



## THE IMPACT OF MAJOR PORTS AND ITS OPERATIONAL FACILITIES ON THE INDIAN ECONOMY.

<sup>1</sup>Ms. Heena Murad Khanche, <sup>2</sup>Dr. Rinkoo Shantnu,

<sup>1</sup>Assistant Professor/ Research Scholar, <sup>2</sup>Associate Professor,

<sup>1</sup>Department of Business Economics,

<sup>1</sup>Pillai College of Arts, Commerce and Science (Autonomous), New Panvel, Maharashtra, India

**Abstract:** The Indian shipping industry plays a vital role in the Indian economy because it handles approximately more than 90% of the world trade for the country that consists of all the national and international trading activities thereby also including all the import and export activities. These import and export activities or international trade goes hand in hand with the India's port and its operational facilities, thereby, making it significant to understand the relationship of Indian port and its operational activities with the Indian Economy. The financial year of India begins from April and thus the data used in this research work consists of all the information for the shipping industry's turnover business annually as per the financial year, that is, April-March since 2016-17 till 2021-22.

**Purpose:** The purpose of this paper is to highlight the impact of ports and operational facilities on the Indian Economy during the post globalisation era and illuminate its significance for the Indian economy.

**Design and methodology:** The study is purely based on the secondary data collected through the annual reports generated by the Government of India, Ministry of Ports, Shipping and Waterways since the year 20016-17 till 2021-22. Several data tabulations, graphical representations and interpretation for the data were utilised in order to arrive at the conclusion for this research through interpretive research methodology which was further more analysed with the help of descriptive analysis.

**Findings:** The findings of the study are as stated below:

- Significance of Ports and its operational facilities in the shipping industry for the country India and its economy.
- Major ports and its operational facilities.
- Overseas Cargo Traffic (O.C.T.); Coastal Cargo Traffic (C.C.T.) and Total Cargo Traffic (T.C.T.)

**Practical implications:** The study is significant to gain an insight regarding the working of shipping industry of the country India round the clock to maintain the percolation of several cargos throughout the international market. The research paper has a further practical implications for the researchers to study further data of Indian ports and its operational facilities impact on the Indian economy, yet to be published by Government of India, Ministry of Ports, Shipping and waterways in the furthermore upcoming years.

**Keywords:** Shipping Industry, Major Ports, Operational facilities, Cargo Traffic, International trading patterns, Indian Economy, Gross Budgetary Support (GBS), Internal and Extra Budgetary Resources (IEBR), Budgetary Estimate (B.E).

### I. INTRODUCTION

India comprises a significant share and size under maritime sector with 12 major and 205 notified minor ports (non-major ports), which is situated along side its 7,500 kilometers wide coastline, thereby creating a vast network for navigable waterways for transportation and other purposes. Amongst the 12 major ports, each of the 6 ports are situated on the eastern and western coasts respectively. Looking towards the western coast, there are 6 ports namely situated at Mumbai Port, Kandla Port (Gujarat), New Mangalore Port, Nava Sheva JNPT (Jawaharlal Nehru Port), Mormugao Port (Goa) and Kochi port (Kerala); whereas looking towards the eastern coast, the 6 ports namely situated are at Chennai, Tuticorin (Tamil Nadu), Vishakhapatnam (Andhra Pradesh), Paradip (Odisha), Kolkata and Ennore (Tamil Nadu). One more significant port situated on the eastern coast is Port Blair, situated at Andaman and Nicobar Island. As per the constitution of India, the major ports of India comes under the union list whereas the non-major ports comes under the concurrent list of the Indian constitution. Hence, major ports of India are governed under the administrative control of the Indian government whereas the non-major ports are governed under the respective maritime state governments. Shipping plays an important role in the economic development of a country. India needs to focus on developing it to achieve the economic prosperity.

## II. SIGNIFICANCE OF THE STUDY

The Indian ports and shipping sector plays an important role in sustaining the growth of a country's trade and commerce. India is 16th largest maritime country in the whole world with a coastline of about 7,517 kms.

As per Alfred Marshall, the theory or principle of demand and supply plays a major role in understanding economy of any market situation or an economy of a country. India is second largest populated country in the world after China, and thus the demand for several goods, commodities and services is high as well, thereby a need to satisfy the consumption patterns of the individuals from the population arises. In order to attain the demand of several commodities, goods, and services, it is important to supply those goods, commodities and services to the population at a reasonable pricing strategy. This is where shipping sector comes into a major role to play its game in the market.

