WORKING GROUP ON PORTS AND SHIPPING

FOR

THE NATIONAL TRANSPORT DEVELOPMENT POLICY COMMITTEE

सत्यमेव जयते

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EXECUTIVE SUMMARY

Maritime Transport is the shipment of goods (cargo) and people by sea and other watreways. Port operations are necessary tool to enable maritime trade between trading partners. Ports represent a complex structure in a country's transportation system providing **ship harbour interface** services such as pilotage, dredging, provision of berths, maintenance of navigational channels, etc., **ship-port interface** in terms of loading and unloading cargoes and **port-land interface** in delivering cargo to and from the hinterland. They serve as the interface between maritime and inland transportation, play a significant role in the economic development of a country. Maritime transport is the backbone of global trade.

2. It is essential that ports provide efficient, adequate and competitive services. If they fail, ship-owners who find them too costly or too slow will go elsewhere. Hence if ports do not provide cost-effective services, imports will cost more for consumers and exports will not be competitive in world markets.

3. Draft limitation at Indian ports constrains access of large main line vessels. This entails transportation of goods from India to major export destinations to be transshipped at larger ports (Dubai, Singapore). Transshipment means additional handling of shipments, which is more expensive. Consequently shipping costs escalate which erodes cost advantage of Indian exports.

4. Ports should not be viewed in isolation but as being interdependent with the other modes of transports, road or/and rail for their existence and efficient performance. Lack of integrated or intermodal transportation constrains quick evacuation of cargo through other modes of transport if rail-road connectivity from the ports and hinterland is inadequate.

5. We must ensure that there is adequate, safe and seamless access to ports from land and at the same time ensure modern, navigable waterside access with channels that are deep and wide enough to handle today's modern vessels and marine highways to provide transportation options for moving cargo between ports.

6. These priorities should be included in a long term, national transportation plan that addresses freight mobility, congestion and productivity. Without such a plan and the necessary investment to support it, economy will be less competitive.

7. Shipping is necessary for the development of the national economy as well as to keep supply lines open for transportation of essential commodities during peacetime and emergencies such as war and famine. The existence of strong and viable national fleet serves as balancing factor in the freight market. The key issues facing Indian shipping sector are greater cargo support, cargo assurance through long term charter of vessels, tax regime which enables Indian shipping companies to compete globally, promotion of coastal shipping and equal treatment for Indian seafarers plying

on vessels in International Waters and Indian territorial waters.

8. Inland Water Transport is the most environment friendly mode with its excellent fuel efficiency and lower emission levels. Lack of development of IWT infrastructure has constrained full exploitation inland water transport mode. National Waterways come under the purview of the Central Government while rest of the waterways come in the domain of State Governments. The National Waterways carried 4.92 million tonnes of cargo in 2010-11. These have the potential to carry 18 times the present cargo by 2029-30. IWAI has taken up some projects in collaboration with private sector for movement of cargo on National Waterways. The challenges for inland water transport sector are integration of waterways with other modes of transportation to form an efficient multimodal transport network to achieve sustainable development of IWT sector; development of waterways in North Eastern (NE) region which has large potential/navigable stretches for IWT; Policy support for creation of floating infrastructure i.e Barges/ Inland Vessels is critical to attract private capital for development of IWT sector and Creation of adequate education and training facilities to help sector specific capacity building is necessary.

Cargo Traffic, Port Capacity, Investment requirements in the Port Sector

9. India has a coastline of 7517 km with 12 Major Ports and 199 notified Non-major Ports along the coastline and Island. Major Ports are the ports which are administered by the Union Government, while Non-major Ports are administered by the State Governments. Seaports in India moved more than 80 percent of the country's overseas cargo, and handled about 912 million tonnes of cargo in 2011-12. Out of this 61.4% is handled by Major Ports while remaining is handled by Non-major Ports.

10. During 2011-12 Major and Non-major ports in India accomplished a total cargo throughput of 911.7 million tonnes reflecting a modest increase of 3.0% over 2011-12 compared to a growth of 4.2 % in 2010-11. The growth in cargo handled at Major and Non-major ports in 2011-12 was 1.7% and 11.5% respectively compared to 1.6% and 9.1% achieved in 2010-11. The deceleration in overall growth in India's seaborne cargo traffic in 2011-12 reflects slowdown in global and domestic growth during the course of 2011-12.

11. The year 2011-12 was a challenging year for the Major Port Sector as it was buffeted by three exogenous shocks (a) growth in major industrial countries which are a major market for Indian merchandise trade decelerated from 3.2% in 2010 to 1.6% in 2011 and is projected to grow at mere 1.4% for 2012. Similarly, growth in world merchandise trade decelerated sharply from 14.3% in 2010 to 6.3% in 2011; (b) India's GDP growth slowed down from 8.4% in 2010-11 to 6.5% in 2011-12. Slowdown and decline was pronounced in case of India's GDP pertaining to manufacturing and mining sectors: while growth in manufacturing slowed from 7.6% in 2010-11 to 2.5% in 2011-12, growth in mining sector made a complete about turn from 5% in 2010-11 to -0.9% in 2011-12; (c) series of judicial interventions leading to ban/restrictions on iron ore exports which resulted in more than 30% decline in its export. Iron ore loadings at major ports at 60.69 MT

in 2011-12 were 27 MT lower compared with iron ore loadings 2010-11 leading to overall shortfall of 30.5 MT between the target and achievement for overall cargo traffic for 2011-12. These exogenous factors to a large extent reflect in sharp fall in iron ore loadings and deceleration in container traffic from 12.7% in 2010-11 to 5.4 % in 2011-12.

Major Ports

12. Cargo traffic at 560.1 million tonnes at India's 12 major ports during 2011-12 accounted for 61.4% of India's total sea borne cargo. Total cargo of 560.1 million tonnes comprises of cargo loaded, cargo unloaded and transhipped to the tune of 194.1 million tonnes, 341.6 million tonnes and 24.4 million tonnes respectively. The overall compound Annual rate of Growth (CAGR) of traffic at major ports during 1950-51 to 2011-12 has been 5.6 percent, whereas during the post-liberalisation period i.e. from 1991-92 to 2011-12, the CAGR was 6.6 percent. **The CAGR of traffic growth at major ports for the last 5 years was 3.8 percent.**

13. Commodity groupwise analysis of last 5 years of CAGR reveals that the **highest CAGR of 10.4% has been observed in container traffic, followed by 7.0% for Fertilizer and Fertilizer raw material** and 5.5% for the coal. As far as the cargo composition is concerned, there has been a significant change in the share of Iron Ore and container traffic during the past 5 years. The share of container traffic increased from 15.8% in 2006-07 to 21.5% in 2011-12 while the share of Iron Ore decreased from 17.4% in 2006-07 to 10.8% in 2011-12. During 2011-12, POL traffic maintained a dominant share of more than 32%, followed by Container traffic (21.5%), Other cargo (18.0%), Iron ore (10.8%), Coal (14.1%) and Fertilizer & FRM (3.6%).

Non – Major Ports

14. There are 176 non-major ports situated along the peninsular coast-line and sea-islands. The traffic is handled by only 61 Ports (including ports of Andaman & Nicobar Islands under the administrative control of Port Blair Port Trust).

15. Non-major ports in India collectively handled 351.51 million tonnes of traffic during the year 2011-12 as compared to 95.52 million tonnes of cargo handled in 2001-02. The CAGR growth in traffic during 2001-02 to 2011-12 achieved by Non-major ports was 13.9% compared with 6.9% achieved by Major ports in the country. The share of cargo traffic of Non-major ports in the total cargo traffic handled by all ports in India has increased steadily from 24.9% in 2001-02 to 38.6% in 2011-12. POL & its products (45.8%) was the single largest commodity handled at non major ports in 2011-12 and its share has ranged between 44% (in 2006-07) to 55 % (in 2001-02). It is observed that during last five years, the relative shares of commodities handled by the non major ports have not shown any pronounced shift. In 2011-12, the share of coal in the total traffic was 22.3% followed by Iron Ore (10.3%) and Building Material (3.2%).

Capacity at Major Ports

16. The total cargo handling capacity at the Major Ports exceeded the actual traffic handled for the first time in 2000-01 with little excess capacity in subsequent years. The capacity in the Major ports as on 31.03.2012 was 696.53 million tonnes against the traffic of 560.1 million tonnes with a capacity utilization of 80.4%. The capacity at Non-major ports as on 31.03.2012 is estimated at 445 million tonnes against a traffic of 351.5 million tonnes reflecting capacity utilization of the order 79%.

Projection of Cargo Traffic, Capacity and Investment upto 2031-32 in Port Sector

Cargo Traffic

17. Cargo traffic at Indian ports is affected in the short run by global economic and trade conditions and state of domestic economy. The sharp slowdown in the growth of world trade and in domestic growth in 2011-12 has impacted Cargo traffic at Indian ports. **The growth in cargo traffic handled by Major ports in the first quarter of 2012-13 was -5.5%.** Considering the weak global growth prospects and weakening of domestic growth dynamics, the cargo traffic at major ports is expected to grow at 3% in 2012-13 and thereafter at 6% for the remaining 4 years of the XIIth Plan. For Non-major ports the annual growth cargo traffic is assumed at 10%. Keeping in view the trends in the share of commodities in the Cargo traffic at Major ports and Non-major, the cargo traffic at Indian Major port and Non-major ports in maritime States is estimated to increase from 911.7 million tones in 2011-12 to 1315 million tones in 2016-17. Table 3**C** gives the Commodity-wise projected traffic of Major & Non-Major ports up to the end of XIIth Plan.

Table 3C : Projected Cargo Traffic at the end of XIIth Plan

Commodity	2016-17		
	Major Port	Non-major Port	Total
POL	218.5	246.6	465.1
Iron ore	65.6	58.7	124.3
Coal	116.5	146.8	263.3
Fert & FRM	22.6	20.5	43.1
Containers	167.5	47.0	214.5
Other cargo	137.7	67.5	205.2
Total	**728.4**	**587.0**	**1315.4**

Cargo Traffic Projections during 2017-18 to 2031-32

18. The cargo handled at Indian ports mainly comprise of POL, Iron ore, coal and General cargo (in containers or break bulk). General cargo traffic handled at ports is affected by the changes in the global economy and domestic manufacturing activity. The Cargo traffic for subsequent year's upto 2031-32 has been projected using expected growth rate for various commodity groups based

on perceptions of the user Industry and long term growth rate trends. Cargo traffic for the period 2017-18 to 2031-32 has been estimated using different growth rates across broad commodity groups; 4% for POL as long term availability of crude oil is likely to be tight resulting in high level of crude prices; Iron Ore export will need to be balanced keeping in view domestic consumption requirements of steel industry and environmental concerns, therefore, a modest growth of 2 % in cargo traffic of iron ore (mainly loadings) is expected; 5% for Fertiliser & FRM to meet domestic demand-supply mismatch, 8% for Coal to meet the requirement of Thermal generation and steel plants and; 7% each for Container and other Cargo due to increase in trade of manufactured goods.

19. The projected cargo traffic at the end of XIIth Plan (2016-17), XIIIth Plan (2021-22), XIVth Plan (2026-27) and in 2029-30 are given in Table 3**D**.

Table 3D: Commoditywise Cargo Traffic Projections (Major & Non-major Ports)

(Million tonnes)

Commodity Year	POL	Iron ore	F&FRM	Coal	Containers	Other cargo	Total
2016-17	465.1	124.3	263.3	43.126	214.5	205.1	1315.4
2021-22	565.8	137.2	386.9	50.0	315.2	287.8	1742.8
2026-27	688.4	151.5	568.4	58.0	463.1	403.6	2332.9
2031-32	837.6	167.2	835.2	67.2	680.4	566.1	3153.7

Capacity Required at Indian Ports during 2012-13 to 2031-32

Capacity Requirement at Indian Ports during 12th Plan (2012-13 to 2016-17)

20. The international practice for ports is to plan for cargo handling capacity of 30% more than the projected cargo traffic so that pre-berthing detention of ships on port account is minimised. The cargo handling capacity have to be planned separately for each commodity group as each of them require different configuration of facilities. The estimated capacity at the end of XIth Plan at all Major ports and Non-major Ports is estimated at 696.5 million tones and 445 million tonnes respectively against traffic at 560.1 million tonnes at Major ports and 351.6 million tonnes at Non-major ports respectively. The traffic at Major and Non-major ports is expected at 728.4 million tones and 587 million tonnes by the end of the XIIth. Keeping in view the projected traffic at Major & Minor ports, the capacity required by Major and Non-major ports at the end of 12th Plan is estimated at 1710 million tonnes.

21. Based on cargo traffic projections, commodity-wise total capacity requirement have been worked out from 2017-18 to 2031-32. Table-3**E** gives Commodity-wise capacity required at the end of XIIth Plan 2016-17), XIIIth Plan (2021-22), XIVth Plan (2026-27) and XVth Plan (2031-32) to handle projected traffic.

Table 3E: Commoditywise Cargo Capacity Projections (Major & Non-major Ports)							
							(Million tonnes)
Commodity Year	**POL**	**Iron ore**	**F&FRM**	**Coal**	**Conta-iners**	**Other cargo**	**Total**
2016-17	604.6	161.5	342.3	56.1	278.8	266.7	1710.0
2021-22	735.6	178.3	502.9	65.0	409.7	374.1	2265.6
2026-27	894.9	196.9	739.0	75.3	602.0	524.7	3032.8
2031-32	1088.8	217.4	1085.8	87.3	884.5	735.9	4099.8

Investment Required during 2012-13 to 2029-30 in Port Sector

22. In order to create capacity necessary to handle projected traffic in XIIth Plan, a number of port development projects have been identified by Major Ports and Maritime States to be taken up by the terminal year of the 12th five year plan (2016-17). Most of the projects/ schemes conceptualized for capacity augmentation are through PPP mode. Based on the plans of Major ports and maritime States, the investment required and pattern of financing for capacity addition of 250.4 million tones at Major Port and 318.1 million tonnes at Non-major ports during XIIth Plan is given in Table-3**F.**

Table 3F: Investment by Major and Non-major Ports during XIIth Plan				
				(Rs Crore)
	GBS	**IEBR**	**Private Sector**	**TOTAL**
Major Port				
Construction of Berth/Jetties	166.0	4203.7	9448.3	13818.0
Dredging	3303.2	3791.8	0.0	7095.0
Port equipment & Machinery	0.0	1022.9	558.4	1581.3
Rail-Road Connectivity	0.0	3442.6	5531.1	8973.7
Total (Major Port)	**3469.2**	**12461.0**	**15537.8**	**31468.0**
Non-major Port				
Construction of Berth/Jetties	0.0	812.7	20024.8	20837.5
Dredging	45.0	369.1	3227.0	3641.1
Port equipment & Machinery	11.3	540.1	3306.1	3857.6
Rail-Road Connectivity	777.9	286.8	2963.6	4028.3
Total(Non-major Port)	**834.2**	**2008.8**	**29521.5**	**32364.5**

ALL ports				
Construction of Berth/Jetties	166.0	5016.4	29473.1	34655.5
Dredging	3348.2	4160.9	3227.0	10736.1
Port equipment & Machinery	11.3	1563.0	3864.6	5438.9
Rail-Road Connectivity	777.9	3729.4	8494.7	13002.0
Total (All Ports)	**4303.4**	**14469.8**	**45059.3**	**63832.5**

23. For estimates of investments required beyond 12th Plan, considering the constraints in estimating investment required during 2017-18 to 2031-32 to create capacity at ports for handling the projected cargo, the Working Group has adopted the following methodology. The projected cargo for 2017-18 to 2031-32 has been estimated separately for different commodities (or groups). In order to project the investment required to create capacity at ports, it is pertinent to note that investment required to create one million tonne of capacity for a commodity-group varies from commodity to commodity. The investment required to create one million tonne of capacity in an existing port varies vastly from the investment required in a new port.

