

Transportation Technologies –Optimization and
Challenges
TRANSTECH-12

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SUB-THEME:

Recent Trends in Development of Shipping Infrastructure in Indian Subcontinent

INDIAN SHIPPING

Vision to Make INDIA a Global Shipping Destination



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Paper guide:

Today, India's exports & increase trade, there is a real need as they form the main gateway. Dr. B.V. Ramalingeswara Rao, an eminent shipping expert, has expressed unprecedented interest both from strategic buyers, including international liners, terminal operators, captive players, banks and infrastructure funds. The Government of India is planning to **invest about \$20.8 billion in 276 projects** which are part of the government's endeavor to expand 13 major ports in the country. With a vast coastline spanning 7500 kilometers, rapid economic growth and technological advancements in the shipping industry as well as in all the related fields pose major challenges and exacting demands on infrastructure creation, human resource development, facilities for training, research and design studies, etc. in the **areas of port infrastructure**.

KEYWORDS:

Investment	Standardization
Shipping	Globalization
Infrastructure	Technology

INTRODUCTION

In this report we provide a unique focus on the key challenges facing government and industry today:

Efficiency: using best practices and cutting-edge technologies to ensure that waste is minimized and optimal efficiencies are achieved from the earliest stages of design, throughout project delivery, and onto successful ongoing operation

Sustainability: understanding the drive to achieve sustainability and examining how this can be accomplished without undue expense.

Value: Managing every element of an infrastructure project to ensure that it remains cost-effective in both the short and long-term, and represents real value for money

These three parameters are vital to the growth of shipping in India.

The development of modern ports along the coasts of the nation has just heralded the era of modern ship building in India. And the Use of new & advanced equipment is innate if any country has to develop in the Modern shipping arena. We focus in our report on the improvement and up gradation & economics of

- Equipment
- Materials
- Machinery

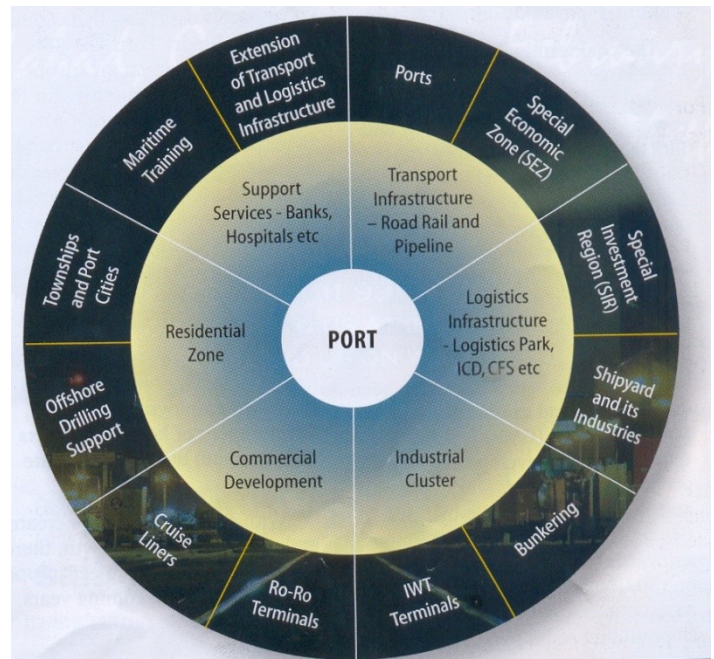
Required for the kind of development India is expecting.

CURRENT STATE OF INDIAN SHIPPING AND PORTS

The 7,500 km long Indian coastline has 13 major ports and 181 minor/ intermediate ports out of which 139 are operable. Indian Ports are the gateways to India's international trade by sea and are handling over 90% of foreign trade.

The major ports are located at Calcutta/ Haldia, Chennai, Cochin, Ennore, Jawaharlal Nehru Port at Nhava Sheva, Kandla, Mormugao, Mumbai, New Mangalore, Paradip, Tuticorin and Vishakhapatnam.