As per Alfred Marshall, higher the prices of goods, commodities, or services, lower is the demand and lower the prices of goods, commodities or services, higher is the demand for such commodities, goods or services. If we take any modes of transportation for the movement of bulk quantities of goods and commodities, for instance, road transportation, air transportation etc. this shall lead to an increase in cost, as these modes of transportation firstly cannot carry bulk quantities thereby leading them to increase their number of inwards or outwards transportation cost. An increase in transportation cost would lead to an increase in the pricing of good or commodities, thereby leading to a decline in demand for such goods, commodities or services impacting the economy of the market, further resulting to an impact in the overall economy of the country.

Shipping sector are known for transporting goods, commodities, or services at bulk quantities at cheaper rates through water ways worldwide leading to an increase in imports and exports of goods, further leading to an increase in FDIs (Foreign Direct Investments) in the economy.

The Government of India plays a vital role in supporting the shipping sector of India. The Indian government has allowed FDIs of upto 100% under the automated route for ports and harbour construction and maintenance projects. Government of India has also facilitated a ten years tax holiday for enterprises who develop, maintain, and operate through ports, inland waterways and inland ports.

The Government of India has taken various measures in order to improvise operational effectiveness and efficiency through mechanization, deepening of drafts and speedy evacuations. Thus, it is of great significance to study the shipping sector of India and the major ports which are responsible for the major operations behind the shipping sector and economy of our country India.

## III. REVIEW OF LITERATURE

The study includes review of literature relating purely to shipping industry of India, its major port's operations, and its impact on the Indian economy. There are few studies which has a main focus on the working and effectiveness of the major ports in India and its impact on the country India's governance, competitiveness, and implications with reference to the international maritime network, and as such according to Ainsworth (1992)<sup>1</sup>, ports must offer high service standards to ensure that inventories of enterprises' raw materials, intermediary items, and finished goods are reduced. Nonetheless, from a logistics perspective, ports are supply chain logistics systems that must respond to pull logistics; their activity will help to lower inventory levels along the logistical pipeline. Ports should be able to add value rather than incur expenses. Ports in India need to restructure their operations with institutional reforms, as per Heralambides and Behrens's point of view (2000)<sup>2</sup> in order to be more appealing to users and investors. Paixo and Marlow (2003)<sup>3</sup> concluded that ports must revitalize their services and become more agile or risk losing cargo to another mode of transportation. This was demonstrated when the Haldia Dock Complex, a major port in India, failed to provide the required draught to crude oil carriers and lost cargo handling to the port of Paradip, from which the oil is pipelined to the Haldia refineries. According to Anto, Soares, and Gerretsen (2005)<sup>4</sup>, efficiency level measurements are confined to quantitative aspects, but qualitative indicators are also required. R. Midoro et al. (2005)<sup>5</sup> focused about the vertical integration and co-relation between global carriers and terminal operators of the maritime industry in the international trading business. Thai (2007)<sup>6</sup> stated that if security measures and initiatives are not carefully designed and effectively implemented, they can have an impact on port performance. This can have a negative impact on the entire maritime transportation chain. On the contrary, R. Sharma and O.P. Shah (2008)<sup>7</sup> analyzed the port operations and planning for the development of an integrated container shipping model for Indian ports. Similarly, Adolf K.Y. Ng and Girish C. Gujar (2009)<sup>8</sup> critically analyzed the cases relating to the dry ports of India and its close relativity with the government's policies, efficiency and competitiveness with reference to the world trade. In their paper, Li, Chen, Liu, and Sun (2010)<sup>9</sup> examined the port supply chain simulation. They demonstrated that the capability limits of a port have a significant impact on the operation of the supply chain. Second, investing in removing or minimizing limits, particularly bottlenecks, can yield large profits, and the exact value can be calculated using simulation. Third, in terms of supply chain management, an investment for stakeholders can sometimes result in significant profits for a port. It is beneficial to evaluate some investments systematically in order to make sound investment decisions for port enterprises. In recent years, academics have paid a lot of attention to supply chain modelling. According to Sha and Huang (2010)<sup>10</sup>, a port is a system comprised of three subsystems: time, quality, and profit. They proposed an SD model with three primary goals in mind: ensuring service time, improving quality, and lowering port service costs. Li and Wang (2012)<sup>11</sup> investigated the dynamic effect of ports on urban economies using system dynamics. They used a combination of system dynamics, the input-output method, the multiplier, and an econometrics model. They forecast the dynamic impact of Zhuhai Port on the urban economy by 2025 and make recommendations for Zhuhai Port development. Port performance measurements are relevant to port users, policymakers, port developers, shippers, and other stakeholders (De Langen and Sharypova, 2013)<sup>12</sup>. Park, Wang, Yeo, and Adolf (2014)<sup>13</sup> used a simulation of an SD model to determine investment needs for ship operators. They concluded that putting large ships into service improves customer service. Dasgupta and Sinha (2016)<sup>14</sup> proposed that TRT (turn round time) or TAT (turnaround time) of ships in a port is a key performance indicator of a port in their study of the impact of privatization on the efficiency of ports in India. A port with a lower TRT/TAT is more efficient. Furthermore, privatization of port services alone does not result in increased port efficiency; it must be accompanied by optimal resource utilization and effective process deployment. Ha et al. (2019)<sup>15</sup> postulated a port performance measurement instrument based on the importance and performance of major container ports in South Korea. From a multi-stakeholder perspective, several port performance indicators were used in the study. Vaggelas (2019)<sup>16</sup> established a framework for port performance from the standpoint of shipping companies, encompassing various attributes such as port safety, physical

