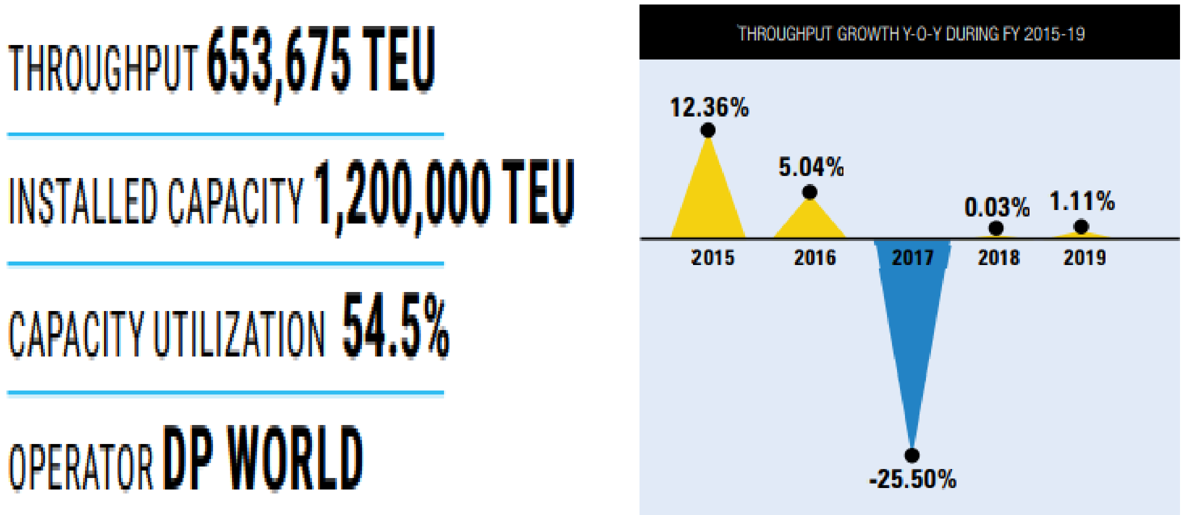


Fig 4.12 Performance of CHENNAI CONTAINER TERMINAL

4.5 Vertical integration between shipping companies, terminal operators and inland logistics intensifies

Container shipping firms aimed to extend their service offerings to encompass shipping, terminal operations, and inland logistics from 2010 to 2020 in order to limit vulnerability to variable freight prices and establish other income streams by delivering end-to-end logistic solutions. Identifies the 21 largest worldwide players, who control 80% of global terminal operations. APM Terminals/Maersk; Terminal Investment Limited/Mediterranean Shipping Company; Mitsui Osaka Shosen Kaisha Lines; Yang Ming Marine Transport Corporation; HMM and COSCO are just a few of these firms. Similarly, port operators are vertically integrating by gaining greater control over inland logistics in order to deliver integrated service offerings and earn more value.

In 2020, for example, Maersk acquired a customs brokerage firm and a warehousing and distribution services provider (JOC.com, 2020c), CMA CGM partnered with an online platform that connects couriers to online retailers (Lloyd's List, 2019b), and DP World acquired a global feeder network as well as freight forwarding services providers (The Loadstar, 2020b). According to a recent study of a representative group of ports in Latin American and Caribbean countries (Argentina, the Bahamas, Brazil, Colombia, Jamaica, Mexico, Panama, and Peru), a significant portion of container volumes in the region (see table 2.12) is handled at port terminals controlled by shipping companies that are members of the three major alliances (2M, Ocean Alliance, and THE Alliance) (Sánchez, forthcoming).

Terminal investments made by shipping companies can have a favourable influence on port growth. These expenditures, for example, can enable more capital investment to be secured to update port infrastructure to serve ever-larger boats, boost efficiency and service dependability, and cut costs and operating times (Zhu et al., 2019). However, growing vertical integration of shipping and port services may discourage rival lines from calling at ports, limit shippers' options, and affect approaches to terminal concessions (UNCTAD, 2018).