The 13 major Indian ports, which are managed by the Port Trust of India under Central Government jurisdiction, handle 90 percent of the all-India port throughput, and thus bear the brunt of sea borne trade. The 139 minor ports are under the jurisdiction of the respective State Governments. Dry and liquid bulk make up about 80 percent of the port traffic in volume with general cargo, including the containerised cargo, constituting the remaining traffic.



Though the bulk of Indian trade is carried by sea routes, the existing port infrastructure is insufficient to handle trade flows effectively. The current capacity at major ports is overstretched. The major ports together have a capacity of 215 million metric tonnes (MMT) at 1997- 98 levels. During 2001- 2002, the total cargo handled at major ports was 287.56 million tonnes as against 281.10 million tonnes during 2000- 2001. The traffic for total ports in India was worth 740.3 million tons (MT) in 2009 and this is expected to rise to 1,373.1 MT in 2015. Traffic at major ports is expected to grow at a compound annual growth rate (CAGR) of 7.6 percent from 2010 to 2015.

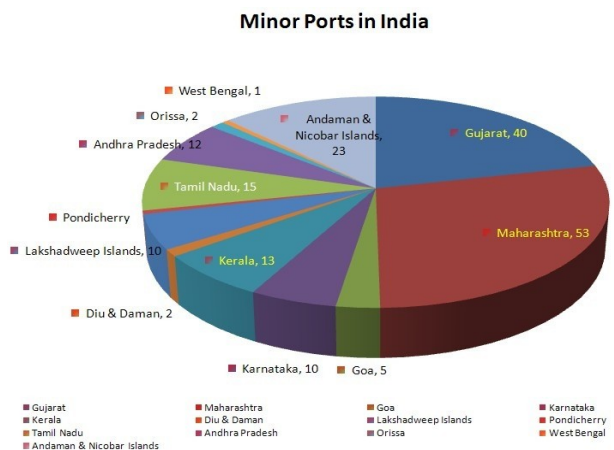
The Indian ports sector is poised for significant growth driven by new manufacturing and power projects and higher cargo traffic at ports. Increase in containerized trade coupled with the Government's active initiatives to develop the Indian ports sector, is expected to further boost the growth. The commissioning of power projects based on imported coal and the setting up of steel projects and offshore exploration and production projects are likely to drive the Indian ports sector.

The situation of limited capacity and high demand has inevitably resulted in port congestion. This results in overstretched berths leading to pre-berthing delays and longer ship turnaround time. In recent years, major investments in port construction have centred on container as well as bulk facilities. Modern equipment exists for container and bulk handling. The equipment- mix for handling general cargo has to be planned and provided in a manner that suits the needs of each port.

However, several major ports lack sufficient draft for large crude tankers. Large vessels are berthed at Colombo, Singapore, or Dubai, and cargo is shipped to India later in smaller vessels, thereby escalating the freight cost. Additionally, all leading ports such as Mumbai, Jawaharlal Nehru Port Trust (JNPT), Visakhapatnam, and Mormugao handle more cargo than their designed capacities, further contributing to congestion and resulting in a longer turnaround time.

Weak hinterland connectivity is a challenge for most Indian ports, reducing accessibility. Despite investments from the private sector that are encouraging the modernization and development of ports, infrastructure continues to be a major issue.

The Indian Government prioritized the expansion and modernization of ports as part of its five-year plan initiatives in 2007. It has been instrumental in redefining the role of ports from mere trade gateways to integral parts of the global and logistics chain. The Committee of Infrastructure constituted a Committee of Secretaries to recommend time-bound identification and complete connectivity projects to successfully address issues regarding port connectivity. Several projects are underway for the deepening of drafts at major ports as a part of the national maritime development program.