characteristics, connectivity, and so on. Duru et al. (2020)<sup>17</sup> established an extensive framework for evaluating port performance through the use of quality function deployment. They looked at the issues from the standpoints of terminal operators, labour, cargo owners, shipping companies, inland carriers, and the government. The study examined all aspects of port performance, including market indicators, financial indicators, technical, operational, environmental, social, political, and hinterland indicators. Iyer and Nanyam (2021)<sup>18</sup> carried out comprehensive study and used a holistic case-based methodology to determine the influencing factors, inhibiting factors, and performance indicators impacting container terminal operational performance in India. The individual and combined effects of the parameters indicated on the operational performance of the container terminals are not taken into account by Nanyam and Jha (2022)<sup>19</sup> in their analysis. Also, they have not taken into account the container terminal's physical attributes, which are crucial in determining the terminals' performance. So, it was necessary to consider these aspects and comprehend their individual and combined effects on the operation of the container terminal, which led to the hypothesis of this study.

#### IV. OBJECTIVES OF THE STUDY

- i. To illuminate an insight regarding the working of shipping industry and ports in India.
- ii. To study the ports and its operational facilities impact on the economy of India.
- iii. To compare, evaluate and analyse the ports operations and shipping industries performance on the economy of India within the time frame of the year up till 2020-21.
- iv. To study the significance of Indian ports acting as a nexus for supply and demand in the markets globally.

#### V. SCOPE OF THE STUDY

- i. The conceptual scope of study is with reference to shipping industry, ports, and its operational facilities of the country India only.
- ii. The conceptual scope of study extends to the economy of the country India.
- iii. There is a vast theoretical scope of this study as it includes several budgetary outlays impacting the Indian economy with reference to the Indian shipping industry.

#### VI. RESEARCH METHODOLOGY

- i. SOURCES OF DATA COLLECTION: Secondary Data collection: Journals, Websites, e-library etc.
- ii. STUDY TOOLS AND TECHNIQUES: Table, Graphs, Diagrams.
- iii. METHODOLOGY AND ANALYSIS: Interpretive Methodology, Descriptive Analysis

#### VII. LIMITATIONS OF THE STUDY

- i. The study is conceptually limited to the concept of shipping industry, ports, operational facilities, and economy of the country India.
- ii. The research is limited to ports and operational facilities of the shipping industry of India.
- iii. The research is limited within the time frames of the year till 2020-21.
- iv. The study is purely confined, limited, and based upon Secondary source of data collection.

#### VIII. HYPOTHESES OF THE STUDY

As research methodology used in this study is based on Interpretive research methodology and the nature of analysis adopted is Descriptive Analysis, thus, no hypothesis has been generated for this study.