Fig 4.13 Top 21 Global Terminal Operators, throughput and Capacity ,2020 (Million 20-Foot Equivalent Units)

Ranking	Operator	Throughput				Capacity	
		Total port handling (million TEUs)	Share of world throughput (percentage)	Growth or decline (million TEUs)	Growth or decline (percentage)	Total capacity (million TEUs)	Growth or decline (percentage)
1	COSCO	109.8	13.7	4.0	3.8	141.6	8.9
2	PSA International	84.8	10.6	4.8	5.9	117.0	3.9
3	APM Terminals	84.2	10.5	5.5	7.0	107.6	7.9
4	Hutchison Ports	82.6	10.3	0.1	0.1	113.0	0.9
5	DP World	69.4	8.7	-0.6	-0.9	91.0	1.5
6	Terminal Investment Limited	50.8	6.3	3.1	6.4	72.8	16.8
7	China Merchants Ports	35.6	4.4	1.1	3.1	44.2	3.1
8	CMA CGM	26.1	3.3	0.5	2.0	43.1	12.3
9	SSA Marine	13.0	1.6	0.4	3.3	20.5	1.4
10	ICTSI	11.8	1.5	2.0	20.9	20.0	11.7
11	Eurogate	11.7	1.5	-1.9	-14.2	20.6	-9.1
12	Evergreen	10.1	1.3	-0.3	-3.0	17.0	-0.9
13	Hyundai	9.5	1.2	2.0	25.8	12.1	-2.1
14	NYK Lines (Nippon Yusen Kabushiki Kaisha)	8.2	1.0	-2.4	-22.4	22.5	-5.3
15	MOL (Mitsui Osaka Shosen Kaisha Lines)	7.8	1.0	0.5	6.7	10.7	6.6
16	HHLA ((Hamburger Hafen und Logistik)	7.7	1.0	0.2	3.2	10.5	1.5
17	Yildirim/Yilport	6.1	0.8	-0.3	-4.4	11.9	16.8
18	Bollore	6.0	0.7	0.7	12.7	9.8	4.5
19	Yang Ming Marine Transport Corporation	4.3	0.5	0.0	-1.1	8.4	0.0
20	SAAM Puertos (Sudamericana Agencia Aéreas y Maritimas)	3.1	0.4	0.0	-0.3	5.6	8.2
21	"K" Line (Kawasaki Kisen Kaisha)	3.1	0.4	-0.2	-4.6	5.7	0.0
	Global operators total	**645.8**		**19.1**	**3.1**	**905.6**	**5.2**

Chapter-5

5.1 Conclusion:

India is fast intensifying its attempts to build a plethora of bilateral and regional trade agreements in order to engage with the global economy. It is believed that as a result of these agreements, Indian enterprises would be able to enter the market more rapidly and cost-effectively than their counterparts in other nations. However, in order to make this a reality, ports must improve their infrastructure, reduce the cycle time of processing containers, and have efficient gate operations. Container DC has been highlighted as one of the techniques for reducing cycle time and making optimal use of available infrastructure.

Pressure on the berthing window, yard equipment, quay equipment, IT capability, storage facility, layout, skilled workforce, terminal land size, maritime accessibility, operational flexibility, logistics integration, management support, and integration with other ports were among the numerous factors identified. The most influential obstacle was identified using interpretative structural modelling (ISM). The key implementation constraints were identified as IT capabilities and integration with other ports. These insights may help to explain the forces that influence the various implementation difficulties.

5.2 Suggestions:

The findings of this investigation give important insights into the fundamental obstacles for modernising port systems in order to enhance operational efficiency and convenience of doing business.

Aside from infrastructure, enhancing operational logistics efficiency would need a number of technology and procedural innovations.

1. Create digital platforms to reduce the number of physical contact points. Conduct rigorous audits to track the occurrence of manual operations and physical contact points such as berth allocation, customs permission for domestic coastal goods, and the transshipment procedure, and establish digital platforms to progressively phase these processes away.

2. Implement current PCS messages and create new ones. The PCS includes all of India's main ports (13) as well as crucial smaller ports (5). 8 The present version of the PCS has 7 modules and 114 messages for information sharing. However, with the exception of six to eight PCS messages, the remainder are not in use owing to a lack of interface with current systems. To reach a better degree of integration among stakeholders, it is critical to not only adopt current PCS messages but also to design new ones. For example, if light dues receipts10 from the Portal of the Directorate General of Lighthouses and Lightships could be moved to PCS via a new PCS message, all stakeholders may view and validate it, avoiding the requirement for a new PCS message.

3. Set up dependable systems with improved user interfaces. The PCS's efficient operation and expertise in delivering timely approvals are heavily reliant on the dependability of individual systems and their user interface. Stakeholders, for example, complain that ICEGATE is sluggish, frequently fails, and wastes maintenance downtime. This causes delays in the submission of the bill of entry, shipping bill, IGM, export general manifest (EGM), and other supporting paperwork. Increasing the speed of the ICEGATE system and improving maintenance to avoid malfunctions would make it simpler for the CHA to use the system and eliminate delays in submitting cargo-related papers. Similarly, improved user interface will allow PGAs to view all papers submitted by the CHA to e-Sanchit (through the Single Window Interface for Facilitating Trade, or SWIFT), preventing numerous uploads of the same document.