24. Tariff Authority for Major Ports (TAMP) decides upfront tariffs for ports based on capital cost to be incurred for creating capacity at a Major port. Based on upfront tariffs approved by TAMP for projects from 2010-11 onwards, the average capital cost to be incurred by Major Ports for handling one tonne of cargo in respect of different cargo commodity groups at 2010-11prices works out at Rs 52 crore for POL,Rs 63 crore for iron ore, Rs 51 crore for Fertiliser & Fertiliser Raw material, Rs 55 crore for coal, Rs 67 crore for Containers and Rs 56 crore for Other general cargo. These cost have been inflated at 8% to arrive at 2011-12 prices which have then been used to estimate the investment required by Major Ports and Non-Major ports for creating the projected port capacity. In addition to direct investment for creating capacity, ports also require investment for creating other facilities like deepening and maintaining of channels, rail and road connectivity and other infrastructure at ports. Plan-wise investment required for creative capacity during XIIIrd, XIVth and XVth Plan at Table-3**G**.

Table 3G : Projected Investments (Rs Crore)

(Rs Crore)

Year	GBS	IEBR	Private Sector	TOTAL
2012-13 to 2016-17	4303	14470	45059	63833
2017-18 to 2021-22	4248	14284	44481	63013
2022-23 to 2026-27	5879	19767	61554	87200
2027-28 to 2031-32	8193	27547	85782	121522
Total	22623	76068	236877	335568

Policy Issues/Policy/regulations for the Port Sector

25. The issues identified are**:**

(i) The Major ports to continue to work towards implementing 'landlord port' concept duly limiting their role to maintenance of channels and basic infrastructure leaving the development operation management of terminal and cargo handling facilities to the private sector. Total realisation of this concept is expected by 2020.

(ii) Public Private Partnerships will be the preferred mode for the development of port terminals and other commercially viable activities in the Major Ports.

(iii) The need for a Port Regulator for monitoring and regulating the service levels, technical & performance standards.

(iv) The environmental clearance process be reviewed as one of the major factors for delay in the fructification of projects is the long environmental clearance mechanism procedure.

(v) Protection of environment is an indispensable factor for sustainable economic growth. Environmental issues including the handling of hazardous and noxious substances in a port, prevention of air, water and soil pollution in ports, treatment of ballast water etc., need to be addressed and tackled. The port industry in general is faced with sustainability issues – compliance to international and national regulations vis-à-vis demands for bigger port capacity and increased productivity without compromising environmental quality. Without environmental regulation, it would be difficult to implement greener practices, as these may put operators at a competitive disadvantage. Other related issues are availability of incentives to encourage green practices, cost and availability of clean fuel, the need to do more research on green technologies, use of shoreside power, training programmes for such industry and designating emission control areas.

(vi) Financial support for dredging is necessary for reducing the port charges.

(viii) There is a need to develop at least 4 hub ports to receive the 13,500+ TEU containerships.

(ix) Maritime projects are specialized in nature and they require a specialized scrutiny and appraisal for obtaining the finances. There is a need for a specialized Maritime Finance Corporation with the equity of ports and financial institutions to fund the Port projects.

(x) The Governments, both Central and State should transform the legislative frame-work in tune with the current requirements. Necessary amendments to the Major Ports Act, 1963, Indian Ports Act, 1908 and Maritime Board Acts of respective State Governments need to be carried out.

Inter-port and Intra-port Competiton:-

26. The policy approach of the Government has been to mitigate monopoly domination by a single Operator. The policy states that if there is only one private terminal/berth operator in a port for a specific cargo, the operator of that berth or his associates shall not be allowed to bid for the next terminal/berth for handling the same cargo in the same port. Earlier, when the Jawaharlal Nehru Port Trust (JNPT) was to award third terminal, existing P&O, Australia was debarred from bidding for the third Terminal. Aggrieved by this decision P&O, Australia went up to the level of Supreme Court but lost. Similarly, PSA was not allowed to bid for the second Terminal in Tuticorin and DP World was barred from bidding for the second container terminal in Chennai port. Private terminal operators have expressed their reservations on this policy. First, given a situation where demand exceeds the supply as far as container handling capacity is concerned is it desirable to bar incumbent terminal operators from bidding in the same port. Second, there is an independent Tariff setting Authority for Ports which fixes tariffs subject to a predetermined cap on return on investment. Third, competition issues should better be left for the consideration of the Competition Commission which was set up in India under the provisions of the Competition Act, 2002.

Rail Road Connectivity with Ports

27. Ports are no longer isolated entities and today are nodes for interchange amongst various modes of transport and a vital element in global logistics chain. As India is opening up its economy, the share of trade is going up steadily and the expectation of port use will be in terms of time, cost and quality. Ultimately the commodity from the source of production has to reach the consumer in the shortest possible time and in the most cost effective way. It is the production driven need for an integrated global logistics chain that has led to inter-modalism. As such today's modern port is a dynamic node in the international production and distribution network. Port connectivity is essentially dynamic as developments take place continuously in the industrial activity in the hinterland, market forces and technology improvements. Therefore, there must be a mechanism of periodical review of the overall performance followed by an exercise of comparing with the best in the world. The growth of port traffic is expected to be high in coal and containers.

28. To ensure adequate connectivity to the ports following measures are suggested:

i. Every port must have a two-lane road as the minimum connectivity.
ii. Where railable cargo is handled, the requirement is: A two lane road and a single line rail connection up to a level of 5 million tonnes per annum. It should be improved to 'double line' rail connectivity and four-lane road connectivity when the traffic handled crosses this threshold of 5 Million Tonnes per annum.
iii. Connectivity within the port system should also receive more attention than at present.

iv. The Railways must finalize their revised policy for attracting private investment as quickly as possible. PPP investments and state govt. participation are to be facilitated.

v. The present situation in respect of connectivity is grossly inadequate for non-major ports. Massive investments are needed.

vi. Quantification of connectivity through an "index" should be done and inter-se prioritization of investments should be guided by it.

vii. Allocation of certain ports for predominantly handling certain commodities should be done so as to optimize hinterland-port linkages and flows. CFS/ ICD nodes should be developed as a part of integrated plan. DFCs should be well connected through feeder routes.

viii. Inland Water Transport potential should be exploited better.

Water Transport Statistics

29. Timely availability of Water Transport statistics comprising of Port Statistics, Port Statistics, Shipping, Ship Building and Ship Repair Statistics and Inland Water Transport Statistics, is vital for monitoring of trends in the economy, performance of the water Transport sector and policy formulation. Water Transport Statistics includes the following:

Port Statistics

30. Over the years the type of cargo being handled has undergone structural change, with the container traffic gaining in importance. Last one and half decade has seen growing participation of the private sector in port sector leading to change in the operating environment. In order to understand the changes, it was felt that new parameters and indicators for monitoring policy effects need to be identified for data collection. The Ministry of Shipping had set up a **Working Group for Strengthening of Major Port Statistics** In May 2009**.** The Working Group has submitted its report in March 2011. Main recommendations/suggestions of the working Group are:

(i) The concept of cargo handled and Turn Round Time and its various components have been rationalised to reflect true picture and to enable inter – port comparisons.

(ii) For uniform collection and presentation of Major Port statistics, certain changes in procedures/methods have been suggested.

(iii) To measure the dynamics of the port service sector, short term indicators are required. The three port service indices, namely Index of Service Production (ISP), Consumer Service Prices Index (CSPI) and Producers Price Index(PPI) have been recommended to be compiled annually.

(iv) Measures for improving quality of Major ports have been recommended.

31. **Non-major Ports** are compiling Cargo traffic data. Periodicity of cargo traffic data available for policy and planning purpose from all Maritime States/UTs is at half yearly interval i.e. for the period ending 30th September and 31st March. The data is available for important commodities only. Some of the States take a long time in compilation of detailed cargo traffic and other non-major port data for the publication 'Basic Port Statistics'. This inevitably delays compilation of all India aggregates and subsequent dissemination to Public.

32. In order to comprehensively monitor the trend in cargo handled by Indian ports, it is imperative that all Maritime States/UTs put in place a mechanism to compile and disseminate monthly cargo traffic data, particularly for non-major ports handling more than 5 million Tonnes per annum.

33. The following data gaps in Port's statistics exist:

(i) Data on countrywise break-up of Origin and destination-wise of cargo is frequently asked by researchers. Shipping lines/companies generally provide information on the port of country from where the cargo is loaded or to where the cargo is to be discharged and not the actual country from where the cargo originated or is destined to.

(ii) Container cargo is fastest growing traffic at Major ports. However, the commoditywise data handled in containers is not being maintained by major ports.

34. Ports are in the process of implementing Port Community System (PCS) which is intended to integrate the electronic flow of trade related document/information and function as the centralized hub for the ports of India and other stakeholders like Shipping Lines/Agents, Surveyors, Stevedores, Banks, Container Freight Stations, Customs House agents, Importers, Exporters, Railways/CONCOR, Government regulatory agencies, etc. for exchanging electronic messages in secure manner. One of the objectives of the PCS is data repository for research and analysis. With the implementation of PCS, the it may be possible to fulfil the above data gaps.

Shipping Statistics

35. The National Statistical Commission set up by Government of India in its report in 2000 had identified following important data gaps.

(i) Financial performance indicators of private shipping companies.
(ii) Operational indicators (voyages, cargo, capacity or space utilization).
(iii) Freight rates for selected Indian Import and export commodities for all shipping companies.
(iv) Safety Statistics.
(v) Environment pollution caused by shipping Industry

36. The National Statistical Commission had recommended that a mechanism should be evolved by the Ministry of Shipping to collect data from individual shipping companies. TRW in collaboration with Directorate General of Shipping and Indian National Ship Owners Association (INSA) may explore ways to obtain and publish data not only on Financial/Operational Indicators, Safety statistics and environmental pollution caused by shipping industry of at least listed companies. Freight rates are in the nature of commercial information which varies from day to day and is acquired by shippers and is subject to negotiation. It may not be easy for a non user/non shipper like TRW to access accurate information.

Statistics of India's Ship- Building & Ship Repairing Industry

37. Ship Building Industry is a technology, skill and material intensive assembly operation. It draws upon a large number of services and utilities. The end product is a high value floating asset. The Working Group suggests the following to overcome data short comings in ship building and ship repair activities.

(i) Ship order book data presently published may be further classified into Indigenous and Export orders.

(ii) Complete coverage of private sector companies engaged ship building and repair activities may be ensured. This would require a mechanism to regularly update the list of private ship builders and ship repair companies in India.

Inland Water Transport Statistics

38. Inland Water Transport (IWT) is a cost effective fuel efficient and environment friendly mode, specially for transportation of bulk Cargo, hazardous goods so vital for industrial development. Apart from the non-availability of timely data on inland water statistics, particularly from states, there are data gaps in IWT statistics :

(i) IWAI is providing Cargo statistics for vessels which are registered and are availing the facilities of IWAI on National Waterways. There are several small unregistered vessels/ boats (country crafts) which carry cargo and do not avail facilities of IWAI infrastructure. The cargo carried by those vessels/boats is not at all being captured. There is a need to carry out periodic survey (may be once in five years) to assess the Cargo Carried by such vessels on National Waterways.

(ii) Many of the State Governments are unable to maintain the data/information on Inland Water Transport due to lack of scheduled/systematic records on Freight/Passenger operations on their waterways. Consequently, the data on IWT at all India level lacks full coverage.

(iii) The data also need to be collected on number of people trained by States to operate mechanised vessels.

39. The Working Group suggests that states which have inland water transport activity and are not providing data should put in place an institutional mechanism to regularly collect data on IWT activities at state level.

Improving Quality of Port, Shipping and Inland Water Transport Statistics

40. The Working Group recommends the following to improve quality of Water Transport Statistics.

(i) Periodic review of Water Transport statistics is required to assess the system and identify the possible changes required for meeting the user needs. It is suggested that such review of various sectors of Water Transport Statistics be undertaken once in five years

(ii) At present, no system for training and sharing of experiences in respect of Water Transport statistics exist. Training programme/workshops for officials/staff involved in compiling Water Transport statistics, particularly Port statistics may be organized. The workshops should cover statistical concepts, definitions and issues of compilation, processing and Total Quality Management.

(iii) The annual publication should be brought out in the year following end of the calendar/financial year. Bi-annual publication should be brought out within the three months i.e. in June for the period ending 31st March and December for the period ending September.

(iv) TRW may provide the metadata for water transport statistics in the form of a manual on the website of Ministry of Shipping.

(v) All the regular publications on Ports, Shipping and Inland Waterways of TRW should be put on the website of Ministry of Shipping.

(vi) Concurrent audit of statistical activities is necessary for early detection of errors and mistakes during the progress of work, and their rectification in time is essentially an internal activity of the primary data compiling agency. It is suggested that assessment of quality of the data produced by the primary source agencies may be carried out through statistical audit by officers authorized by the Ministry of Shipping.