**IX. DATA PROCESSING, DATA ANALYSIS AND INTERPRETATION****INTERPRETIVE RESEARCH METHODOLOGY AND DESCRIPTIVE ANALYSIS.****i. Gross Budgetary Support (GBS) and Internal and Extra Budgetary Resources (IEBR) Outlay:**

The Ministry's budget estimate of Gross Budgetary Support (GBS) for FY 2020-2021 was Rs.1800.00 crore. However, at the Revised Estimate (RE) stage, this figure has been reduced to Rs. 1433.65 crore. Actual expenditure as of 31.12.2020 was Rs.902.22 crore, compared to the RE allocation of Rs.1423.65 crore. The following is a summary of GBS and Internal & Extra Budgetary Resources (IEBR) outlay for 2020-2021:

**TABLE 1: GROSS BUDGETARY SUPPORT (GBS) AND INTERNAL AND EXTRA BUDGETARY RESOURCES (IEBR) OUTLAY**

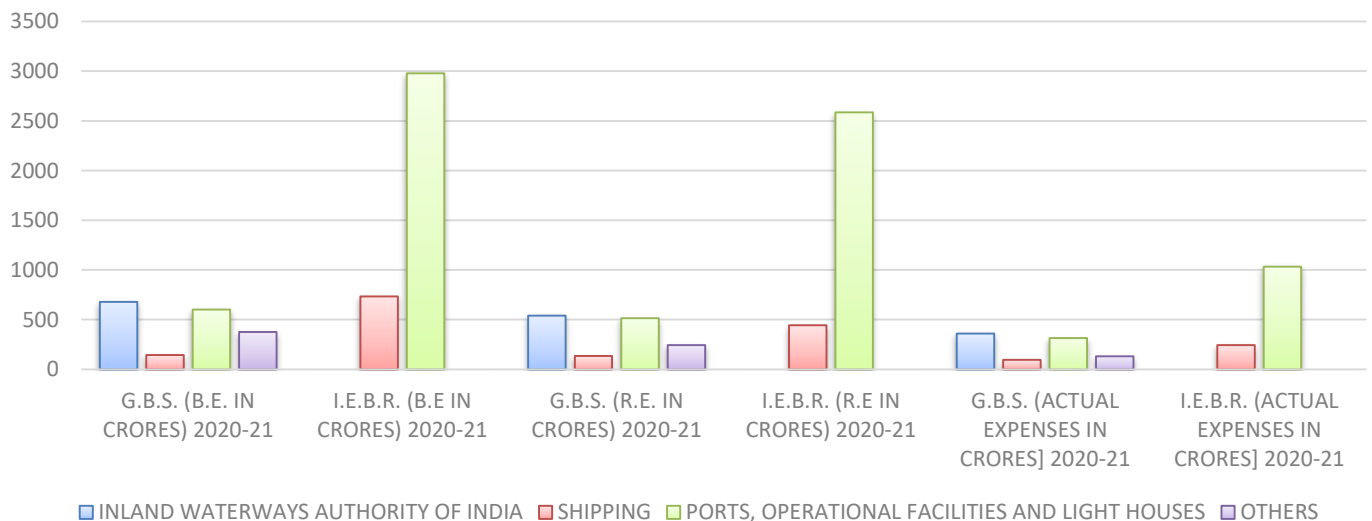
SECTOR	2020-2021 (B.E) [In Crores]		2020-21 (R.E) [In Crores]		2020 (ACTUAL EXPENSES) [In Crores]	
	GBS	IEBR	GBS	IEBR	GBS	IEBR
Inland Waterways Authority of India (IWAI)	678.30	Nil	541.20	Nil	360.28	Nil
Shipping	144.70	735.00	134.70	445.00	95.53	242.77
Ports, operational facilities, and Light Houses	601.10	2979.83	513.59	2584.26	315.29	1032.36
Others	375.90	Nil	244.16	Nil	131.12	Nil
<b>TOTAL</b>	<b>1800.00</b>	<b>3714.83</b>	<b>1433.65</b>	<b>3029.26</b>	<b>902.22</b>	<b>1275.13</b>

*Source: Compiled using Annual Reports from Ministry of Ports, Shipping and Waterways*

*Note: Above data includes details up till 31<sup>st</sup> December 2020*

**INTERPRETATION:**

The above tabulated data shows Gross Budgetary Support and Internal and Extra Budgetary Resources detailed information in Crores with sub-division details of Budgetary Estimate (B.E.), Revised Estimate (R.E.) and Actual Expenses (A.E) throughout the several sectors of Indian shipping industry such as Inland waterways authority of India, Shipping; Ports, operational facilities and light houses and other categorization. The researchers collected data through secondary source of data collection, which was availed through the Annual Reports from Ministry of Ports, Shipping and Waterways. The researchers have made a comparative analysis for different sectors expense estimate to determine the economic impact of Shipping industry, ports and operational facility on the economy of the country. The tabulation shows that the government of India has made a significant investment planning for different sector yearly to make it a developmental led supportive system for the boost of the country's economy.