4. Processes should be streamlined and simplified. Last but not least, in order to eliminate redundancies, it is critical to work on simplifying and streamlining operations across ports. This may entail legislative and regulatory reforms, as well as the development of standard operating procedures (SOPs) to improve efficiency. At the moment, for example, the CFS obtains hard copy cargo-related papers from the CHA or importer or exporter and retains them for up to 5 years on behalf of customs, which requires them for clearance audit. As a result, numerous submissions and physical touch points for cargo approval are required. Customs should instead audit papers using the Indian Customs Electronic Data Interchange System.

Aside from these general recommendations, specific action points unique to each port may be identified through a thorough transaction-level audit of processes by the port administration, as well as an associated scoring mechanism to serve as a comparative benchmark and encourage them to pursue self-improvement.

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Annexure

PORT	UNIT	2001-2002			2000-2001		
		IMPORT	EXPORT	TOTAL	IMPORT	EXPORT	TOTAL
CALCUTTA	TONNAGE TEUs	899 (62)	511 (36)	1410 (98)	1194 (82)	817 (56)	2011 (138)
HADIA	TONNAGE TEUs	549 (37)	973 (56)	1522 (93)	148 (12)	658 (39)	806 (51)
PARADIP	TONNAGE TEUs	3 -	4 -	7 -	--	7 -	7 -
VISAKHAPATNAM	TONNAGE TEUs	143 (12)	177 (10)	320 (22)	110 (10)	168 (10)	278 (20)
CHENNAI	TONNAGE TEUs	3100 (182)	2757 (162)	5857 (344)	2956 (183)	2813 (169)	5769 (352)
TUTICORIN	TONNAGE TEUs	919 (104)	1280 (110)	2199 (214)	629 (79)	941 (78)	1570 (157)
COCHIN	TONNAGE TEUs	682 (72)	1217 (80)	1899 (152)	753 (68)	1037 (75)	1790 (143)
NEW MANGALORE	TONNAGE TEUs	7 (2)	30 (2)	37 (4)	4 (1)	16 (1)	20 (2)
MORMUGAO	TONNAGE TEUs	21 (2)	37 (2)	58 (4)	19 (2)	25 (2)	44 (4)
MUMBAI	TONNAGE TEUs	2496 (168)	1188 (86)	3684 (254)	2597 (191)	1766 (130)	4363 (321)
JNPT	TONNAGE TEUs	8531 (751)	9953 (822)	18484 (1,573)	6730 (561)	7547 (629)	14277 (1,190)
KANDLA	TONNAGE TEUs	588 (65)	1164 (61)	1752 (126)	481 (47)	806 (45)	1287 (92)
TOTAL	**TONNAGE TEUs**	**17938 (1,457)**	**19291 (1,427)**	**37229 (2,884)**	**15621 (1,236)**	**16601 (1,234)**	**32222 (2,470)**

PORT	UNIT	2003-2004			2002-2003		
		IMPORT	EXPORT	TOTAL	IMPORT	EXPORT	TOTAL
CALCUTTA	TONNAGE TEUs	1110 (78)	636 (45)	1746 (123)	924 (66)	574 (40)	1498 (106)
HADIA	TONNAGE TEUs	839 (54)	1436 (83)	2275 (137)	651 (45)	1199 (72)	1850 (117)
PARADIP	TONNAGE TEUs	3 (2)	57 (2)	60 (4)	8 (1)	25 (1)	33 (2)
VISAKHAPATNAM	TONNAGE TEUs	80 (10)	197 (10)	277 (20)	105 (10)	191 (12)	296 (22)
CHENNAI	TONNAGE TEUs	4522 (282)	4106 (257)	8628 (539)	3682 (217)	3536 (208)	7218 (425)
TUTICORIN	TONNAGE TEUs	1101 (126)	1586 (128)	2687 (254)	926 (104)	1375 (109)	2301 (213)
COCHIN	TONNAGE TEUs	1062 (85)	1063 (85)	2125 (170)	996 (80)	1074 (86)	2070 (166)
NEW MANGALORE	TONNAGE TEUs	35 (3)	61 (4)	96 (7)	26 (3)	58 (3)	84 (6)
MORMUGAO	TONNAGE TEUs	41 (5)	62 (5)	103 (10)	29 (5)	61 (4)	90 (9)
MUMBAI	TONNAGE TEUs	2104 (153)	712 (44)	2816 (197)	2332 (163)	811 (50)	3143 (213)
JNPT	TONNAGE TEUs	12169 (1,087)	15616 (1,182)	27785 (2,269)	9582 (910)	13282 (1,020)	22864 (1,930)
KANDLA	TONNAGE TEUs	800 (89)	1604 (81)	2404 (170)	688 (80)	1537 (77)	2225 (157)
TOTAL	**TONNAGE TEUs**	**23866 (1,974)**	**27136 (1,926)**	**51002 (3,900)**	**19949 (1,684)**	**23723 (1,682)**	**43672 (3,366)**