The productivity of ports in terms of **Average Ship Turn around (ASTA)** and **Average Ship Berth Output (ASBO)** has improved in past years. The ASTA has decreased from 8.1 days in 1990- 91 to 7.8 days in 1996-97 to 5.06 days in 1998-99 and further to 4.72 days in 1999-2000 (April-Sept). The average ASBO increased from 3372 tonnes in 1990-91 to 4,249 tonnes in 1996- 97.

Although the ports in India have shown considerable improvement over years, benchmarking them against the ports in Hong Kong, Los Angeles, and Rotterdam reveals that there needs to be marked improvement in many parameters to get Indian ports at par with international standards.

The performance of Indian ports does not compare favourably with that of efficient international ports. On **three important parameters- capacity, productivity and efficiency**, Indian ports lack in comparison to some of the major international ports. In international terms, labour and equipment productivity levels are still very low due to the outdated equipment, poor training, low equipment handling levels by labour, uneconomic labour practices, idle time at berth, time loss at shift change and high mining scales and low datum.

DEVELOPMENT OF PORTS & SHIPPING IN INDIA

PRIVATE SECTOR PARTICIPATION

In keeping with general policy of liberalisation and globalisation of economy of the Government of India, the Port sector has been thrown open to private sector participation. Private Sector participation in provision of port facilities at various major ports is envisaged in a big way. There is no legal bar to private sector participation in port facilities as per the provisions of the existing Major Port Trusts Act, 1963.

The government has been promoting public-private participation in the ports sector on a build-operate-transfer (BOT) basis, thereby stepping-up capacities and traffic handling at ports, besides enhancing their efficiency.

In order to handle the increase in the sea-borne traffic on account of increase in foreign and coastal trade, major expansion is required in the port infrastructure sector in the country and this will need mobilisation of substantial resources. Hence, the opening up of the port sector for privatisation. It is expected that privatisation would also improve the efficiency, productivity and quality of services and also bring competitiveness in port services. It is also expected that the private sector participation would help bringing in latest technology and improved management techniques. It is felt necessary to encourage the private sector participation in enhancing port capabilities and also in modernisation of port equipment.

FOLLOWING ARE THE DEVELOPMENTS CURRENTLY IN INDIAN PORTS

The **port expansion project** of the **Adani Group-owned Mundra Port and Special Economic Zone Limited (MPSEZL)** has **achieved financial closure**. The expansion plan of the port, which involves expanding infrastructure facilities and augmenting mechanisation facilities, is estimated to cost Rs 12 billion. Of the total project cost, Rs 8 billion has been arranged through debt and the balance Rs 4 billion is being raised through internal accruals. The company has arranged its Rs 8 billion debt from seven banks – State Bank of India, Canara Bank, Allahabad Bank, Syndicate bank, Corporation Bank and State Bank of Hyderabad. The port expansion programme involves adding four bulk cargo berths and two container berths, acquiring two tugs and four mobile harbour cranes and increasing the port's cargo handling capacity to 50 million tonne per annum (mtpa).