**GRAPH 1: COMPARATIVE ANALYSIS FOR GROSS BUDGETARY SUPPORT (GBS) AND INTERNAL AND EXTRA BUDGETARY RESOURCES (IEBR) OUTLAY.****GRAPH 1: GROSS BUDGETARY SUPPORT (G.B.S.) and INTERNAL & EXTRA BUDGETARY RESOURCES OUTLAY (I.E.B.R.)**

*Source: Compiled using Annual Reports from Ministry of Ports, Shipping and Waterways*

*Note: Above data includes details up till 31<sup>st</sup> December 2020*

INTERPRETATION:

Graph 1 indicates the transformative analysis of tabular format for Gross Budgetary Support and Internal and Extra Budgetary Resources detailed information in Crores with sub-division details of Budgetary Estimate (B.E.), Revised Estimate (R.E.) and Actual Expenses (A.E) throughout the several sectors of Indian shipping industry such as Inland waterways authority of India, Shipping; Ports, operational facilities and light houses and other categorization for the year of 2020-21. It can be observed in the graph the maximum investment in each criterion for several budgetary categorization is maximum in Ports, operational facilities and light houses as compared to the other categorization of Inland waterways authority, Shipping industry alone and other categorization summarized. The comparative analysis in between the budgetary estimates, revised estimates and that of actual expenses also shows maximum inclination towards ports, operational facilities and light houses wherein budgetary estimate and revised estimates were maximum as compared with the actual expenses.

ii. **Outlay for 2020-21:**

The details of total GBS and IEBR outlay details for 2021-2022 are given below: -

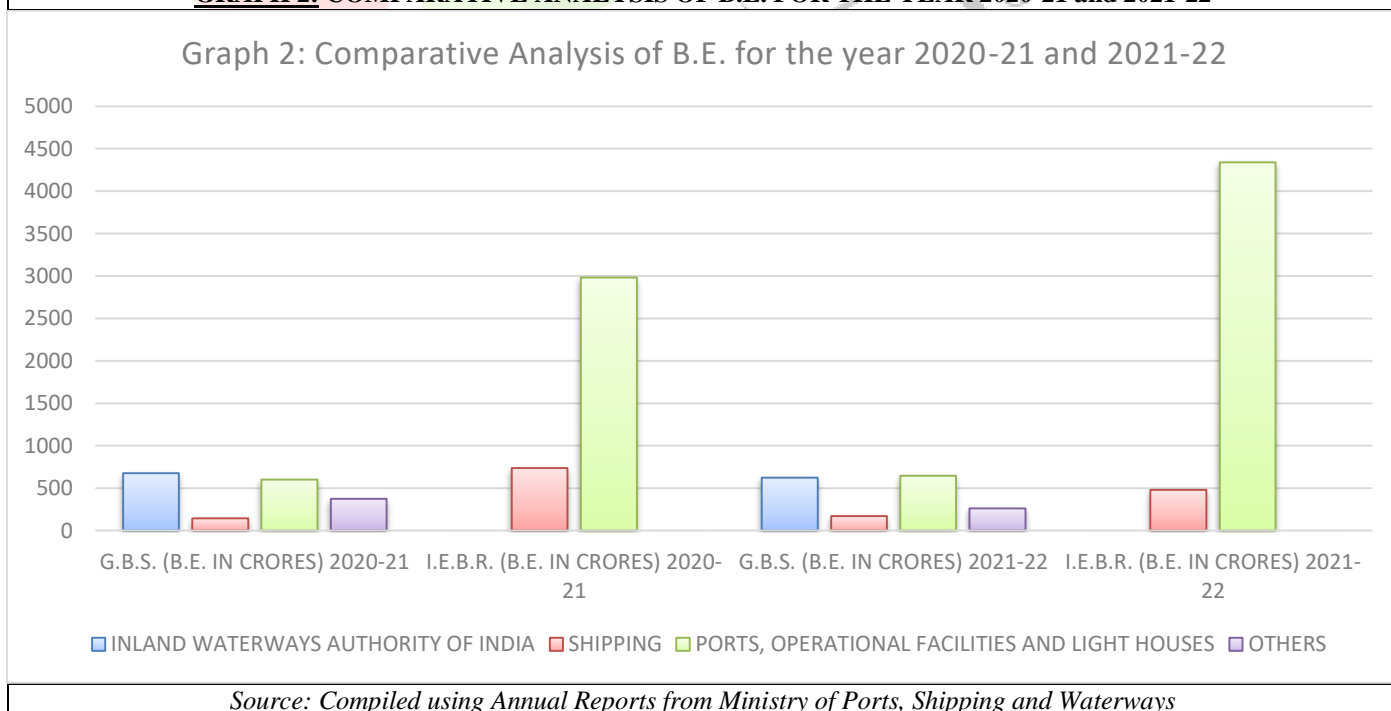
SECTOR	2021-2022 (B.E.) [In Crores]	
	GBS	IEBR
Ports, operational facilities & Light-houses	647.50	4337.12
Shipping	171.25	480.00
Inland Waterways Authority of India (IWAI)	623.60	0.00
Others	260.00	0.00
<b>Total</b>	<b>1702.35</b>	<b>4817.12</b>