IT Investment & Interface

41. Transport system comprises of a number of distinct modes and services which are an integral part of supply chain. It is essential to have online information facilities on the various links in the supply chain. Implementation of IT is of vital importance.Changes in the port industry are underway because of implementation of Port Community System at Indian Ports. Similarly, change in the shipping industry is also underway. Leading carriers, consolidators, freight forwarders, and agents around the globe have introduced electronic commerce to serve their customers better.

42. Despite the huge size of the country, the import and export flows are still modest, when compared with other countries in East Asia. This is reflected especially in India's container throughput, where volumes are only a fraction of the Chinese container exports and imports. Also port development is much smaller and where Chinese ports are now the worlds leading ports (with the majority of the largest container ports being Chinese), the Indian ports are still relatively small ports.

43. Logistics costs as a percentage of Gross Domestic Product (GDP) range from around 9 per cent in the United States of America (USA) to 11–12 per cent in France and the United Kingdom and 10–15 per cent in China, India, Japan, and Singapore. The logistics sector in India is very fragmented. Only in some sectors, e.g. in the automotive industry, the concept of outsourcing and chain control is fully

44. Many Companies/Organization in logistics industry have significantly changed the way they do business by implementing ERP models, Port Community System (PCS). However parts of the transaction in the Maritime Community are still paper based. Therefore, digitalization process, which normally should lead to benefits for the users in terms of the time and cost advantages, has not been completed in logistics industry in India

45. The W.G. noted that only few Non-major ports have shown interest in the implementation of Port Community System. It is also observed that most of the small users do not have internal computer applications. Therefore, they are using user interface of PCS to do data entry for submission of documents instead of uploading messages from internal application system. The W.G. suggests that Government of India may take initiative to develop such module and provide to the users at nominal cost.

46. There is urgent need for implementation of suitable IT solution for:

(i) Management of intermodal cargo transfer to avoid cargo traffic bottlenecks, increased waiting time and lost efficiency;
(ii) Management of Multimodal transit network of Ports which may include cargo, trucks, Trains and coastal ships;
(iii) Automation of trucker movement around Ports with the help of GPS/GIS and RFID tag technology;
(iv) Automation of Port Gate for free flow traffic;
(v) Exchange of Position of Ship in sea as provided by LRIT shall be implemented for all the Port and Shipping fraternity;
(vi) Digital signature should be approved and introduced as soon as possible so that a complete paperless handling of documentation and payment flow is possible and required improvements in lead time and logistics cost advantages can be realized;
(vii) National Payment Gateway including all banks so that users can make ONLINE

payment from any banks and branch;

(viii) Developing a **single window electronic platform** for maritime stakeholders to have a common interface. It is suggested that keeping Port Community System (PCS) as a base, other components may be integrated using Service Oriented Architecture (SOA).

(ix) Each port should undertake Enterprise Resource Planning (ERP) solutions which would cover all functional areas including port operation. The functional areas where ERP solutions are not available off the shelf, the solutions should be developed and integrated with ERP solutions.

PPP Framework & Benchmarking

47. Constrained by capacity, the challenge facing the country's ports are:-

(i) Efficiency using Public Private Partnership to add new port capacity: and
(ii) Efficiency using port capacities

48. To speed up port project implementation**:** six initiatives have been identified for the government, regulators and nodal agencies to facilitate the implementation of PPP port projects in India. These emerged through discussions with private players, public sector units, and government officials across nodal agencies and regulatory bodies. The effective implementation of PPP port projects can add the much-needed capacity to India's ports. The six actionable recommendations enumerated below can resolve the bottlenecks that currently slow down project implementation.

(i) Establishing a high-power group to monitor and de-bottleneck ports projects

Such a group can add transparency and expedite decisions that enable progress. Its scope should cover a small number of larger projects. The group can be a part of the Committee on Infrastructure.. The group should:

a) Monitor project portfolio and port trust performance on at least three key metrics: on-time award; actual construction progress against planned milestones; and within-budget completion
b) Consolidate performance data on a quarterly basis and make it publicly available, highlighting areas prone to delays and over-runs
c) Selectively involve providers of large projects to understand bottlenecks and collaborate on solutions for growing delays and over-runs
d) Escalate inter-ministerial bottlenecks that are impeding important projects (pre- or post-tendering) to relevant authorities, and push for decisions. For instance, the group can selectively convene ministers and bureaucrats from concerned areas, creating an empowered group to expedite the resolution of bottlenecks

(ii) **Amending the MCA to balance the risk sharing:**

a) Project cost should be limited to minimum of approved cost, lenders' cost and actual cost:

b) Due debt should exclude the principal that has fallen due before the termination notice:

c) Sponsors to hold at least 51 per cent stake in the special purpose vehicle for two years after commercial operation date (COD); lead member to hold 26 per cent stake in SPV at all times; and each member evaluated for pre-qualification purposes to hold 26 per cent stake for 2 years after COD.

d) Interest linkage to be changed to 10 year G-Sec from SBI's prime lending rate:

e) Some other MCA aspects need to be reconsidered in the light of feedback from developers and financiers. For example, the adequacy of the financial closure window, sufficiency of the "conditions precedent" clause, fairness of basing the terminal payment on book value, enforceability of charge on assets given the immobile nature of assets and the effectiveness of port monopoly norms.

(iii) Modifying the existing economic regulatory framework to achieve uniform regime and use tariff leverage to promote efficiency in operation: There is a need to introduce a uniform economic regulatory framework covering the entire port sector. A two-tier regulatory mechanism, as prevalent in the power sector, may be an ideal choice.

a) The scope of regulation should cover not only tariff setting, as at present, but also setting, monitoring and regulating service levels and performance standards. The regulators may also be entrusted with the responsibility of dispute resolution, as appropriate.
b) A detailed study should be commissioned to assess the extent of competition prevailing in the market for provision of port services in different regions for different types of commodities. If such a study reveals the existence of a perfect market condition, tariff fixation may be left to market forces with the regulatory intervention to be limited to adjudicating disputes, if any, arising between the service providers and port users.
c) Tariff fixation should be based on the normative approach relying upon the standard capacity created and efficient cost of operating such facilities. The tariff guidelines of 2008 issued by the government for setting upfront tariff for PPP projects follow such a model and may, therefore, continue unaltered. However, retaining the upfront tariff unaltered for the whole project period needs to be re-examined. The guidelines may be amended to provide for periodic review of tariff, say once in five years, based on updated performance norms and capital costs.
d) The tariff guidelines of 2005, applicable to the major port trusts and private terminals that came into existence prior to 2008, require a thorough revision. Tariff fixing in these cases may also follow a normative approach which will act as an incentive to improve operational efficiency.

e) The operators may be allowed to retain the benefit of efficiency gain, provided tariff is set based on pre-determined standards instead of relying upon their own past performance and their projections for the future.
f) Regulatory approvals may be granted in a time-bound manner and towards this end, the regulatory process should be streamlined including adequately strengthening administrative and statutory aspects of regulatory organisations.

(iv) Ensuring at least 90 per cent of land is acquired before tendering: Pre-conditions for tendering PPP and EP&C projects can include acquiring 80 to 90 per cent land, including the tracts indispensable for normal progress of construction work. The land should be considered "unencumbered land" only when it is free from any dwellings or other physical encumbrance. Contractual mechanisms (such as a penalty clause) should ensure the relevant port trust's continual commitment to land acquisition even after the award. The penalty calculation should ideally be unambiguous and similar to that of liquidated damages (a fixed quantum of penalty for each day of delay). Penalties should adequately cover typical extension costs, and could be capped in a similar way as liquidated damages payable by the provider.

(v) Selecting design and engineering consultants based on quality-cum-cost based assessment: Paid consultants help to prepare most DPRs and can impact the time and cost of project execution. It is important to select technical consultants using a quality-cum-cost based assessment (QCBA) instead of the traditional L1 based (lowest cost) approach. The quality score should count for at least 50 to 80 per cent of overall assessment (as in Canada and the USA). Evaluators can rate the consultant through feedback from the respective port trusts about his or her performance on previous and ongoing projects. The port trusts, in turn can assess performance in a standard manner across projects using a set of standard guidelines with objective scoring parameters. For instance, evaluators can look at the magnitude of design changes during project execution and the reasons for the same.

(vi) Launching a construction-focused vocational training programme: The government must tackle the manpower shortage by creating additional training capacity to generate another 2 million to 3 million skilled workers per year by 2017. To build such scale, private capital will need to participate through commercially viable PPP models. The government could contribute partial equity and real estate for these projects to enhance their viability. The government should also ensure the commitment of the construction industry to five distinct areas:

Bench marking of Productivity

49. Optimising the vessel handling process end-to-end can reduce the port stay time of a vessel by up to 40 per cent. This can be achieved by:-

(i) Improving the port planning process: Better planning, coordination and communication ahead of the vessel's arrival in a port can help save 5 to 20 per cent on total port stay time. The two most critical aspects in the planning process are that: (a) The terminal operator evenly distributes cranes alongside the vessel so that they all finish around the same time and; (b) The shipping line allows for a more flexible stowage plan on board preventing unnecessary moves and downtime

(ii) Optimising the steaming and berthing process: Optimising this process for container ships can save 5 to 15 per cent of total port stay time. The most important levers in this process are:

a. Orchestrating the arrival of the pilot at the waiting station to limit unnecessary waiting time
b. Levelling the schedule to allow vessels to arrive at non-peak times
c. Optimising the arrival and departure process by executing certain activities in parallel instead of in sequence
d. The local port authority controls the arrival time of the pilot, but the shipping lines can control the other two levers.

(iii) Facilitating crane loading/unloading: **Efficient crane loading and unloading can cut port stay times by 10 to 15%.** The container terminal operator has complete control over these levers [(a) to (d)]. But if the operator and the shipping company don't align their incentives, it becomes harder to notify and implement these levers. This requires:

a) Creating faster availability of cranes once operations are ready to start
b) Deploying the right type of cranes and drivers at the correct bays of the vessel to ensure highest productivity levels
c) Making abundant trucks (or other equipment like straddle carriers) available at the quay crane to transport the containers to the yard, thus minimising crane waiting time
d) Optimising the shift-change process (hot seat change) so that new driver seat is already installed before shift change takes place

(iv) Streamlining yard operations: Better yard layout and production process (storage and retrieval of boxes) can save 5 to 10 per cent in existing timelines. This involves:

a) Improving stacking logic of fast moving container flows (large vessel bays) versus slower moving flows (Exhibit 2)
b) Optimising stacking logic to limit the distance a crane must cover to retrieve a container

(v) Easing gate operations: This doesn't directly create any savings potential for shipping lines or terminal operators, but it reduces the dwell time of the cargo for the shipper and limits the duration for which shippers need to hire the truck driver. It is estimated that a maximum of 5 per cent savings if the port focuses on: (a)Avoiding non–value added activities at the gate; (b)

Arranging better arrival/departure pattern of incoming and outgoing trucks and containers to smooth peak loads

Shipping

50. Shipping is the lifeline of a nation, necessary for the development of the national economy as well as to keep supply lines open for transportation of essential commodities during peacetime and emergencies such as war and famine.

51. India has a fleet strength of 1071 vessels as on 31st March 2011 with Gross Tonnage (GT) of 10.45 million. Out of these 1071 vessels 722 vessels (67%) with 1.02 million GT (9.8%) were engaged in coastal trade and remaining 349 vessels with 9.43 million GT were deployed for overseas trade. India is ranked 16th in the world in terms of Gross Tonnage under its flag. Indian compounded annual growth rate (CAGR) in shipping as per national flag registrations from 1980 to 2010 at 1.4% has been much lower compared to growth in tonnage at global level (2.5%) and for Asia (5.9%). The age profile of Indian vessel is that over 40% of the fleet is above 20 years of age.

52. Around 95% by volume (68% by value) of India's EXIM trade moves by sea. The average age of Indian fleet is around 18 years, it requires a major fleet replacement programme over the next 5 years. The overall share of Indian ships in the carriage of the country's overseas seaborne trade has been declining over the years. From about 40% in the late 80s, it is currently around 8% which is a matter of great concern, as it entails heavy outgo of foreign exchange in terms of freight bill that goes to foreign companies and India stands to lose not only the foreign exchange on the freight but also the multiplier effect that would accrue to the economy.

53. Besides the economic impact the role of Indian shipping in the national security, its role energy security is vital. The existence of strong and viable national fleet serves as balancing factor in the freight market. The key issues facing Indian shipping sector are:

i. Need for greater cargo support policy
ii. Cargo assurance for long term Charters.
iii. Deemed export status for shipping companies providing maritime transport services to consumers outside India and earning foreign exchange as freight.
iv. Exemption of Services tax on specified services to make the services price competitive.
v. Inequity between the service tax abatement for road/rail transportation and coastal transportation
vi. Levy of Minimum Alternate Tax (MAT) on profit/loss of sale of vessels.
vii. Need for promotion of coastal shipping.
viii. Unequal treatment for Indian seafarers plying on vessels in International Waters and Indian territorial waters.