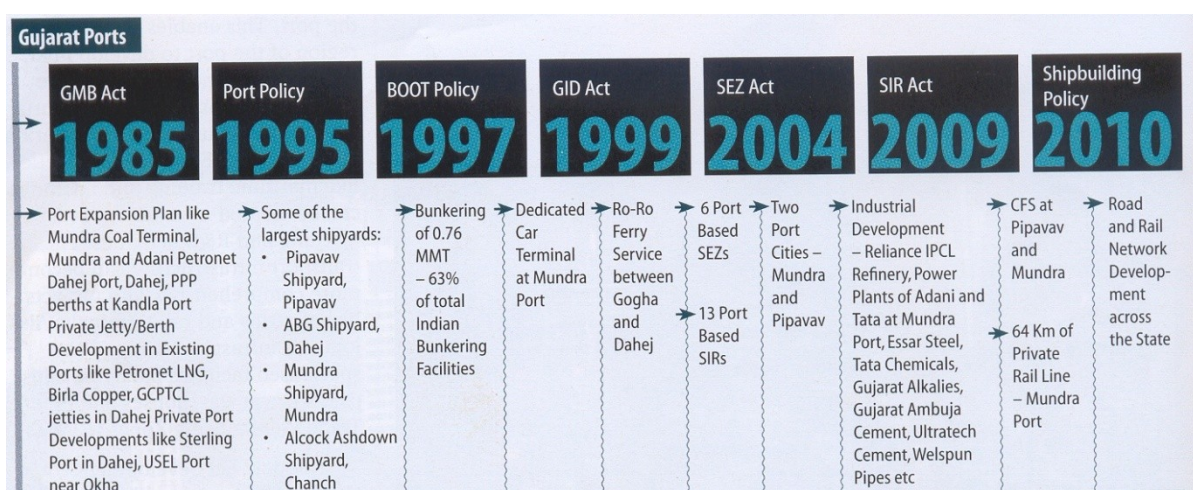
Reliance Logistics Investment, a Reliance Group company, and **Jai Corporation**, have jointly **bought a 51-per cent stake in Rewas port**. There will be fresh issue of equity at par with the new partners. The first phase will cost Rs 25 billion. Future investments in the project will be tied up by the new partners. The port is presently awaiting environmental clearance from the Union Government. Construction work is likely to begin in October 2006 and the total investments in the two phases will be around Rs 50 billion.

The **Mumbai Port Trust (MbPT)** has **submitted development plans** amounting to **Rs 4.69 billion** to the **Union Government for final approval**. Among the plans are the Rs 1.52-billion new cruise terminal, the Rs 1.50-billion fifth oil berth at Jawahar Dweep and the Rs 1.50-billion redevelopment of the BPX and BPS berths. The projects also involve the redevelopment of the harbour wall berths, encompassing upgrading four harbour wall berths at Indira Dock to handle large and deep-draft vessels, and construction of a second berth for handling chemicals. These five projects, for which consultants will be appointed soon to prepare detailed feasibility reports, are expected to be ready by 2009-10. The proposed projects will be scrutinised by the Public Investment Board (PIB), which will then forward them with its recommendations to the Cabinet Committee.

The **Jawaharalal Nehru Port Trust (JNPT)** is **planning to create an additional berth by extending the existing container berth by 330 metre**. The estimated cost to develop the facility is Rs 5 billion. UTI Bank is advising the port on the extension of a container berth, which will enhance its capacity by around 7.2 million tonne. At present, the container berth of 1,280 metre is shared by JNPT and private terminal operator Dubai Ports World. Whether the **News Ports & Shipping News** extension will be a new facility or shared by the existing operator is still unsure as the project might not all-together turnout positive for JNPT.

JNPT is planning to float a joint venture with Dubai Ports World and a consortium of **Maersk India and Container Corporation of India** for a common rail operator service to ease congestion at the port.

The **Gujarat government is expected to augment the facilities of the Porbandar port**, managed by the Gujarat Maritime Board (GMB), by **dredging and providing more berths**. In this regard, the Porbandar District Chamber of Commerce and Industries has called for expeditious development of the port. The Chamber believes that the all-weather port which exports clinker, cement, bauxite and fish as well as imports coal throughout the year as well as handles cargo of 2.1 million tonne per annum has the potential to achieve maximum traffic among the slew of smaller ports in the state.



DEVELOPMENT OF SHIPPING IN INDIA

ABG Shipyard and Bharati Shipyard have **expressed interest in partnering the Rs 4-billion project of the Kandla Port Trust (KPT) to develop a mega shipyard and ship repair facility on BOT basis at Tuna in Gujarat**. However, the port trust is yet to invite global tenders for the project. Tuna shipyard is being envisaged under the National Maritime Development Programme (NMDP). It includes two repair jetties with a length of 500-600 metre and two graving dry docks 250-metre long and 45-metre wide. While the techno-economic feasibility for the shipyard has been completed, KPT will soon appoint an advisor to prepare the tender documents, which will be floated in five to six months for developing Tuna shipyard.