*Source: Compiled using Annual Reports from Ministry of Ports, Shipping and Waterways*

INTERPRETATION:

The above tabulated data depicts the Budgetary Estimate (B.E.) for the year 2021-22 in the similar categorization of the year 2020-21, that is, Gross Budgetary Support (G.B.S.) and Internal and Extra Budgetary Resources having sub-categorization in between Ports, operational facilities and light houses, shipping, Inland Waterways Authority of India, and others criterion. The researcher tried to evaluate and cross-analyze the Budgetary Expenses of 2020-21 and 2021-22 and as seen in Table1 and Table 2, the maximum budgetary investment done by the government in the overall Shipping annual managerial expenses is towards the development and maintenance of Ports, operational facilities, and Light houses. In the year 2020-21 based on Table 1: B.E, the average G.B.S. towards Ports, operational facilities, and light houses were 601.10 Crores and the average I.E.B.R. towards Ports, operational facilities and light houses were 2979.83 Crores. On the other hand, if we observe the same data Budgetary Estimate (B.E.) for the 2021-22, the average G.B.S has been raised and increased as compared to previous year to 647.50 Crores and the average I.E.B.R. towards Ports, operational facilities and light houses has been almost doubled as compared to previous year to 4337.12 Crores. This indicates the planning of Government for port led developmental planning for coming years ahead to increase the trading business further more impacting positively to the economy of the country.

**GRAPH 2: COMPARATIVE ANALYSIS OF B.E. FOR THE YEAR 2020-21 and 2021-22**



INTERPRETATION:

Graph 2 indicates the direct comparative analysis in between the B.E. from tabular data of Table 1 and data from Table 2 signifying the growth of budgetary estimated planning and estimation link and inclination majorly towards ports, operational facilities and light houses expenses and investment support. It can be observed with the help of Graph 2, that there has been only an increased upward inclining bars signifying the growth and development of ports, operational facilities, and light houses in the country India over the time frame of 2020-21 and 2021-22. The other categorization for shipping perspective has also budgetary estimation and plans though not as much or as equivalent to ports, operational facilities and light houses as it can be observed in the Graph 2 that the only bar at the top and highest of all in a constant manner is for the ports, operational facilities and light houses specifically for the criterions of Internal and External Budgetary Resources (I.E.B.R.) for both the comparative years, that is, 2020-21 and 2021-22 signifying its further more importance.