54. The key recommendations of the Working Group to address the above issues are:

i) To retain and consolidate existing tonnage from flagging out to more attractive registers through greater cargo support, 1/3rd portion of the POL and dry bulk cargoes of EXIM trade of India, should be reserved for Indian Ships and should be linked as condition for availing benefits under the export schemes of the Government of India. This will assure cargo availability for Indian ships and act as a catalyst to boost the growth of Indian fleet.

ii) Indian shipping companies exporting maritime transportation services to consumers out of India and are earning valuable foreign exchange as freight. The Indian shipping industry is competing against intense international competition despite the comparatively high taxation regime in the country and other constraints put on the Indian shipping industry. According "**deemed export status**" to Indian shipping services and encourage the maritime transport service providers in building international competitiveness. Consequently, all inputs in terms of machinery, stores, spares and other related equipments used for the purposes of effectively operating an Indian flag vessel providing such an International maritime transportation service should qualify for a similar deemed export status and consequently be made free of local duties and taxes. Policy be suitably modified to grant deemed export status to "maritime transportation services" provided by Indian shipping companies from India.

iii) Make investment in Shipping at least as profitable as any other service industry by offering a conducive tax regime encompassing both direct and indirect taxes;

(a) **Service Tax:** Exporters presently get refund of service tax paid by them on input services used for exports. Government has issued a Notification providing refund of service tax paid by exporters on four taxable services (services offered to exporters by major ports, minor ports, road transport services provided by goods transport agency from inland container depot (ICD) to port of export and transport of export of goods in containers by rail from ICD to port of export) would now qualify for service tax refund. In many of the maritime countries the shipping industry is not subject to service tax either domestically or internationally. In the European Union, United Kingdom, Ireland, Singapore and Australia, the services availed of by shipping companies are either exempt from service tax or zero rated. **The ambit service tax exemption needs to be expanded to cover all marine services rendered in India and utilized by exporters. This would need list of such services on a verifiable basis to evaluate linkage of services with goods exported. Such shipping/marine services which facilitate exports and generate foreign exchange earnings could be exempted or zero rated. This will make such services price competitive.**

(b) **Seafarer's Taxation-Unequal treatment:** Indian seafarers employed on foreign vessels or Indian vessels which ply outside Indian territorial waters for182 days or more in a year are entitled to non resident status and pay no taxes. This does not apply to officers and seafarers on coastal ships. Also Indian and foreign seafarers working in Indian territorial waters for 182days or more are effectively Indian tax residents and are liable to pay tax on income. It may be noted that certain countries in Asia (Malaysia, Philippines, Singapore, and Thailand) have exempted income of their seafarers from personal taxation. In some European countries, ship-owners are given the right to withhold a certain percentage of personal income tax and social security payment of seafarers as an incentive to hire European seafarers by offsetting part of the high wage level in their country. Labour is a factor of production and seafarers by offsetting part of the high wage level in their country. Labour is a factor of production and seafarers income could be subject to a lower fixed/flat rate of tax which could be levied on all Indian seafarers irrespective of their residential status (i.e. place of work within or outside Indian territorial waters) and/or flag of ship they work for: a higher exemption up to a certain level of income could be given for tax purposes. Such a tax will reduce the attraction of foreign flag and may also help coastal shipping which find it difficult to engage and retain Indian seafarers under the existing manning laws.

(c) **Rationalising the Fiscal Regime:** Indian shipping, as against its foreign counterparts, is currently subjected to a variety of taxes numbering about 12 , some of them introduced in the year after relief was given through the tonnage tax, which affect the profitability of Shipping companies vis-a-vis fleets under foreign flags. Thus there is a strong case for rationalization of the taxation regime for the Indian shipping industry so as to bring down the effective tax rate to the rate payable by the industry when tonnage tax was fixed, at a level that will enable shipping companies to compete globally on a level playing field and also enable them to raise funds for acquisition of further tonnage. Tonnage tax itself needs to be re-examined as to how it can be made attractive to new investors, so as to widen the base of the shipping industry in the country. At present, there are only 46 companies who have subscribed to the tonnage tax regime.

It may be noted that certain countries in Asia (Malaysia, Phillipines, Singapore, and Thailand) have exempted income of their seafarers from personal taxation. In some European countries, ship-owners are given the right to withhold a certain percentage of personal income tax and social security payment of seafarers as an incentive to hire European seafarers by offsetting part of the high wage level in their country. Labour is a factor of production and seafarers income could be subject to a lower fixed/ flat rate of tax which could be levied on all Indian seafarers irrespective of their residential status (i.e. place of work within or outside Indian territorial waters) and/or flag of ship they work for or; a higher exemption up to a certain level of income could be given for tax purposes. Such a tax will reduce the attraction of foreign flag and may also help coastal shipping which find it difficult to engage and retain Indian seafarers under the existing manning laws.

(d) **Minimum Alternate Tax (MAT) on Profit/Loss on Sale of Vessels**

In India, profit/loss on sale of vessels is not covered under the tonnage tax regime. Therefore, the tonnage tax company has to pay minimum alternate tax/capital gains tax on such income. Minimum Alternate tax (MAT) @ 11.22% is payable on book profits in case the taxable income (i.e. other than tonnage income) of the company is less than 10% of the book profits. The profit/loss on sale of vessel is credited to the profit and loss account and would be included in the book profits of the qualifyingshipping company on which MAT would be applicable. In United Kingdom, Singapore, Ireland and Netherlands profit/loss on sale of vessels is covered under the tonnage tax regime. Thus, in the above jurisdictions the gain on sale of vessels will not be taxed under the normal corporate taxation rules. Given the need to augment the fleet capacity of the Indian Shipping it is suggested either to (a) to include surplus resulting from sale of vessels should be covered within the scope of tonnage tax regime or (b) exempt sale proceeds from tax if used to purchase a replacement vessel within a certain period of time.

(iv) Cargo Assurance through Long Term Charters: Long term charters by PSUs for critical energy cargoes of crude oil, petroleum products and gas should be negotiated and concluded exclusively with Indian ship-owners and the economy at large providing stability in freight costs and lowering input costs. Long term charters will assist ship-owners to raise finanace to augment the tonnage under the Indian flag and replace the aging Indian fleet. As is known, uninterrupted transport and supply of oil, a major source of energy, is very vital to a country's economy. Internationally, Japan and Korea have developed strong LNG fleet on the basis of long term contracts.

Recommendations for Promoting Coastal Shipping:

55. Coastal cargo accounts for only 18% of the total cargo handled at Indian Ports. There is need for boosting coastal trade in the country. The Working Group has recommended the following:-

(i) **Infrastructure**

a) Set up more minor ports along the coast, at least one port at a distance of every100 kms
b) Setting up dedicated berths for coastal ships;
c) Promotion of Ro-Ro jetties;
d) Promoting repairing jetties;
e) LNG supply facilities;
f) Setup dedicated warehouses for coastal cargoes;
g) Setup rail and road connectivity at the ports to the nearest rail heads;
h) Set up adequate ship repair facility and dry-docks along the Indian coast for catering to the growth of coastal shipping;
i) Deepening of sea channels at minor ports;

(ii) **Subsidies:** Implement an aggressive shipbuilding subsidy with focus on coastal vessels, tugs, OSVs etc. In additional following measures may be undertaken: (a) remove the lower limit of 80 metre on ship building: (b) include subsidy for LNG use facility both on retrofitting basis for existing ships and new ships and (c) subsidy for RO-RO jetties, repair jetties and a higher level of subsidy for a pair of jetties dedicated to coastal shipping.

(iv) **Indirect Tax Taxes/Exemption:** (a)Increase in abatement of service tax for coastal transportation from 25% to 75% i.e. at par with transportation of goods by rail/road. (b) Confer 'Declard Goods' status to bunkers being consumed by Coastal/Inland vessels.

(iv) **Fiscal Incentives:** Coastal vessels should be treated as movable infrastructure and therefore granted such status for the purpose of ensuring competitive funding and fiscal benefits;.
xv.) Introduce fiscal incentives for building & operating small ports (upto 5 metre draft) dedicated for coastal vessels;

(v) **Cabotage Policy Support:** a) Absolute cabotage for coastal trade other than transhipped EXIM containers, including empty containers; **b**) Right to issue NOC to foreign flag vessels on coastal run to INSA; c) Increase the Right-of-First-Refusal price band to 25% above the lowest foreign-bid (up from current 10%);

(iv) **Carbon Credit Scheme:** Currently user industry gets the carbon credit to the exclusion of coastal vessels. There is need to put in place a mechanism to provide carbon credits to coastal shipping providers equivalent to carbon credits availed by the user.

(vii) **Financing of Coastal Ship Acquisition:** Need to encourage/promote specialized window infinancial institutional to fund acquisition of coastal vessels.

(viii) **Separate legislation for Coastal vessels:** Coastal vessels are constructed to specifications of oceangoing vessels even though they are not subject to the same stress and turbulence. This needlessly increases their capital costs. There is a need to suitably amend the Merchant Shipping Act or enact separate legislation for coastal shipping to provide different specifications and lower manning scales.

Inland Waterways

56. Inland Water Transport is the most environment friendly mode with its excellent fuel efficiency and lower emission levels. Neglect of development of IWT infrastructure has made this mode virtually insignificant. Inland Waterways Authority of India (IWAI) is mandated to develop and regulate inland waterways in the country. National Waterways come under the purview of the Central Government while rest of the waterways come in the domain of State Governments. The National Waterways carried 4.92 million tonnes of cargo in 2010-11. These have the potential to carry 18 times the present cargo by 2029-30. IWAI has taken up some projects in collaboration with private sector for movement of cargo on National Waterways.

57. Policy issues for Inland Water Transport sector are:

(i) Integration of waterways with other modes of transportation to form an efficient multimodal transport network is the key to achieve sustainable development of IWT sector**.**

(ii) Public investment in development of waterways shall serve as an important economic lifeline for development of North Eastern (NE) region which has abundant water resources ideal for IWT.

(iii) Policy support for creation of floating infrastructure i.e Barges/ Inland Vessels is critical to attract private capital for development of IWT sector.

(iv) Extending mandatory intermodal share for cargo movements (currently mandated to all PSUs by PMO) to all public limited companies and creation of a suitable tradable instrument to help monetize the environmental advantages of the IWT sector on the lines of Renewable Energy Certificate (REC) can serve as a significant policy support.

(v) An institutional framework to appraise mission critical projects identified by IWAI will ensure timely and effective project development.

(vi) For effective resolution of policy and administrative issues, State Level Coordination Committees (SLCC) of various State Government agencies and IWAI under the State Chief Secretaries is critical imperative.

(vii) Creation of adequate education and training facilities to help sector specific capacity building is necessary.

(viii) For effective development of IWT sector in India all major waterways may be developed with 3 m depth and Government may take a policy initiative in this regard.

58. The **key recommendations of the WG** for development of IWT sector in India are:

(i) **Navigational Infrastructure :**

a) Develop deeper stretches and maintain Least Available Depth (LAD) at 2.5 metres, preferably 3 metres for round the year navigation.

b) A special central fund may be made available for raising vertical clearance of at least 5 metre above HFL to facilitate passage of bigger IWT vessels.

c) Develop intermodal connectivity at IWT terminals through proper connectivity with road/rail.

d) Develop night navigation infrastructure in all National Waterways.

(ii) **Inland Vessels**

a) Revive Inland Vessel Subsidy Scheme.

b) Set up a Special Purpose Vehicle (Inland Vessel Leasing Company) that can procure and lease out the IWT vessel based on market demand.

c) Private sector participation should be explored for development of Maintenances Repair and Overhaul (MRO) facilities in North East States and other National Waterway Corridors.

d) Make IWT vessel building eligible for “Infrastructure Status” to avail easier credit availability

e) Make inland vessel building eligible for priority lending.

f) Bring inland vessels under Tonnage Tax.

(iii) **River Basin Development:** Each river basin should be developed with total integration of multiple users. To this end, a central legislation of “River Basin Authorities” under the control of Ministry of Water Resources will help total development of river basin.

(iv) **River Training Work:** Extensive river training works of spurs and dykes or barrages with navigation locks to be carried out in NW 1 & NW 2 for improving the navigation channel with depth 2.5 m to 3.0 m and width of about 50 metres for accommodating economic size vessels/tugs/barges.

(v) **Modal Integration:** There is need to identify and develop the feeder routes on the water under jurisdiction of State, to National waterways so that the entire channel can be developed on the “fish bone structure” This would involve development of feeder routes in the North East such as Subansiri, Dhansiri, Dibang etc. as well as major tributaries of River Ganga such as Yamuna, Gandak, Kosi, Ghagra etc. Upon successful operations of these feeder routes will pave the way for the improvement of these routes by the development of barrages/weirs with navigational locks to ensure round the year operations of the routes

Similarly, integrate IWT and coastal shipping operations on stretches where feasible to promote seamless connectivity. One way could be combining inland terminals with automated RO-RO systems.

(vi) **International Protocols:** Simplify administrative processes and develop suitable operational support systems to reduce the average turnaround time of vessels plying on protocol route.

(vii) **Access to tradable renewable energy certificate:** Create a suitable instrument to help monetize the environmental advantages of the IWT sector on the lines of Renewable Energy Certificate.

(viii) **Private Sector Participation in Waterways:** Private sector participation into the development, maintenance and regulation of some stretches of rivers for inland water transport may be looked into. Power utilities to bear cost of construction and O&M of material handling at power plant end as in the case with facility for unloading of railway wagon.

(ix) **Training and Capacity Building:** Need to revive and expand inland vessel crew training facilities in different States to meet requirement of manpower in IWT.

(x) **Long Term Cargo Commitment:** Need for a longer term cargo commitment for economic/revenue sustainability. The shipper should provide guaranteed cargo for a specific period of time; focus on a few bulk commodities such as coal and iron ore besides over-dimensional cargo. Fix 50% transportation of coal through IWT for new power projects, where origin-destination is on navigational waterways.

(xi) **Policy Parity- Level Playing Field: (a)** Provide freight subsidy to IWT sector which is presently available for transportation of fertilizers by rail and road; (b) Provide transport subsidy for transportation by IWT mode in the North East; and (c) Abatement of Service Tax to the same extent as that provided to rail and road.

59. A total of Rs. 64,000 crore is proposed for investment in IWT by way of continuation, upgradation and launching of new projects during 2012 to 2030.

Chapter 1: Background

1.1 The National Transport Development Policy Committee (NTDPC) set up by the Planning Commission had constituted a Working Group on "Ports & Shipping Sector" for NTDPC on 19th July, 2010. The composition and terms of reference of the Working Group are as under:

Composition

1 Secretary (Shipping) - Chairman
2 Shri Bharat Sheth, Member, NTDPC
3 Shri Gajendra Haldea, Member, NTDPC
4 Member Secretary/ Co-ordinator, NTDPC
5 Director General, Shipping
6 Director General, Foreign Trade (DGFT), M/o Commerce & Industry
7 Additional Member, Planning, Railway Board)
8 CMD, Shipping Corporation of India
9 Joint Secretary, Ports
10 CEO, Gujarat Maritime Board
11 MD, Container Corporation of India
12 Chief Engineer, Planning, Ministry of Road Transport & Highways
13 External Academic Expert
14 External Academic Expert
15 Shri Jimmy Sarbh, Sarbh Consultancy
16 Shri Krishna Kotak, Managing Director, J.M. Baxi & Company
17 Shri Thomas Netzer, Director, McKinsey & Company.
18 Representative of financial sector (nominated by Secretary, Department of Financial Services)
19 Representative of IT Sector
20 Adviser, (Transport Research) - Convenor

Terms of Reference

1. Review and determine the role of the maritime sector in meeting transport requirements of the economy over the next two decades, keeping in view the need to
    a. Conserve energy and protect the environment,
    b. Promote safety and sustain future quality of life,
    c. Create an optimal intermodal mix.