PORT	UNIT	2005-2006			2004-2005		
		IMPORT	EXPORT	TOTAL	IMPORT	EXPORT	TOTAL
KOLKATA	TONNAGE TEUs	1918 (110)	1316 (93)	3234 (203)	1287 (89)	1070 (70)	2357 (159)
HADIA	TONNAGE TEUs	773 (51)	938 (59)	1711 (110)	809 (53)	1220 (75)	2029 (128)
PARADIP	TONNAGE TEUs	1 (2)	44 (1)	45 (3)	- (-)	31 (2)	31 (2)
VISAKHAPATNAM	TONNAGE TEUs	266 (23)	364 (24)	630 (47)	265 (23)	370 (22)	635 (45)
CHENNAI	TONNAGE TEUs	6092 (381)	5664 (354)	11756 (735)	5146 (322)	4718 (295)	9864 (617)
TUTICORIN	TONNAGE TEUs	1393 (156)	2035 (165)	3428 (321)	1244 (148)	1961 (159)	3205 (307)
COCHIN	TONNAGE TEUs	1245 (100)	1294 (103)	2539 (203)	1152 (92)	1063 (85)	2315 (185)
NEW MANGALORE	TONNAGE TEUs	68 (5)	81 (5)	149 (10)	65 (5)	71 (4)	136 (9)
MORMUGAO	TONNAGE TEUs	53 (5)	52 (4)	105 (9)	56 (5)	61 (5)	117 (10)
MUMBAI	TONNAGE TEUs	1494 (113)	605 (43)	1957 (159)	2003 (159)	568 (60)	2571 (219)
JNPT	TONNAGE TEUs	15482 (1,541)	16338 (1,258)	33777 (2,667)	13349 (1,158)	15398 (1,213)	28747 (2,371)
KANDLA	TONNAGE TEUs	972 (80)	1339 (68)	2311 (148)	1277 (101)	1477 (80)	2754 (181)
TOTAL	**TONNAGE TEUs**	**29757(2,567)**	**29970 (2,177)**	**59727(4,744)**	**26653 (1,155)**	**28108 (2,078**	**54761(4,233)**

PORT	UNIT	2009-2010			2008-2009		
		UNLOAD	LOAD	TOTAL	UNLOAD	LOAD	TOTAL
KOLKATA	TONNAGE TEUs	4112 (195)	2534 (183)	6646 (378)	3176 (157)	2307 (145)	5483 (302)
HADIA	TONNAGE TEUs	1076 (62)	934 (62)	2010 (124)	1054 (57)	1319 (70)	2373 (127)
PARADIP	TONNAGE TEUs	- (2)	44 (2)	44 (4)	- (1)	31 (1)	31 (2)
VISAKHAPATNAM	TONNAGE TEUs	794 (49)	884 (49)	1678 (98)	624 (41)	738 (45)	1362 (86)
CHENNAI	TONNAGE TEUs	12067 (625)	11410 (591)	23477 (1216)	10617 (590)	9964 (553)	20581 (1143)
TUTICORIN	TONNAGE TEUs	3203 (214)	3396 (226)	6599 (440)	2675 (214)	2807 (225)	5482 (439)
COCHIN	TONNAGE TEUs	1970 (145)	1958 (145)	3928 (290)	2139 (131)	1382 (130)	3521 (261)
NEW MANGALORE	TONNAGE TEUs	234 (16)	241 (15)	475 (31)	218 (15)	186 (14)	404 (29)
MORMUGAO	TONNAGE TEUs	117 (9)	75 (8)	192 (17)	75 (7)	72 (7)	147 (14)
MUMBAI	TONNAGE TEUs	549 (48)	57 (10)	606 (58)	571 (53)	720 (39)	1291 (92)
JNPT	TONNAGE TEUs	28487 (2,049)	24608 (2,013)	53095 (4,062)	24671 (2,019)	25931 (1,933)	50602 (3,952)
KANDLA	TONNAGE TEUs	997 (79)	1439 (68)	2436 (147)	910 (79)	1233 (59)	2143 (138)
TOTAL	**TONNAGE TEUs**	**53606 (3,493)**	**47580 (3,372)**	**101186 (6,865)**	**46730 (3,364)**	**46659 (3,221)**	**93389 (6,585)**