The **Tuticorin Port Trust is planning to establish a shipbuilding yard at an outlay of Rs 14 billion**. This yard will be established on build-operate-transfer (BOT) or lease basis on

49.68 hectare. The yard will have a building dock of 390 metre in length, 65 metre in breadth and 10 metre in height and five berths with a total length of 1,200 metre. Korea Maritime Consultants Company Limited submitted the feasibility study last week. The construction of the yard is expected to be completed in four years.

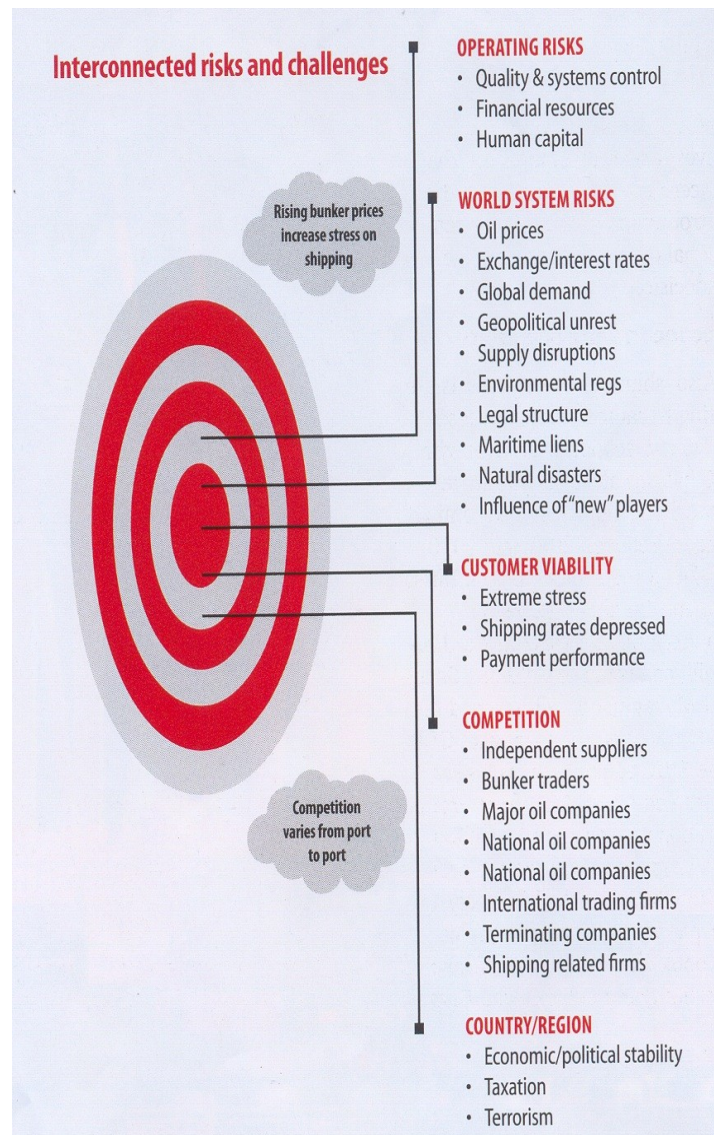
Larsen and Toubro (L&T) will invest **\$400 million** in its **shipbuilding unit** with an aim to gain market share for smaller vessels. L&T will select a deepwater yard this year and start building container ships weighing as much as 25,000 tonne in three years.

REQUIRED STEPS TO MAKE INDIA A GLOBAL SHIPPING & PORT CENTER

Port led development is an offshoot of a buoyant scenario around the existing port, with objectives like serving the port's core requirements and leveraging the region's maximum potential for infrastructure creation, wider hinterland and overall economic upliftment.

Categories of Port Led Development:

- Core infrastructure with the possible facilities
- Green field port can be developed to provide an alternative to major port to decongest or handle certain commodities of main port.
- Environment Friendly and cost effective method of Transportation
- Educational Institutions like maritime training and institutes can be created for learning and R&D activities.
- Logistics Infrastructure can have specialised facilities like grain silos, cold storage warehouses and Free trade warehousing zones.