2. Estimate the potential growth in waterborne traffic by 2020 and 2030 in terms of both passengers and freight by
    a. Sea borne, Coastal and Inland Water.
    b. Major ports and non-major ports.
3. Consistent with the above, assess the current capacity and the required capacity in future, maritime infrastructure, including:
    a. Port infrastructure.
    b. Shipping.
    c. Creation of additional port infrastructure or the creation of ports at new, greenfield sites, and their role in promoting regional development.
4. In light of the above,
    a. Assess the investment required to achieve the projected maritime infrastructure capacity.
    b. Identify sources of funding and assess fund requirements from budgetary, non-budgetary and private sources for different areas in maritime infrastructure.
    c. Identify areas for PPP and the requirement of private and public funding in these areas.
    d. Examine the existing PPP policy framework and policy initiatives including regulatory and institutional framework and suggest changes necessary to attract greater private investment.
5. Examine the regulatory issues including the role of the Tariff Authority for Major Ports (TAMP) and suggest changes in policies concerning ports and shipping.
6. Review the relative role of major and non-major ports and suggest measures for integrated development of the ports sector, including a review of the current legislative provisions.
7. Estimate the energy requirements necessary for port infrastructure and shipping and suggest measures to put water transport sector on a sustainable low carbon path and promote energy efficiency, emission reduction and environment protection.
8. Review the status of rail-road connectivity of ports to the hinterland and make recommendations for development of multi-modal transport systems.
9. Assess the availability of human resources for the maritime sector and suggest measures for skill development and institutional capacity building for various stakeholders.

10. Suggest measures for promotion of research and development and technology upgradation in the water transport sector, including evaluation of technology trends in global shipping.
11. Indicate broad areas and investment for IT in water transport to improve customer interface/satisfaction and internal efficiency.
12. Identify data deficiencies in water transport and suggest measures for improving, maintaining and updating the database, including institutional measures.
13. Review the processes, productivity and efficiency of ports and shipping development and operations and make appropriate recommendations for their improvement.

Order for setting up the Working Group on Ports & Shipping for NTDPC is given at **Annexure-I**.

1.2 Progress of Work

1.2.1 The first meeting of the Working Group (WG) was held on 23rd September, 2010 at Delhi. In the meeting, the members highlighted the problems and challenges related to maritime sector and made several suggestions. The WG decided to set up following eight Sub-groups:

(i) Cargo Traffic, Port Capacity, Investment requirements and review of processes and operations in the port sector to look into following aspects of major and non-major ports :
   (a) Current and future cargo traffic;
   (b) Capacity requirement;
   (c) Investment requirement;
   (d) Policy issues/regulations regarding port sector

(ii) Rail Road Connectivity with Ports to look into current status of port connectivity, container/freight traffic flows and future connectivity requirements.

(iii) Data

(iv) To look into R&D and Technology evolution in Shipping, energy requirements and initiatives to put the shipping sector on a sustainable low carbon path and promote energy efficiency, emission reduction and environment protection.

(v) Information Technology to examine broad areas of IT investment and interface with users.

(vi) To look into existing framework of PPP, private financing and bench marking of Indian Shipping and Port operations/practices and efficiency parameters.

(vii) Shipping to look into status of shipping and requirement, review of processes and operation in shipping, human resource requirement of the maritime sector and related policy issues and regulations.

(viii) Inland Waterways to look into status, status, growth in cargo traffic and its composition, future scenario, infrastructure, technical and regulatory issues related to its operations and potential.

1.2.2 Order for setting up of Sub-groups is at **Annexure-II**.

1.2.3 All the eight Sub-groups, after wide consultations with the stakeholders had submitted their reports to the Chairman. The Convener of the Working Group, after examination of the Working Group report prepared draft report of the Working Group. The sub-group reports and the draft report of the WG were discussed in the second meeting of the WG held on 9th December, 2011. The suggestions of the members of the draft report have been incorporated in the final report. The report was also discussed with the Chairman, NTDPC who desired that projections should take into account slowdown in world trade (volume of goods) and in domestic growth in 2011-12. Important policy issues were also discussed with the NTDPC. The important policy issues and recommendations of the Ministry of shipping are at Appendix-I.

1.3 Organisation of the Report

1.3.1 The report has been divided into 10 chapters. Chapter 1 is introductory in nature giving the brief background of the formation of the WG, its composition, the Terms of Reference, the programme of work followed and organization of the report. Chapter 2 outlines the challenges confronting India’s maritime sector. Commodity groupwise cargo traffic projections at Indian Ports up to 2031-32, port capacities required to handle the cargo traffic up to 2031-32 and investments required to create the required cargo handling capacity are given in Chapter 3. The policy agenda for development of port sector is also covered in Chapter 3. Current status of port connectivity, container freight traffic flows and future connectivity requirements are identified in Chapter 4. Issues relating to data gaps in various sub-sector of water transport sector and suggestions for meeting those data gaps are given in Chapter 5. Chapter 6 outlines the technology evolution in shipping, energy requirements, areas of research and development for sustainable low carbon path and promoting energy efficiency and environment protection. Existing status of information technology (IT) implementation in India’s maritime sector is reflected in Chapter 7. Use of technology for (i) improving e-governance, for improving efficiencies of (i) ports, (ii) DG shipping and (iii)

IWAI are also detailed in the Chapter. The existing framework of Public-Private Partnership (PPP), private financing and bench marking of Indian shipping and port operations/practices and identification of initiatives to speed up project implementation in port sector are dealt in Chapter 8. Chapter 9 gives status and future shipping requirements of shipping tonnage, policy and tax issues affecting the shipping sector and key recommendations to improve the cargo traffic of Indian shipping in world trade. The status of cargo traffic on inland waterways in India, cargo traffic potential, problems of infrastructure and issues related to operation of waterways and development are dealt in Chapter 10 of the report.

Chapter 2: Challenges for Ports & Shipping Sector

2.1 Introduction

2.1.1 Global economic integration relies upon efficient maritime transport due to its unparallel physical capacity and ability to carry freight over long distances and at low costs. Maritime transportation plays a major role in the national and international trade and economic growth. The seaborne trade represents more than 80% of the international trade in the world. Seaports in relation to trade are major gateways to the economy of a country. Nearly everything we import comes to us on a ship, through one of our nation's seaports. In turn, nearly everything India sells in the global market place makes its way there via our seaports.

2.2 Ports

2.2.1 Maritime Transport is the shipment of goods (cargo) and people by sea and other watreways. Port operations are necessary tool to enable maritime trade between trading partners. Ports represent a complex structure in a country's transportation system providing **ship harbour interface** services such as pilotage, dredging, provision of berths, maintenance of navigational channels, etc., **ship-port interface** in terms of loading and unloading cargoes and **port-land interface** in delivering cargo to and from the hinterland. Thus seaports serve as the interface between maritime and inland transportation, play a significant role in the economic development of a country. Maritime transport is the backbone of global trade.

2.2.2 Seaports in India are responsible for a varied range of economic activity. They generated large resources in tax revenue through customs collections, moved more than 80 percent of the country's overseas cargo, and handled close to 912 million tons of cargo in 2011-12.

2.2.3 Today in any context and in any country, it is essential that ports provide efficient, adequate and competitive services. If they fail, ship-owners who find them too costly or too slow will go elsewhere. Hence if ports do not provide cost-effective services, imports will cost more for consumers and exports will not be competitive on world markets.

2.2.4 Draft limitation at Indian ports constrain access of large main line vessels. This entails transportation of goods from India to major export destinations to be transshipped at larger ports (Dubai, Singapore). Transshipment means additional handling of shipments, which is more expensive. Consequently shipping costs escalate which erodes cost advantage of Indian exports.

2.2.5 Ports should not be viewed in isolation but as being interdependent with and as the other modes of transports, road or/and rail for their existence and efficient performance. Lack of integrated or intermodal transportation constrains quick evacuation of cargo through other modes of transport if rail-road connectivity from the ports and hinterland is inadequate.

2.2.6 Seaports are centers of commerce and trade, busy and dynamic transportation hubs that are constantly adapting to meet ever changing global trade demands. Seaports help build and grow international trade, and strengthen local and national economies. The seaports due to their strategic location foster industrial growth. Industries are located close to seaports in order to reduce the cost of transportation. Maritime transport spawns growth and development of a wide range of economic activities. These include ship building and ship repair yards, construction industry engaged in construction, maintenance and dredging of seaports and inland waterways; information technology for safe navigation and processing etc. The increased turnover of those engaged in maritime activity contributes to the gross domestic product.

2.2.7 Industries tend to cluster in the vicinity of ports to reduce transportation costs especially outward/export oriented industries. Some of the India's maritime States have made a conscious attempt to foster port based industrial development.

2.2.8 In addition maritime transport creates wide range of employment opportunities to meet its various needs. Ports provide employment opportunities directly and indirectly. These include jobs in shipbuilding and repairs, seafarers, technical persons to man ships, freight forwarding, stevedoring, tonnage, pilotage, warehousing, financial services, etc.

2.2.9 It is noteworthy that vessels make money when they are on the move and that the time spent on discharging and handling cargo carried by vessels cost the shipping lines money on the crew, port charges, running costs, etc. and so less the delay in turnaround time (i.e. time to berth, unload cargo, load any new cargo and leave the port), the better for the vessels since delay entails heavy costs depending on the size of the vessels. Slow cargo discharge and stacking and clearing operations lead to low throughput, longer turnaround time etc. These factors impact port competitiveness and make them user unfriendly unattractive.

2.2.10 Electronic data interchange for the transmission of message and documents and other information technology applications for movement of cargo in transit and clearing goods should be in place. Vessel Traffic Services (VTS) that involves a traffic monitoring service for improving safety, efficiency of vessel traffic and protection of the environment should be effective and efficient. Based on VTS, vessels follow a predetermined movement depending on their size and type, cargo carried, berth availability, pilotage requirements and can be an effective tool to reduce/eliminate port delays.

2.2.11 The increase in the level of activities in the ports as reflected in the number of vessels calling at the ports and the volume of cargoes handled calls for the assessment of the capacity of the ports to handle present and future cargo throughput. Availability of storage space influence the efficiency and productivity of any port since, there is an almost inevitable mismatch between the rate of cargo transshipment and the rate at which it enters and leaves the port on the landward side.

2.2.12 The operating port system is where the port authority provides the superstructure and carries out the functions of pilotage, stevedoring activities, warehousing and cargo delivery. On the other hand in the landlord port, the port authority provides the port facilities while the private operators provide the plants and equipment and carry out the functions of cargo delivery and discharge. A mixed port is a combination of both port systems.

2.2.13 Deep-draft seaports are dynamic, vibrant centers of trade and commerce, but what's most important to understand is that they depend on partnerships, both public and private.

2.2.14 We must ensure that there is adequate, safe and seamless access to ports from land and at the same time ensure modern, navigable waterside access with channels that are deep and wide enough to handle today's modern vessels and marine highways to provide transportation options for moving cargo between ports.

2.2.15 These priorities should be included in a long term, national transportation plan that addresses freight mobility, congestion and productivity. Without such a plan and the necessary investment to support it, economy will be less competitive. Seaports play a critical role in our economic development; however, connecting infrastructure to ports requires higher levels of investment. This Chapter provides an outline of policy framework to meet the challenges confronting India's maritime sector.

2.2.16 Shipping is necessary for the development of the national economy as well as to keep supply lines open for transportation of essential commodities during peacetime and emergencies such as war and famine. The existence of strong and viable national fleet serves as balancing factor in the freight market. The key issues facing Indian shipping sector are greater cargo support, cargo assurance through long term charter of vessels, tax regime which enables Indian shipping companies to compete globally, promotion of coastal shipping and equal treatment for Indian seafarers plying on vessels in International Waters and Indian territorial waters.

2.2.17 Inland Water Transport is the most environment friendly mode with its excellent fuel efficiency and lower emission levels. Lack of development of IWT infrastructure has constrained full exploitation inland water transport mode. National Waterways come under the purview of the Central Government while rest of the waterways come in the domain of State Governments. The National Waterways carried 4.92 million tonnes of cargo in 2010-11. These have the potential to carry 18 times the present cargo by 2029-30. IWAI has taken up some projects in collaboration with private sector for movement of cargo on National Waterways. The challenges for inland water transport sector are integration of waterways with other modes of transportation to form an efficient multimodal transport network to achieve sustainable development of IWT sector; development of waterways in North Eastern (NE) region which has large potential/navigable stretches for IWT; Policy support for creation of floating infrastructure i.e Barges/ Inland Vessels is critical to attract private capital for development of IWT sector and Creation of adequate education and training facilities to help sector specific capacity building is necessary.

Chapter 3: Cargo Traffic, Port Capacity, Investment requirements in the Port Sector

3.1 Introduction

3.1.1 India has a coastline of 7517 km with 12 Major Ports and 199 notified Non-major Ports along the coastline and Islands. Major Ports are the ports which are administered by the Union Government, while Non-major Ports are administered by the State Governments.

3.1.2 During 2011-12 Major and Non-major ports in India accomplished a total cargo throughput of 911.7 million tonnes reflecting a modest increase of 3.0% over 2011-12 compared to a growth of 4.2 % in 2010-11. The growth in cargo handled at Major and Non-major ports in 2011-12 was 1.7% and 11.5% respectively compared to 1.6% and 9.1% achieved in 2010-11. The deceleration in overall growth in India's seaborne cargo traffic in 2011-12 reflects slowdown in global and domestic growth during the course of 2011-12.

3.1.3 The year 2011-12 was a challenging year for the Major Port Sector as it was buffeted by three exogenous shocks (a) growth in major industrial countries which are a major market for Indian merchandise trade decelerated from 3.2% in 2010 to 1.6% in 2011 and is projected to grow at mere 1.4% for 2012. Similarly, growth in world merchandise trade decelerated sharply from 14.3% in 2010 to 6.3% in 2011; (b) India's GDP growth slowed down from 8.4% in 2010-11 to 6.5% in 2011-12. Slowdown and decline was pronounced in case of India's GDP pertaining to manufacturing and mining sectors: while growth in manufacturing slowed from 7.6% in 2010-11 to 2.5% in 2011-12, growth in mining sector made a complete about turn from 5% in 2010-11 to -0.9% in 2011-12; (c) series of judicial interventions leading to ban/restrictions on iron ore exports which resulted in more than 30% decline in its export. Iron ore loadings at major ports at 60.69 MT in 2011-12 were 27 MT lower compared with iron ore loadings 2010-11 leading to overall shortfall of 30.5 MT between the target and achievement for overall cargo traffic for 2011-12. These exogenous factors to a large extent reflect in sharp fall in iron ore loadings and deceleration in container traffic from 12.7% in 2010-11 to 5.4 % in 2011-12.