PORT	UNIT	2011-2012			2010-2011		
		UNLOAD	LOAD	TOTAL	UNLOAD	LOAD	TOTAL
KOLKATA	TONNAGE TEUs	3563 (209)	3255 (203)	6818 (412)	3421 (192)	2799 (185)	6220 (377)
HADIA	TONNAGE TEUs	1340 (67)	1279 (73)	2619 (140)	1323 (71)	1512 (78)	2835 (149)
PARADIP	TONNAGE TEUs	10 (4)	99 (4)	109 (8)	- (1)	61 (3)	61 (4)
VISAKHAPATNAM	TONNAGE TEUs	2168 (120)	2046 (114)	4214 (234)	1242 (73)	1330 (72)	2572 (145)
CHENNAI	TONNAGE TEUs	15540 (805)	14536 (753)	30076 (1558)	15041 (779)	14381 (745)	29422 (1524)
TUTICORIN	TONNAGE TEUs	3098 (231)	6129 (246)	9227 (477)	3238 (226)	4931 (242)	8169 (468)
COCHIN	TONNAGE TEUs	2728 (164)	1855 (172)	4583 (336)	2631 (147)	1668 (143)	4299 (290)
NEW MANGALORE	TONNAGE TEUs	289 (23)	356 (22)	645 (45)	224 (20)	344 (20)	568 (40)
MORMUGAO	TONNAGE TEUs	144 (11)	87 (11)	231 (22)	105 (10)	77 (8)	182 (18)
MUMBAI	TONNAGE TEUs	498 (51)	53 (7)	551 (58)	566 (61)	87 (11)	653 (72)
JNPT	TONNAGE TEUs	29740 (2,205)	28493 (2,116)	53095 (4,321)	29458 (2,149)	26968 (2,121)	56426 (4,270)
KANDLA	TONNAGE TEUs	978 (92)	1813 (76)	2791 (168)	991 (87)	1595 (73)	2586 (160)
TOTAL	**TONNAGE TEUs**	**60096 (3,982)**	**600001 (3,797)**	**120097 (7,779)**	**58240 (3,816)**	**55753 (3,701)**	**113993 (7,517)**

Port	Unit	2014-2015			2015-2016			2016-2017		
		Unloaded	Loaded	Total	Unloaded	Loaded	Total	Unloaded	Loaded	Total
KOLKATA	Tonnage TEUs	4454 (269)	3656 (259)	8110 (528)	4941 (298)	4322 (280)	9263 (578)	5391 (328)	4496 (308)	9887 (636)
HALDIA	Tonnage TEUs	1017 (51)	941 (51)	1958 (102)	775 (43)	601 (42)	1376 (85)	1233 (59)	1234 (77)	2467 (136)
PARADIP	Tonnage TEUs	15 (2)	52 (2)	67 (4)	65 (2)	56 (3)	121 (5)	12 (1)	25 (1)	37 (2)
VISAKHAPATNAM	Tonnage TEUs	2096 (124)	2277 (124)	4373 (248)	2367 (146)	2778 (147)	5145 (293)	2761 (181)	3667 (186)	6428 (367)
KAMARAJAR(ENNORE)	Tonnage TEUs	- -	- -	- -	1 -	- -	1 -	1 -	- -	1 -
CHENNAI	Tonnage TEUs	15591 (808)	14354 (744)	29945 (1,552)	16100 (834)	14107 (731)	30207 (1,565)	16203 (840)	12647 (655)	28850 (1,495)
V.O. CHIDAMBARANAR	Tonnage TEUs	4389 (289)	6645 (271)	11034 (560)	5178 (310)	7210 (302)	12388 (612)	5157 (323)	7834 (319)	12991 (642)
COCHIN	Tonnage TEUs	3459 (187)	1787 (179)	5246 (366)	3917 (214)	1868 (205)	5785 (419)	4581 (244)	2259 (247)	6840 (491)
NEW MANGALORE	Tonnage TEUs	498 (32)	423 (31)	921 (63)	645 (38)	460 (38)	1105 (76)	832 (48)	579 (47)	1411 (95)
MORMUGAO	Tonnage TEUs	140 (13)	172 (12)	312 (25)	209 (14)	136 (12)	345 (26)	234 (15)	168 (15)	402 (30)
MUMBAI	Tonnage TEUs	534 (41)	10 (4)	544 (45)	445 (38)	92 (5)	537 (43)	448 (37)	110 (5)	558 (42)
J.N.P.T.	Tonnage TEUs	30137 (2,287)	26796 (2,180)	56933 (4,467)	30482 (2,297)	26308 (2,195)	56790 (4,492)	29547 (2,273)	24983 (2,227)	54530 (4,500)
KANDLA	Tonnage TEUs	- -	- -	- -	3 (1)	53 (2)	56 (3)	24 (5)	151 (5)	175 (10)
ALL PORTS:	Tonnage TEUs	62330 (4,103)	57113 (3,857)	119443 (7,960)	65128 (4,235)	57991 (3,962)	123119 (8,197)	66424 (4,354)	58153 (4,092)	124577 (8,446)