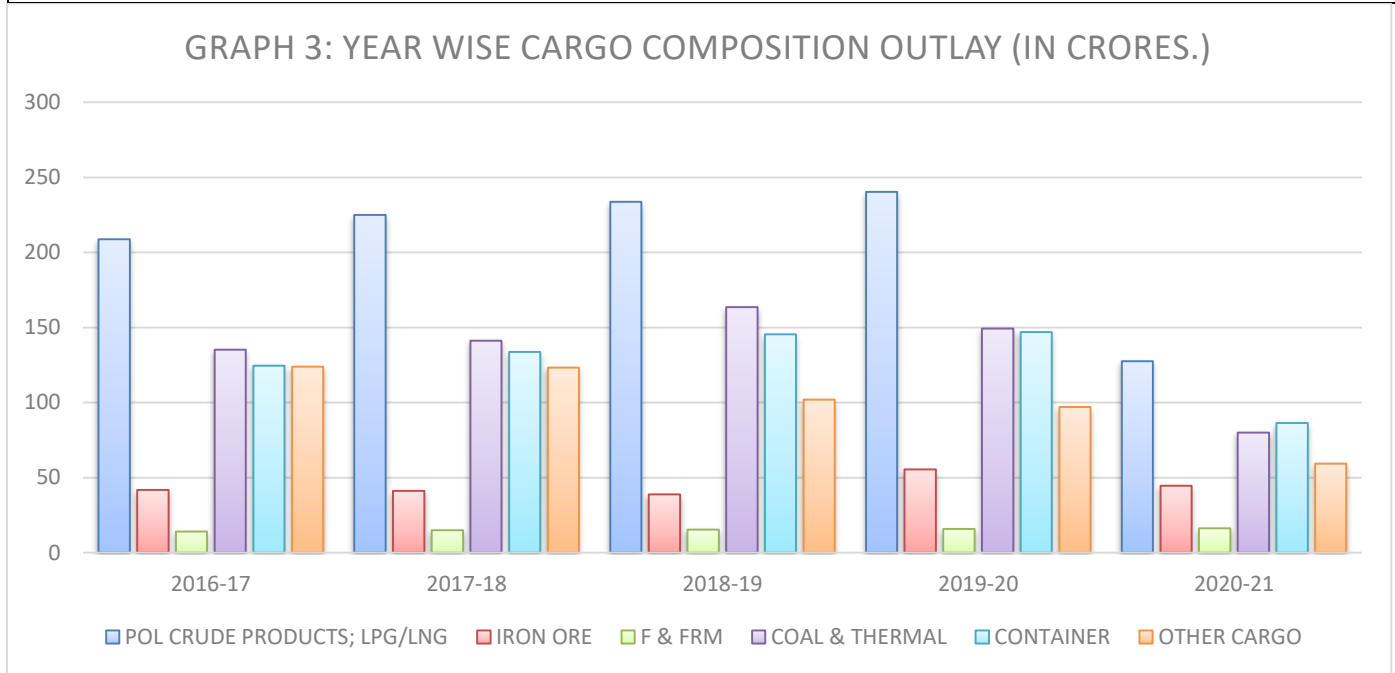
### iii. Commodity wise Cargo-Traffic:

12 Major Ports handled 414.20 million tonnes of traffic in 2020-21, up to November 2020, compared to 463.73 million tonnes in the previous year's similar period. The cargo's makeup is as follows:

<b>YEAR WISE CARGO COMPOSITION</b>	<b>2016-17 [In Crores]</b>	<b>2017-18 [In Crores]</b>	<b>2018-19 [In Crores]</b>	<b>2019-20 [In Crores]</b>	<b>2020-21 [In Crores]</b>
POL Crude products and LPG/LNG	208.87	224.92	233.77	240.27	127.61
Iron Ore	41.77	41.17	38.81	55.51	44.71
F&FRM (Dry) including Fertilizer, FRM (Dry and Liquid)	14.06	15.05	15.41	15.92	16.29
Coal and Thermal	135.27	141.23	163.67	149.30	79.90
Container (In Million TEUs)	124.66 (8.44)	133.73 (9.14)	145.52 (9.88)	146.88 (9.97)	86.37 (5.75)
Other Cargo	123.85	123.37	101.99	97.05	59.32
<b>Total</b>	<b>648.47</b>	<b>679.47</b>	<b>699.17</b>	<b>704.93</b>	<b>414.20</b>
<i>Source: Compiled using Update on Indian Port Sector (31.03.2020) and Port Data Management Portal</i>					
<i>Note: Above data includes details up till 31<sup>st</sup> December 2020</i>					