3.2 Cargo traffic at Major Ports in 2011-12

3.2.1 Cargo traffic at 560.1 million tonnes at India's 12 major ports during 2011-12 accounted for 61.4% of India's total sea borne cargo. Total cargo of 560.1 million tonnes comprises of cargo loaded, cargo unloaded and transhipped to the tune of 194.1 million tonnes, 341.6 million tonnes and 24.4 million tonnes respectively. The overall compound Annual rate of Growth (CAGR) of traffic at major ports during 1950-51 to 2011-12 has been 5.6 percent, whereas during the post- liberalisation period i.e. from 1991-92 to 2011-12, the CAGR was 6.6 percent. **The CAGR of traffic growth at major ports for the last 5 years was 3.8 percent.**

3.2.2 Commodity groupwise analysis of last 5 years of CAGR reveals that the **highest CAGR of 10.4% has been observed in container traffic, followed by 7.0% for Fertilizer and Fertilizer raw material** and 5.5% for the coal. As far as the cargo composition is concerned, there has been a significant change in the share of Iron Ore and container traffic during the past 5 years. The share of container traffic increased from 15.8% in 2006-07 to 21.5% in 2011-12 while the share of Iron Ore decreased from 17.4% in 2006-07 to 10.8% in 2011-12. During 2011-12, POL traffic maintained a dominant share of more than 32%, followed by Container traffic (21.5%), Other cargo (18.0%), Iron ore (10.8%), Coal (14.1%) and Fertilizer & FRM (3.6%).

3.3 Non – Major Ports

3.3.1 Non-major ports in India collectively handled 351.51 million tonnes of traffic during the year 2011-12 as compared to 95.52 million tonnes of cargo handled in 2001-02. The CAGR growth in traffic during 2001-02 to 2011-12 achieved by Non-major ports was 13.9% compared with 6.9% achieved by Major ports in the country. The share of cargo traffic of Non-major ports in the total cargo traffic handled by all ports in India has increased steadily from 24.9% in 2001-02 to 38.6% in 2011-12. POL & its products (45.8%) was the single largest commodity handled at non major ports in 2011-12 and its share has ranged between 44% (in 2006-07) to 55 % (in 2001-02). It is observed that during last five years, the relative shares of commodities handled by the non major ports have not shown any pronounced shift. In 2011-12, the share of coal in the total traffic was 22.3% followed by Iron Ore (10.3%) and Building Material (3.2%).

3.3.2 The Table 3**A** gives commodity- wise CAGR of cargo traffic of Major Ports, Non-major ports and for all ports from 2001-02 to 2011-12 and 2006-07 to 2011-12.

Table 3A : CAGR Cargo Traffic						
Commodity	**20001-02 to 2011-12**			**2006-07 to 2011-12**		
	Major Port	**Non-major Port**	**Total**	**Major Port**	**Non-major Port**	**Total**
POL	5.7	7.8	6.4	4.7	6.4	5.4
Iron ore	19.2	14.9	17.6	-5.5	-2.0	-4.4
Coal	4.4	24.1	10.0	5.5	40.7	16.0
Fert & FRM	19.3	16.6	18.1	7.6	15.8	10.5
Containers	12.4	-	14.8	10.3	29.7	12.8
Other cargo	2.1	14.5	6.2	1.6	16.9	7.3
Total	**6.9**	**13.9**	**9.1**	**3.8**	**13.7**	**7.0**

3.4 Capacity at Major Ports

3.4.1 The total cargo handling capacity at the Major Ports exceeded the actual traffic handled for the first time in 2000-01 with little excess capacity in subsequent years.. The capacity in the Major ports as on 31.03.2012 was 696.53 million tonnes against the traffic of 560.1 million tonnes with a capacity utilization of 80.4%. The capacity at Non-major ports as on 31.03.2012 is estimated at 445 million tonnes against a traffic of 351.5 million tonnes reflecting capacity utilization of the order 79%.

3.5 Investment in major Ports

3.5.1 During the 11th Five Year Plan, an amount of Rs.5621.93 crore was allocated out of which Rs.3717.07 crore was utilized, thereby showing a utilization of 66.18%. The year-wise allocation and expenditure during XIth Plan is given in Table 3**B.**

Table 3B: Plan Outlay and Expenditure			
Year	**Plan Outlay (Rs. in crore)**	**Expenditure incurred (Rs. in crore)**	**Percentage of Plan utilization**
2007-08	941.29	646.37	68.67
2008-09	1386.52	877.19	63.26
2009-10	1677.00	1050.00	62.61
2010-11	1617.12	1165.67	72.08
2011-12	1849.9	1180.21	63.82
Total	**7471.02**	**4919.44**	**65.85**

3.6 Projection of Cargo Traffic, Capacity and Investment upto 2031-32

3.6.1 Cargo Traffic

3.6.1.1 Cargo traffic at Indian ports is affected in the short run by global economic and trade conditions and state of domestic economy. The sharp slowdown in the growth of world trade and in domestic growth in 2011-12 impacted Cargo traffic at Indian ports. As a consequence, the projections for Cargo traffic to be handled by Indian ports have been reworked. **The growth in cargo traffic handled by Major ports in the first quarter of 2012-13 was -5.5%.** Considering the weak global growth prospects and weakening of domestic growth dynamics, the cargo traffic at major ports is expected to grow at 3% in 2012-13 and thereafter at 6% for the remaining 4 years of the XIIth Plan. For Non-major ports the annual growth cargo traffic is assumed at 10%. Keeping in view the trends in the share of commodities in the Cargo traffic at Major ports and Non-major, the cargo traffic at Indian Major port and Non-major ports in maritime States is estimated to increase from 911.7 million tones in 2011-12 to 1315 million tones in 2016-17. Table 3**C** gives the Commodity-wise projected traffic of Major & Non-Major ports up to the end of XIIth Plan.

Table 3C : Projected Cargo Traffic at the end of XIIth Plan

Commodity	2016-17		
	Major Port	**Non-major Port**	**Total**
POL	218.5	246.6	465.1
Iron ore	65.6	58.7	124.3
Coal	116.5	146.8	263.3
Fert & FRM	22.6	20.5	43.1
Containers	167.5	47.0	214.5
Other cargo	137.7	67.5	205.2
Total	**728.4**	**587.0**	**1315.4**

3.6.1.2 Cargo Traffic Projections during 2017-18 to 2031-32

3.6.1.2.1 The cargo handled at Indian ports mainly comprise of POL, Iron ore, coal and General cargo (in containers or break bulk). General cargo traffic handled at ports is affected by the changes in the global economy and domestic manufacturing activity. The Cargo traffic for subsequent year's upto 2031-32 has been projected using expected growth rate for various commodity groups based on perceptions of the user Industry and long term growth rate trends. Cargo traffic for the period 2017-18 to 2031-32 has been estimated using different growth rates across broad commodity groups; 4% for POL as long term availability of crude oil is likely to be tight resulting in high level of crude prices; Iron Ore export will need to be balanced keeping in view domestic consumption requirements of steel industry and environmental concerns, therefore, a modest growth of 2 % in cargo traffic of iron ore (mainly loadings) is expected; 5% for Fertiliser & FRM to meet domestic demand-supply mismatch, 8% for Coal to meet the requirement of Thermal generation and steel plants and; 7% each for Container and other Cargo due to increase in trade of manufactured goods.

3.6.1.2.2 The projected cargo traffic at the end of XIIth Plan (2016-17), XIIIth Plan (2021-22), XIVth Plan (2026-27) and in 2029-30 are given in Table 3**D**.

Table 3D: Commoditywise Cargo Traffic Projections (Major & Non-major Ports)

(Million tonnes)

Commodity Year	POL	Iron ore	F&FRM	Coal	Containers	Other cargo	Total
2016-17	465.1	124.3	263.3	43.126	214.5	205.1	1315.4
2021-22	565.8	137.2	386.9	50.0	315.2	287.8	1742.8
2026-27	688.4	151.5	568.4	58.0	463.1	403.6	2332.9
2031-32	837.6	167.2	835.2	67.2	680.4	566.1	3153.7

3.6.2 Capacity Required at Indian Ports during 2012-13 to 2031-32

3.6.2.1 Capacity Requirement at Indian Ports during 12th Plan (2012-13 to 2016-17)

3.6.2.1.1 The international practice for ports is to plan for cargo handling capacity of 30% more than the projected cargo traffic so that pre-berthing detention of ships on port account is minimised. The cargo handling capacity have to be planned separately for each commodity group as each of them require different configuration of facilities. The estimated capacity at the end of XIth Plan at all major ports and Non-major Ports is estimated at 696.5 million tones and 445 million tonnes respectively against traffic at 560.1 million tonnes at Major ports and 351.6 million tonnes at Non-major ports respectively. The traffic at Major and Non-major ports is expected at 728.4 million tones and 587 million tonnes by the end of the XIIth. Keeping in view the projected traffic at Major & Minor ports, the capacity required by Major and Non-major ports at the end of 12th Plan is estimated at 1710 million tones.

3.6.2.1.2 Based on cargo traffic projections, commodity-wise total capacity requirement at the end of the year have been worked out from 2017-18 to 2031-32. Table-3**E** gives Commodity-wise capacity required at the end of XIIth Plan 2016-17), XIIIth Plan (2021-22), XIVth Plan (2026-27) and XVth Plan (2031-32) to handle projected traffic.

Table 3E: Commoditywise Cargo Capacity Projections (Major & Non-major Ports)							
(Million tonnes)							
Commodity Year	POL	Iron ore	F&FRM	Coal	Conta-iners	Other cargo	Total
2016-17	604.6	161.5	342.3	56.1	278.8	266.7	1710.0
2021-22	735.6	178.3	502.9	65.0	409.7	374.1	2265.6
2026-27	894.9	196.9	739.0	75.3	602.0	524.7	3032.8
2031-32	1088.8	217.4	1085.8	87.3	884.5	735.9	4099.8

3.6.3 Investment Required during 2012-13 to 2029-30 in Port Sector

3.6.3.1 In order to create capacity necessary to handle projected traffic in XIIth Plan, a number of port development projects have been identified by Major Ports and Maritime States to be taken up by the terminal year of the 12th five year plan (2016-17). Most of the projects/ schemes conceptualized for capacity augmentation are through PPP mode. Based on the plans of Major ports and maritime States, the investment required and pattern of financing for capacity addition of 250.4 million tones at Major Port and 318.1 million tonnes at Non-major ports during XIIth Plan is given in Table-3**F.**

Table 3F: Investment by Major and Non-major Ports during XIIth Plan (Rs Crore)				
	GBS	**IEBR**	**Private Sector**	**TOTAL**
Major Port				
Construction of Berth/Jetties	166.0	4203.7	9448.3	13818.0
Dredging	3303.2	3791.8	0.0	7095.0
Port equipment & Machinery	0.0	1022.9	558.4	1581.3
Rail-Road Connectivity	0.0	3442.6	5531.1	8973.7
Total (Major Port)	**3469.2**	**12461.0**	**15537.8**	**31468.0**
Non-major Port				
Construction of Berth/Jetties	0.0	812.7	20024.8	20837.5
Dredging	45.0	369.1	3227.0	3641.1
Port equipment & Machinery	11.3	540.1	3306.1	3857.6
Rail-Road Connectivity	777.9	286.8	2963.6	4028.3
Total(Non-major Port)	**834.2**	**2008.8**	**29521.5**	**32364.5**
ALL ports				
Construction of Berth/Jetties	166.0	5016.4	29473.1	34655.5
Dredging	3348.2	4160.9	3227.0	10736.1
Port equipment & Machinery	11.3	1563.0	3864.6	5438.9
Rail-Road Connectivity	777.9	3729.4	8494.7	13002.0
Total (All Ports)	**4303.4**	**14469.8**	**45059.3**	**63832.5**

3.6.3.2 For estimates of investments required beyond 12th Plan, considering the constraints in estimating investment required during 2017-18 to 2031-32 to create capacity at ports for handling the projected cargo, the Working Group has adopted the following methodology. The projected cargo for 2017-18 to 2031-32 has been estimated separately for different commodities (or groups). In order to project the investment required to create capacity at ports, it is pertinent to note that investment required to create one million tonne of capacity for a commodity-group varies from commodity to commodity. The investment required to create one million tonne of capacity in an existing port varies vastly from the investment required in a new port.

3.6.3.3 Tariff Authority for Major Ports (TAMP) decides upfront tariffs for ports based on capital cost to be incurred for creating capacity at a Major port. Based on upfront tariffs approved by TAMP for projects from 2010-11 onwards, the average capital cost to be incurred by Major Ports for handling one tonne of cargo in respect of different cargo commodity groups at 2010-11prices works out at Rs 52 crore for POL,Rs 63 crore for iron ore, Rs 51 crore for Fertiliser & Fertiliser Raw material, Rs 55 crore for coal, Rs 67 crore for Containers and Rs 56 crore for Other general cargo. These cost have been inflated at 8% to arrive at 2011-12 prices which have then been used to estimate the investment required by Major Ports and Non-Major ports for creating the projected port capacity. In addition to direct investment for creating capacity, ports also require investment for creating other facilities like deepening and maintaining of channels, rail and road connectivity and other infrastructure at ports. Plan-wise investment required for creative capacity during XIIIrd, XIVth and XVth Plan at Table-3**G**.

Table 3G : Projected Investments (Rs Crore)

(Rs Crore)

Year	GBS	IEBR	Private Sector	TOTAL
2012-13 to 2016-17	4303	14470	45059	63833
2017-18 to 2021-22	4248	14284	44481	63013
2022-23 to 2026-27	5879	19767	61554	87200
2027-28 to 2031-32	8193	27547	85782	121522
Total	22623	76068	236877	335568

3.7 Policy Issues/regulations

3.7.1 The Ministry of Shipping has in their Maritime Agenda 2010-20 laid out policy agenda for the future. Salient features of that agenda are:

(i) The Major ports to continue to work towards implementing 'landlord port' concept duly limiting their role to maintenance of channels and basic infrastructure leaving the development operation management of terminal and cargo handling facilities to the private sector.

(ii) Public Private Partnerships will be the preferred mode for the development of port terminals and other commercially viable activities in the Major Ports.

(iii) Policy has been laid down to prevent private sector monopoly in Major Ports.

(iv) There is a need for a Port Regulator for monitoring and regulating the service levels, technical & performance standards.