Port	Unit	2017-2018			2018-2019			2019-2020*		
		Unloaded	Loaded	Total	Unloaded	Loaded	Total	Unloaded	Loaded	Total
KOLKATA	Tonnage TEUs	5263 (330)	4497 (310)	9760 (640)	5139 (330)	4795 (322)	9934 (652)	5334 (340)	4453 (335)	9787 (675)
HALDIA	Tonnage TEUs	1505 (72)	1167 (84)	2672 (156)	1762 (82)	1378 (96)	3140 (178)	1878 (83)	1156 (86)	3034 (169)
PARADIP	Tonnage TEUs	13 (4)	85 (3)	98 (7)	36 (7)	158 (6)	194 (13)	90 (6)	132 (6)	222 (12)
VISAKHAPATNAM	Tonnage TEUs	2859 (194)	3976 (195)	6835 (389)	3541 (227)	4418 (223)	7959 (450)	4085 (258)	4564 (246)	8649 (504)
KAMARAJAR(ENNORE)	Tonnage TEUs	43 (2)	9 (1)	52 (3)	795 (41)	306 (16)	1101 (57)	1860 (96)	664 (35)	2524 (131)
CHENNAI	Tonnage	17292	12613	29905	17775	13488	31263	14854	11856	26710

	TEUs	(896)	(653)	(1,549)	(921)	(699)	(1,620)	(770)	(614)	(1384)
V.O. CHIDAMBARANAR	Tonnage	5622	8569	14191	6056	8900	14956	7425	9011	16436
	TEUs	(348)	(350)	(698)	(371)	(368)	(739)	(403)	(401)	(804)
COCHIN	Tonnage	5266	2426	7692	5827	2288	8115	6205	2423	8628
	TEUs	(280)	(276)	(556)	(297)	(298)	(595)	(311)	(309)	(620)
NEW MANGALORE	Tonnage	1034	709	1743	1201	719	1920	1576	701	2277
	TEUs	(58)	(57)	(115)	(65)	(67)	(132)	(78)	(75)	(153)
MORMUGAO	Tonnage	261	164	425	321	146	467	312	105	417
	TEUs	(16)	(16)	(32)	(19)	(18)	(37)	(17)	(15)	(32)
MUMBAI	Tonnage	478	78	556	295	34	329	284	6	290
	TEUs	(39)	(3)	(42)	(26)	(1)	(27)	(26)	(1)	(27)
J.N.P.T.	Tonnage	31269	26597	57866	32975	29139	62114	34421	26519	60940
	TEUs	(2,	(2,	(4,	(2,	(2,	(5,	(2567)	(2464)	(5031)

		442)	391)	833)	595)	538)	133)			
DEENDAYAL	**Tonnage** **TEUs**	**320** **(61)**	**1518** **(57)**	**1838** **(118)**	**553** **(122)**	**3406** **(122)**	**3959** **(244)**	**733** **(224)**	**6286** **(222)**	**7019** **(446)**
ALL PORTS:	**Tonnage** **TEUs**	**71225** **(4,742)**	**62408** **(4,396)**	**133633** **(9,138)**	**76276** **(5,103)**	**69175** **(4,774)**	**145451** **(9,877)**	**79057** **(5,179)**	**67876** **(4,809)**	**146933** **(9,988)**