#### INTERPRETATION:

While commodity traffic for POL Crude, Coal, Iron Ore, F&FRM (Dry), and Containers has increased steadily in recent years, traffic for Other Cargo has decreased steadily. During 2019-20, Jawaharlal Nehru Port Trust (JNPT) remained to be the leading container handling port in the country, with a share of roughly 41%, followed by Chennai (18%), and the remaining 41% handled by other major ports. Table 2 clearly indicates the outlay for year wise cargo composition with reference to several commodities such as POL Crude products: LPG/LNG, Iron ore, F & FRM (Dry) including fertilizers, FRM (Dry and Liquid), Coal and thermal, Containers and other cargoes. As viewed in the table the turnover has only increased over the years except that of 2020-21 being the data collected by Indian Port Sector and Port Data management portal only up till 31<sup>st</sup> December 2020 whereas rest of the years turnover is for the entire financial year 1<sup>st</sup> April to 31<sup>st</sup> March. The 2020-21 data lacks the information from January 2021- March 2021, thereby gaining a turnover of 414.20 Crores despite being the time of Covid Pandemic which itself displays a huge significance of port's impact on our country's economy.

**GRAPH 3: OUTLAY FOR COMMODITY WISE CARGO TRAFFIC ON INDIAN PORT OVER THE TENURE OF 5 YEARS [2016-17 to 2020-21]**

*Source: Compiled using Update on Indian Port Sector (31.03.2020) and Port Data Management Portal*

*Note: Above data includes details up till 31<sup>st</sup> December 2020*

#### INTERPRETATION:

Graph 3 indicates the outlay for year wise cargo composition over the tenure period of 5 years ranging from 2016-17 to 2020-21 signifying the Indian port's turnover and thereby its impact on the nation's economy because the larger the turnover through these ports the larger is the co-relation of the same with the transactions of imports and exports of a country. It can be observed through the graph that the largest turnover of a commodity or product amongst all the commodities or cargoes is POL crude product, LPG/LNG thereby indicating its major utilization and enhanced curve for demand and supply across the nations around the world. However, the indications for the several commodity and cargo indicators are lowest in the year 2020-21 as compared to the indicators in the previous years because of the data collection only up till 31<sup>st</sup> December as suggested earlier in the tabular data 1 interpretation and the reason of Covid Pandemic. On the contrary, looking at the brighter side despite the lockdown and pandemic situation the Indian ports still did see a significant turnover even though less but still not null and void which depicts the significance of ports acting as the lifeline for our country's economy.

#### X. CONCLUSION

In conclusion, the Indian ports and operational facilities of the shipping industry have a profound impact on the economy of India. These ports serve as crucial nodes in the country's trade network, facilitating the movement of goods and connecting India to global markets. The efficient functioning of these ports and operational facilities is essential for driving economic growth and development. Firstly, Indian ports play a pivotal role in international trade, handling a significant portion of the country's import and export activities. The smooth and efficient operation of these ports ensures the timely clearance and movement of goods, reducing trade barriers and enabling seamless trade transactions. This, in turn, contributes to the overall balance of trade, strengthens India's position in the global economy, and stimulates economic growth.

Secondly, the shipping industry and associated port activities create numerous employment opportunities across various sectors. Directly, the ports generate employment in areas such as cargo handling, port administration, and logistics. Indirectly, the industry generates jobs in transportation, warehousing, manufacturing, and other related sectors. The availability of employment opportunities contributes to poverty reduction, enhances livelihoods, and promotes inclusive economic development.

Thirdly, the presence of well-developed ports and operational facilities enhances India's overall infrastructure. These facilities attract investment and encourage businesses to establish their operations near the ports, leading to the development of industrial clusters and promoting regional growth. Additionally, efficient port infrastructure ensures smoother supply chains, reduces transportation costs, and enhances the competitiveness of domestic industries.

Furthermore, the revenue generated through port operations, including customs duties, tariffs, and port fees, contributes to the government's revenue streams. These funds can be channelled towards infrastructure development, social welfare programs, and public services, benefiting the overall socio-economic development of the country.

However, challenges such as port congestion, inadequate hinterland connectivity, bureaucratic procedures, and outdated technology need to be addressed to fully unlock the potential of Indian ports and operational facilities. Continued investments in port infrastructure, technological advancements, and policy reforms are crucial to optimize the efficiency and competitiveness of the shipping industry, further bolstering the economy of India.

In conclusion, the Indian ports and operational facilities in the shipping industry are indispensable components of the country's economic landscape. They facilitate international trade, generate employment, improve infrastructure, and contribute to government revenue. Nurturing and developing these vital assets will not only stimulate economic growth but also foster sustainable and inclusive development for India.

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