(v) The environmental clearance process be reviewed as one of the major factors for delay in the fructification of projects is the long environmental clearance mechanism procedure.

(vi) Protection of environment is an indispensable factor for sustainable economic growth. Environmental issues including the handling of hazardous and noxious substances in a port, prevention of air, water and soil pollution in ports, treatment of ballast water etc., need to be addressed and tackled. The port industry in general is faced with sustainability issues – compliance to international and national regulations vis-à-vis demands for bigger port capacity and increased productivity without compromising environmental quality. Without regulation, it would be difficult to implement greener practices, as these may put operators at a competitive disadvantage. Other related issues are availability of incentives to encourage green practices, cost and availability of clean fuel, the need to do more research on green technologies, use of shoreside power, training programmes for such industry and designating emission control areas.

(vii) Recognising the need to impart structured training to all port personnel including officers, it is essential to re-train them towards multi-skilling. Every employee should undergo different tiers of training programme during his service. Focus would be on revamping of port based training institutions.

(viii) Inadequacy of pilots to navigate vesels in the channels need to be addressed.

(ix) Financial support for dredging is necessary for reducing the port charges.

(x) To ensure seamless flow of cargo, non-major ports need to work with the State Governments and other authorities to commission 4 - lanes Road connectivity and 2 - lanes

Rail Connectivity at their ports so as to facilitate speedy evacuation of cargo. Similarly, Major Ports may endeavour to expand their connectivity to 8-lane Road Connectivity and 4-lanes Rail-connectivity by 2020.

(xi) There is a need to develop at least 4 hub ports to receive the 13,500+ TEU containerships.

(xii) A comprehensive policy need to be evolved for cruise shipping with adequate arrangements in terms of state of art Passenger Terminals, Baggage screening, Customs clearance, Immigration, Tourism related ancillaries backed up by effective publicity so that Indian Ports also become truly world class destinations as in the case of Singapore, Dubai and several western European and Caribbean countries.

(xiii) Maritime projects are specialized in nature and they require a specialized scrutiny and appraisal for obtaining the finances. There is a need for a specialized Maritime Finance Corporation with the equity of ports and financial institutions to fund the Port projects.

(xiv) There is need to strengthen co-operation with international organizations for sharing the expertise in cargo handling operations and port management, exchange of information, co-operation in training needs and modules development, establishing joint ventures of mutual interest, promoting synergy and trade facilitation in the areas of their expertise etc.

(xv) The Governments, both Central and State should transform the legislative frame-work in tune with the current requirements. Necessary amendments to the Major Ports Act, 1963, Indian Ports Act, 1908 and Maritime Board Acts of respective State Governments need to be carried out.

(xvi) India with immense expertise in operating ports with highly skilled manpower and specialised knowledge in port operations, should float a special purpose vehicle for making investments in ports abroad to become a truly global power in Port Sector world-wide. It would be appropriate to incorporate a new special purpose vehicle to pursue the objectives.

3.8 Interaction with Stakeholders

3.8.1 The Working Group had called for suggestions from stakeholders viz. non-major Ports and terminal operators, industries importing/exporting cargo, maritime companies. Some of the areas of concern of Stakeholders of the port sector are:

(i) The private ports and new upcoming ports are subject to the Navigational Safety in Ports Committee (NSPC) inspection and audits on yearly basis and whenever they add a new facility. This process takes a long time. A timeframe should be laid down within which the audit must necessarily be completed, preferably within 60 days of port declaring readiness for the audit.

(ii) To address the shortage of pilots, it is suggested that Chief Officers/ 2nd mates and 3rd mates be permitted to train as Pilots by undergoing longer training schedules.

(iii) To reduce manning cost of Port Crafts, it is suggested that manning for all crafts which are exclusively used for Port Operations in all the ports of our country without exception be permitted to be manned as per Inland Vessel Act.

(iv) Dredging cost is a major recurring expenditure for all Indian ports. The ports should be allowed to build dredgers as per Merchant Shipping (MS) Act and man them as perInland Vessel (IV) or River Sea rules as they deem fit. This will ensure that ports are able to deepen and maintain their channel approaches and berth faces with minimal cost.

(v) The state Maritime Boards be allowed to regulate the private ports and emphasis should be on self regulation rather than through complex rules and regulations

(vi) The legislative frame work needs a relook in tune with the current requirements. The present Port Acts would need to be suitably amended so that the private ports come under the same umbrella as available to major ports under the Major Port Act. It is important that the Indian Port Act of 1908 and the MS Act are thoroughly revised and new laws brought in place so that the laws are in line with the developments, which have taken place in the shipping industry in the last 5 Years.

(vii) When the port sector was opened for privatization, Tariff Authority for Major Ports (TAMP) was created as an independent tariff fixing body for port related services. Since then many new ports have come up and many new ones continue to be built. The existing and new ports compete with each other for traffic. Thus scope for monopolistic practices is constrained. India now has a competition commission which regulates monopolistic anti-competitive behavior in all sectors. Tariff fixation i.e Scale of rates for cargo handling and vessel related services is fixed by the TAMP. Owing to TAMP's regulation, major ports do not have the flexibility in fixing tariff vis-à-vis the non-major ports with whom those compete and are not subject to tariff regulations.

3.9 Inter-port and Intra-port Competition

3.9.1 Competition discourages the abuse of market power and monopolistic rent seeking by port operators and service providers and drives innovation. The port competition can be *inter-port competition,* where ports or port service providers compete within the same cargo hinterland; *intra-port competition,* where service providers compete at the same port for the same market using different terminals, which they typically control; and *intra-terminal competition,* where suppliers provide competing services from the same terminal.

3.9.2 Factors constraining inter and intra port competition are high entry and exit costs and high fixed cost compared to variable costs. Under the freedom of navigation arrangements, shipping service providers have no barriers to entry and are able to deploy assets into shipping routes in an unregulated manner. Consequently, despite the existence of liner conferences and high replacement cost of ships and relatively low margin in the management of shipping services, the trading community are able to access a variety of shipping services at competitive costs.

3.9.3 The policy approach of the Government has been to mitigate monopoly domination by a single Operator. The policy states that if there is only one private terminal/berth operator in a port for a specific cargo, the operator of that berth or his associates shall not be allowed to bid for the next terminal/berth for handling the same cargo in the same port. Earlier, when the JNPT was to award third terminal, they debarred the then existing P&O Australia from bidding for the third Terminal. Aggrieved by this decision P&O Australia went up to the level of Supreme Court but lost. Similarly, PSA was not allowed to bid for the second Terminal in Tuticorin and DP World was barred from bidding for the second container terminal in Chennai port. Private terminal operators have expressed their reservations on this policy. First, given a situation where demand exceeds the supply as far as container handling capacity is concerned is it desirable to bar incumbent terminal operators from bidding in the same port. Second, there is an independent Tariff setting Authority for Ports which fixes tariffs subject to a predetermined cap on return on investment. Third, competition issues should better be left for the consideration of the Competition Commission which was set up in India under the provisions of the Competition Act, 2002. The Competition Act lists several factors that will be considered when dealing with a complaint alleging abuse of a dominant position. Other than the usual suspects like market share, size and resources of the enterprise, they also include factors like vertical integration of the enterprise, social obligations and social costs, relative advantage by way of contribution to the economic development by the enterprise enjoying a dominant position and dependence of the consumers on the enterprise.

Chapter 4: Rail Road Connectivity with Ports

4.1 Introduction

4.1.1 India has got a coast line of 7517 km. covering maritime States of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra, Gujarat and Andaman, Nicobar & Lakshadweep islands. Growth in major ports' traffic is moderate whereas there is a much higher growth of traffic at non major ports. Ports are no longer isolated entities and today are nodes for interchange amongst various modes of transport and a vital element in global logistics chain. As India is opening up its economy, the share of trade is going up steadily and the expectation of port user will be in terms of time, cost and quality. Ultimately the commodity from the source of production has to reach the consumer in the shortest possible time and in the most cost effective way. It is the production driven need for an integrated global logistics chain that has led to inter-modalism with ports emerging as dynamic nodes in the international production and distribution network.

4.1.2 The connectivity to the port can be through all the three modes namely rail, road and inland waterways. To a limited extent inland waterway connectivity exists in Kolkata, Mormugao and Kochi ports. Adequate Rail/Road is very important so that the consumers get the goods in the shortest possible time. The focus of the Sub Group Report is on: (1) Analysis of adequacy of connectivity – both present and future; (2) Optimization of hinterland connectivity – relevant issues and suggested approach and ;(3) Policy Road map for the future

4.2 Adequacy of Connectivity

4.2.1. Capacity at Major Ports: Capacity utilization at India's Major Ports has reached a saturation level as indicated in Table 4A.

Table 4A: Capacity Utilisation at Major Ports (Last 5 years)

Year	Traffic Handled (In million tonnes)	Capacity (in million tonnes)	Percent Utilisation (%)
2007-08	519.32	532.07	97.60
2008-09	530.54	574.77	92.30
2009-10	561.09	616.73	90.98
2010-11	570.03	670.13	85.06
2011-12	600.63	702.80	85.46

4.2.2 The total cargo handling capacity in the Non-Major Ports vis-à-vis traffic handled has been compared to find out the percent utilization and is also touching saturation levels (Table 4B).

Table 4B: Capacity Utilisation at Non – Major Ports			
Year	**Traffic Handled (In million tonnes)**	**Capacity (in million tonnes)**	**Percent Utilisation (%)**
2010-11	314.64	418.29	75.22
2011-12	351.51	445.00	78.99

4.2.3 Port traffic both at major port as well as at non-major ports has been growing but at varying rates. The traffic at non-major ports has grown at a faster rate compared to non major ports. Given the growth in capacity and traffic at non major ports it is important to provide hinterland connectivity and other infrastructure. The capacity utilization figures at both major and non-major ports have been above 70% which implies that cargo evacuation facilities are under great strain, warranting effective quick evacuation within the ports as well as to the external hinterland.

4.2.4 Existing Connectivity to Ports

4.2.4.1 Major Ports: A brief overview of the present rail and road connectivity status in Major ports is given port wise below:

(i)Kolkata Port: The Port has vast hinterland comprising the entire Eastern India and two land-locked neighboring countries, Nepal and Bhutan; it is well linked by road and railways with the rest of India. City roads connect the port to National Highways 2 and 6 and to the junction of National Highway 34 and the Airport. The 10 kms stretch from the port to the junction of NH-2 and NH-6 including 1.7 kms long elevated road link between Vidyasagar Sethu and Swing Bridge is being undertaken. The rail connectivity to the port is provided by the Sealdah-Budge Budge Branch Line to Majherhat Junction.

(ii)Haldia Dock Complex: Haldia Dock Complex is connected to NH-41 which links it to NH-6 and the rest of the country. Four laning of 52.2 kms stretch of NH-41 from Kotaghat-Haldia is in progress. A single rail line from Panskura-Haldia Branch Line connects the docks to the Trunk Railways. Doubling of the 15.05 kms stretch of this line from Panskura to Rajgoda has been completed.

(iii) Paradip Port: The port is connected to NH-5 through a two lane road (78 kms.) up to Chandikol. Four laning of the road is completed. The two lane State Highway 12 from the port to Cuttack provides network between the port and the mines. Port is connected by a Double line section with Cuttack which connects Howrah-Chennai Trunk Line. The 155 kms Daitari-Banspani rail line is under construction. The 78 kms Haridaspur-Paradip Rail Link to provide a dedicated corridor from the Port with the iron ore mines and steel plants is also under construction.

(iv) Visakhapatnam Port: The port has two harbours viz. Inner Harbour and Outer Harbour. The port has one of the deepest container terminal among major ports (14.9 mtrs). The port is connected to NH-5. A project for improving the 12.47 kms long stretch of Naval Dockyard and Industrial by pass State road is available. The port is also connected to the Chennai –Howrah main railway line of the East Coast Route.

(v) Ennore Port Limited: The first corporate Major port in India, the port is situated at Ennore, 25 kms north of Chennai on India's east coast. The port is a functional landlord port. The port is connected to NH-4, NH-5 and NH-45, Rail connectivity from the port is also available. Ennore – Manali Road improvement Project (EMRIP) costing around Rs. 600 Crore is to be executed by SPV (comprising NHAI, Chennai Port Trust, Government of Tamilnadu and Ennore Port Ltd). The objective of the project is to widen and strengthen a number of roads including Ennore Expressway, Manali Oil Refinery Road etc. covering a distance of 19 Kms. This road improvement plan is envisaged to improve the connectivity to Ennore and Chennai Ports. Northern Port Access Road i.e. "Ennore Port – Thatchur Road" of length 25.5 kms. to NH-5 at a cost of Rs.455 Crore is also being taken up through NHAI. A new BG line between Puttur-Athipattu (88 kms.) is also to be taken up through the new R3i policy of Railways.

(vi) Chennai Port: The port is connected by road to NH-5 (Chennai-Kolkata), NH-4 (Chennai – Bangalore / Hyderabad etc.) and NH-45 (Chennai –Dindugal/ Tiruchirappalli. Apart from national highways the east coast highway connects the city with Puducherry and rest of South India. NHAI has also taken up Ennore-Manali Road improvement Project (EMRIP) costing Rs.600 crores, which involves shore protection works, Ennore expressway, TPP Road, IRR and MOR Road etc. Port is also well connected with the railway network to the southern parts of Tamil Nadu as also to the rest of India. Chennai Port – Maduravoyal 4 Lane Elevated Corridor project has been taken up through the NHDP Phase-VII to be executed under BOT model at a total estimated cost of Rs,1,655 Crore covering a distance of 19 Kms. The majority of the expressway shall be alongside the river Coovum. The elevated corridor shall begin from the Exit/Entry Gate of Chennai Port on the southern end to Maduravoyal connecting NH-4 which leads to the industrial hinterland of Sriperumbudur of Kanchipuram District and further to Bangalore, Hyderabad etc. Unless the above connectivity projects at Ennore and Chennai port are implemented, it will be difficult for evacuation of cargo to be handled at the proposed Chennai Mega container terminal.

(vii) VOC Port (Tuticorin Port): The port has two lane road connectivity through NH-45B, NH-7 and NH-7A. Four laning of the 47.2 kms stretch of NH-7A between Tuticorin and Tirunelvelli and NH-45B are in progress. Port/Marshalling yard is connected to Milavattan junction on the Vanchi maniyachi-Tuticorin section and main line of Southern Railways.