AUTOMATION OF HANDLING IN PORTS

In India, modernisation of the mechanical ore handling plant at the Indian port of Mormugao has been suspended and work will be continue until the port trust has received backing from port workers, many of whom had previously raised serious objections to the work.

Also upgrading is the port of Gopalpur, where the Orissa government has announced a second phase of development work, which should be completed by March 2013.

COST OF TRANSPORTATION

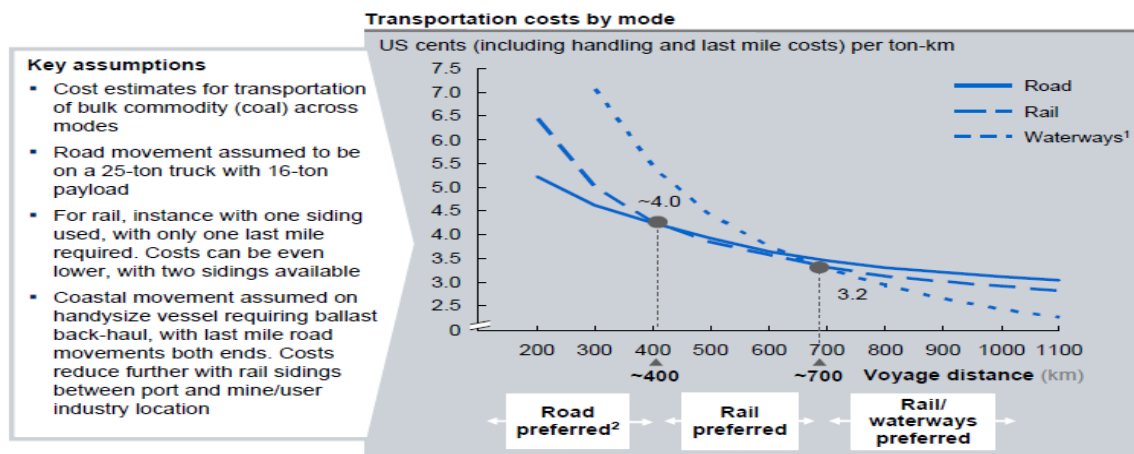
Waterways have many benefits. They are the cheapest and least-energy intensive mode of transport. The transportation costs (excluding last-mile costs) on waterways are around INR 0.5 per ton-km, well below the INR 0.9 per ton-km for rail and over INR 1.5 per ton-km for road. Further, increasing freight capacity on coastal corridors is easier than adding rail and road capacity.

Globally, coastal shipping has been leveraged quite effectively by countries like China, the US and Europe. The share of water-borne transport in domestic freight movements across countries is much higher than India’s 6 per cent. In China, 30 per cent of total domestic freight traffic travels on water (coastal shipping and inland waterways).

This can be attributed to China’s coastline and connectivity through an extensive inland waterway network through its major rivers. Major commodities such as coal, grain and oil from Northern China are transported through coastal shipping and inland waterways to the southern regions. Further, three major economic clusters (Bohai rim, Yangtze River delta, Pearl River delta) along the coastline from north to south boost the need for coastal shipping in China.

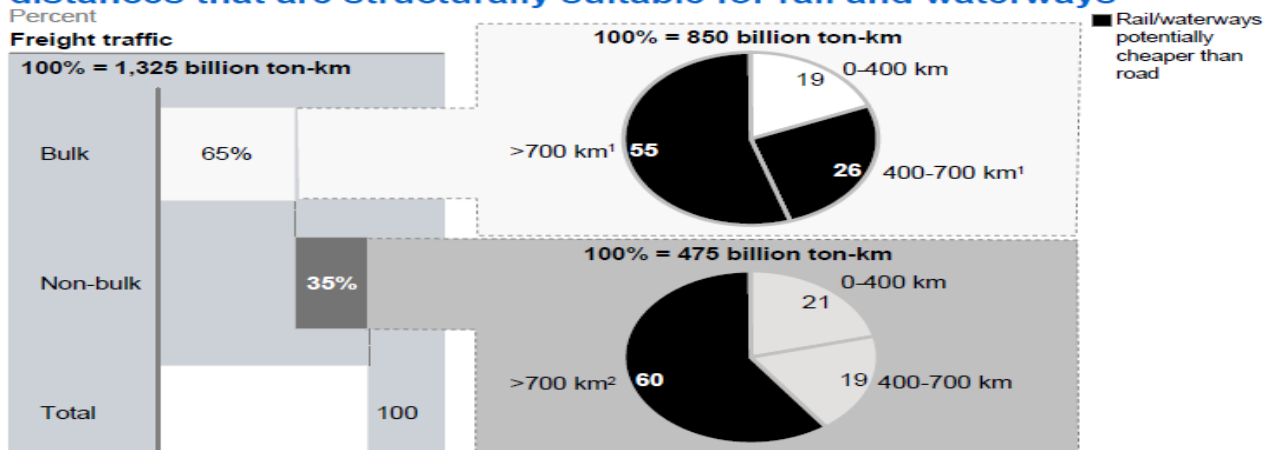
India has the opportunity to increase freight flows on coastal corridors along the West and East coast. Current penetration of coastal shipping is concentrated in favour of bulk goods like petroleum and coal. The low penetration in container traffic can be attributed to multiple factors outlined and implies an opportunity to transport container freight at lower costs.

Transportation costs on rail and waterways are lower than on roads for longer distances



¹ Refers to coastal shipping
² For large-volume movements (e.g., coal to power plants, it makes sense to use rail with two sidings for even shorter distance movements for reasons of truck availability)

Two-thirds of India’s freight travels over long and medium distances that are structurally suitable for rail and waterways



¹ Assuming rail siding available at origin, a short last mile move required on road of under 50 km to final destination
² At 700 km distance, true for heavy cargo such as tiles/stones/pig iron (28 tons in a container); assuming no rail siding available but short last mile moves on trucks of less than 50 km between rail terminals and points of origin/destination

A FEW AUXILLARY DEVELOPMENT AVENUES

1.EASE OF CUSTOMS

The customs policy as we know is very tedious, time consuming and not to mention costly. These factors invariably result in the drop in imports and hence low feasibility in the existence of modern port facilities and development activities.

2.REFRIGERATED PORTS

Due to the reasons mentioned above the existence of refrigerated ports is also still a cherished dream in the Indian shipping community. The transport of fish through reefers and on-land packing facilities has curtailed the possibilities of ports having packing and processing ability of fish which will not only be more economical but also a lot less time consuming.

CONCLUSION

As the above paper and facts stated suggest, Indian shipping is witnessing unprecedented growth both in term of cargo quantity and technological advancement to facilitate the cargo. The government and the private sector both are more than willing to invest in this sector not only for the betterment of the sector but also the economic advantage it will give to the forerunners in the not so far future. Hence it is vital that this sector is analysed and understood fully keeping in mind the kind of development it will have to undergo to keep up with the global standards. In this paper we have tried to quantify and give an idea of possible scenarios in the sector.

ACKNOWLEDGEMENT

We would like to thank our teacher and mentor Dr. B.V.R.RAO for guiding us through the paper research and the overall analysis of the current infrastructure and the requirements in the future for the ports and shipping in INDIA. We would also like to thank all my colleagues for being a support throughout. Last but not the least I would like to our college and our director Prof. S.C. Misra for his inspiration and advice.

REFERENCES

- 1.Logistics report by Mckinsey & co.
- 2.Ports and shipping infrastructure editions
- 3.www.Indiacore.com
- 4.Port and shipping news editions

TRANSFORMING INDIA!!!!!!