(viii) Cochin Port: Road connectivity to the port from the mainland is through two bridges –one on Mattanchery channel and the other on Emakulam Channel. A link road connects Willingdon Island to NH-47 bypass. Four laning of the 10.40 stretch of NH-47 is under progress. A single rail line which branches off at Emakulam from the main line from Shornur—Trivandrum also serves the port. Action is being taken to provide rail connectivity and National Highway connectivity to the upcoming International Container Transhipment Terminal, which is targeted to serve the hinterland extending to Major Industrial Hubs of India. A 17.2 km long four-lane road that will connect the Container Terminal to three National Highways NH-47 (Setam), NH017 (Mumbai) and (indirectly) to NH-49 (Madurai) has been newly created. The connectivity to the National railway grid is established to facilitate container movement to the North Indian Industrial hubs. An 8.86 km long link line from ICTT to the main rail grid is operational since November 2010. The link will support the formation of a freight corridor for movement of exports from Tamil Nadu and Karnataka in future. In addition to the rail/road linking, an Inland water connectivity is also needed to the terminal in the state of Kerala. The National Waterway (NW3) maintained by the Inland Waterway Authority of India runs in proximity to the Cochin Port. In the wake of the commissioning of ICTT, the Waterway Authority is adding two new terminals near the port to facilitate the movement of Ro-ro barges (Roll on and Roll of) which will enable movement of container traffic from South Kerala through the Inland Waterways. The terminals will also facilitate movement of containers by coastal vessels and river-sea vessels from west coast Non-Major Ports.

(ix) New Mangalore Port: It is located in Karnataka State on the west Coast of India, well connected to the Industrial hubs of Southern India as well as North India via Konkan railway. Road connectivity to the port is provided through NH-48 (Bangalore-Mangalore), NH-17 (Cochin-Goa-Mangalore) and NH-13 (Sholapur-Mangalore). Four laning of NH-17 (Suratkal-Nantur section), NH-48 (Padil-Bantwal section) and a bypass from Nantur junction on NH-17 to Padil junction on NH-48 is in progress. A broad guage railway line connects the port to the southern parts of the country and the Konkan Railway links the port through Mangalore with Mumbai. Limited rail capacity available for Hassan-Mangalore is only 6 rakes/day (4 down and 2 up) and further rail connectivity through new routes like Hubli-Ankola have to be established.

(x) Mormugao Port: The port accounted for about 32% of Iron Ore export of the country (before the ban). Two lane road links from the port to NH-17A through Vasco city is available. Four laning of 18 kms stretch of NH-17B from Verna Junction on NH-17 to Mormugao Port is in progress. Rail connectivity to the port is also available.

(xi) Mumbai Port Trust: The port has Indira dock system with 33 berths on the mainland. The two docks being Prince & Victoria Docks are being used for storage space of off-shore container berths. The port is well connected to other parts of the country through NH-8 (Ahmedabad), NH-3 (Delhi and Kolkata), NH-4 (Bangalore) and NH-17 (Goa/Mangalore), Anik-Panjorpole Link Road to provide access between Mumbai Port and Southern parts of Mumbai, Navi Mumbai on the mainland to the East and Eastern Express Highway is being undertaken. The port is connected to the Indian Railways at Raoli, Junction, Wadala. At present trains to Mumbai Port have to move to Kurla and Wadala on busy suburban section. To address this issue, deposit work by Mumbai Port & Railways for providing third line between Wadala and Kurla is already sanctioned at a cost of Rs. 131 Crore and is targeted to be completed by December 2012. Presently R&R works are in progress.

(xii) Jawaharlal Nehru Port: The port is connected through NH-4B to the Mumbai-Pune Expressway, NH-17 to Mumbai-Goa Highway, SH-54 to the western parts of India. Four laning of NH-4B and SH-54 and construction of a four lane Amra Marg including six lane major bridge across Panvel Creek is also in operation. The port is well connected by rail to

Panvel. A proposal for construction of grade separators through SPV (NHAI, JNPT and State Government) is under active consideration. Similarly, construction of second evacuation road from container gate to CFS / Dronagiri with respect the proposed development of SEZ in the area is also under consideration.

(xiii) Kandla Port: A gateway to the North West India, it accesses a vast hinterland of 1 million sq. kms stretching up to Jammu & Kashmir by meter gauge and broad gauge railway system. The port has two lanes and four land approaches to NH-8A. Four laning of various sections of NH-8A have also been implemented. The port is connected by rail to Mumbai and Delhi via Ahmedabad. The port has metre-gauge connectivity to Palanpur. Gandhidham-Kandla Port is single line section and doubling of Gandhidham-Kandla Port is in progress. Road from NH-8A to Tuna Port will be widened from two lanes to four lanes. Providing railway connectivity to Tuna Port for 10 kms. will be taken up ;through Western Railways as a deposit work.

4.2.4.2 Non- Major Ports

4.2.4.2.1 It is equally important to look at the existing connectivity at non-major ports. Even though there are about 176 Non-major ports across maritime states of which about 60-65 Ports are active ports handling EXIM cargo and rest are mainly fishing harbours. Even out of these 60-65 active non major ports only six enjoy rail connectivity upto the port. Another 8-10 ports have connectivity upto the nearest railway station and will need last mile connectivity to enable evacuation of cargo by rail. Thus there is an urgent need of improving rail connectivity. Even the connectivity by road is a serious bottleneck. As an illustrative case, the details pertaining to rail-road connectivity of non-major ports in Gujarat are given in Table 4C.

Table 4C: Gujarat: Rail Road Connectivity to Non-major Ports

Ports	Road link	Nearest Rail link
Bedi	Connected to NH from Rajkot	Jamnagar Railway Station (7 Kms. from Bedi)
Bhavnagar	Connected with the State Highway	Connected by Broad Gauge (B.G.) Line

Ports	Road link	Nearest Rail link
Dahej	Connected to Bharuch (45 Kms.) and Vadodara (108 Kms.) by road	Bharuch Station
GAPL	Connected to NH network via SH no.50 via Anjar and SH no.6 via Gandhidham	57 km. B.G. rail line from Mundra port to Adipur station provides rail connectivity to National Railway grid
GPPL	Port Pipavav has built a 11-km long 4 land expressway connecting port to NH 8E	Directly connected to hinterland by B.G. rail network of railways
Jafrabad	-	B.G. line available from Rajula which is 22 Kms. away
Jakhau	120 km from Bhuj. Port connected to Jakhau village (12 km away) by road	Nearest Railway station is Malaya
Mandvi	52 kms away from Bhuj town & connected with coastal highway	-
Magdlla	S.H – 2 kms from Port N.H 8 – 15 km away from Port	15 kms away from Magdalla Port (Sachin Yard)
Mundra (Old)	Connected to Gandhidham by road and then by National Highway	B.G. line available from Ganchidham to Adani Port
Navlakhi	Road from port available connecting National Highway at Morbi	Connected by BG railway line via Maliya
Okha	Connected by road to Jamnagar/Porbandar and from there by National Highway (NH)	Connected by Broad Gauge (B.G.) Line
Porbander	Connected by road to Rajkot and from there by National Highway (NH)	Connected by Broad Gauge (B.G.) Line
Simar	Connected with coastal highway by a village road of 8 km	Nearest meter gauge railway line is at Delvada about 20 km
Vansi-Borsi	NH no. 8 is about 35 km from the site	BG rail is at a distance of 13 km at Navsari
Veraval	Connected with Ahmedabad & Coastal highway by road	Narro gauge line in port

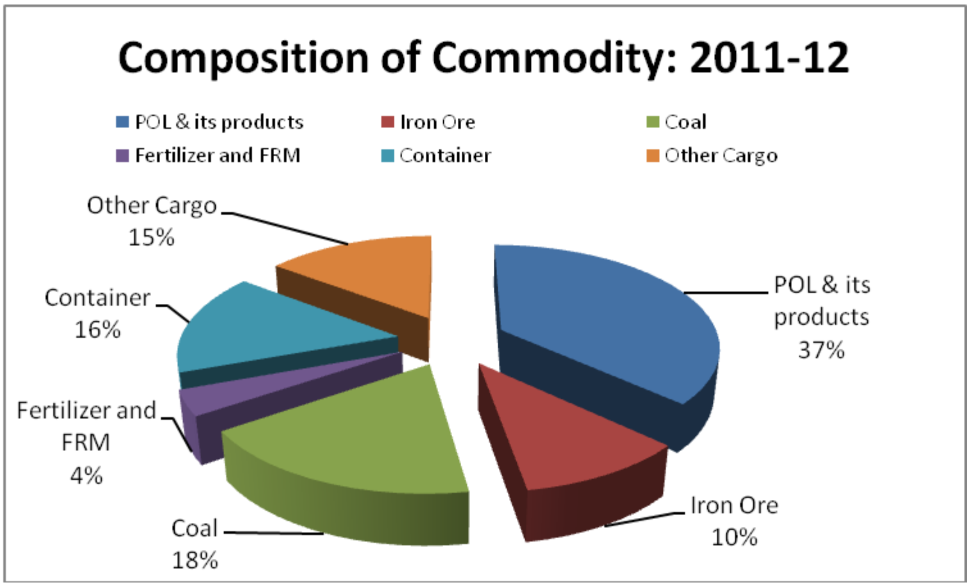
4.2.4.3 Adequacy of connectivity in respect of Non-major ports has been studied on the basis of the detailed information contained in Shipping Ministry's, Maritime Agenda The maritime agenda: 2010 - 2020 identified the number of projects and capacity creation under different category including rail-road connectivity in three phases namely (i) upto 2012, (ii) from 2012 to 2017 and (iii) from 2017 to 2020. The Working Group has assessed the status of Rail Road Connectivity covering Non Major Ports as indicated in the Table 4D.

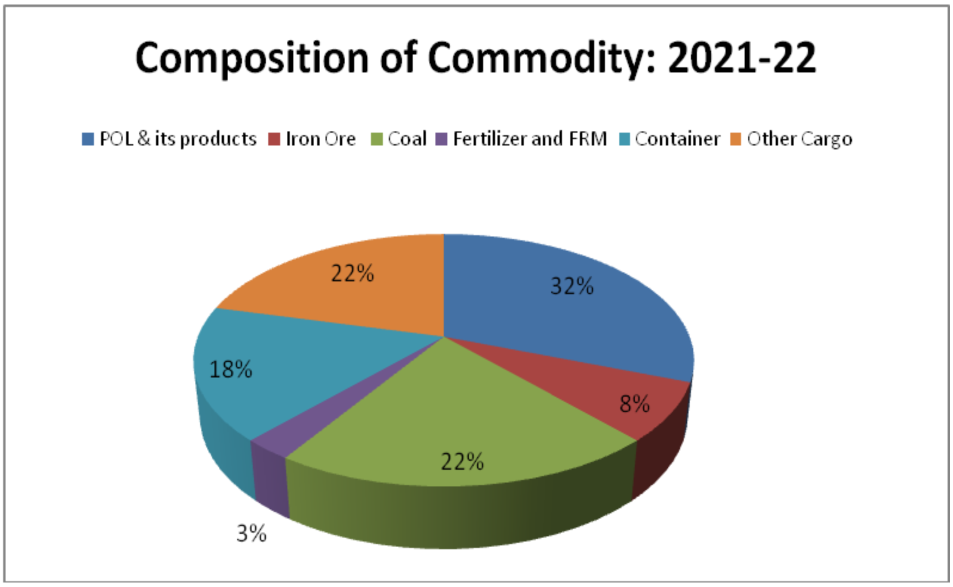
Table 4D: Maritime States (Non Major Ports):Status of Rail Road Connectivity

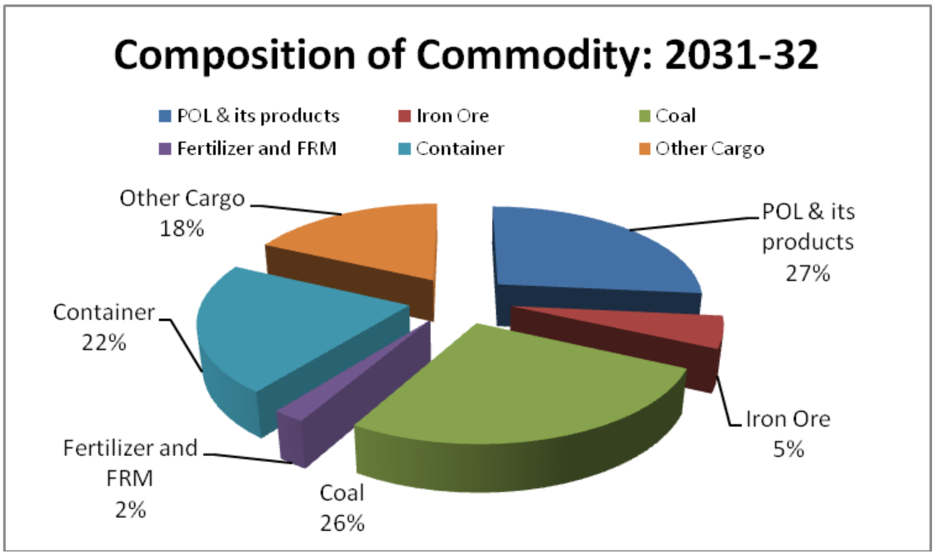
States	**Rail/Road connectivity assessment**	
	Short Term (upto 2015)	**Medium (upto 2015-2020)**
Gujarat	Adequate	Marginally Inadequate
Maharashtra	Inadequate	Inadequate
Goa	Adequate	Marginally Inadequate
Karnataka	Inadequate	Marginally Inadequate
Andhra Pradesh	Adequate	Marginally Inadequate
Tamil Nadu	Adequate	Marginally Inadequate
Kerala	Inadequate	Inadequate
Orissa	Adequate	Inadequate
Pondicherry	Inadequate	Marginally Inadequate

4.2.4.4 In order to assess the hinterland connectivity requirements of various ports up to the terminal year up to 2031-32, the Working Group felt that it is important to analyze the traffic composition likely to be handled at major and non-major ports and also the trends in phases namely (i) upto 2011-12 , (ii) upto 2016-17, (iii) upto 2021-22, (iv) upto 2026-27 and (v) upto 2031-32 is given in Table 5E.

Table 4E: Trend in Cargo Traffic								
Year	**Ports**	**Traffic handled (Million Tonnes)**						
		POL & its products	**Iron Ore**	**Coal**	**Fertilizer and FRM**	**Cont-ainer**	**Other cargo**	**Total**
2011-12	**Major Ports**	179.1	60.7	88.8	20.4	120.2	100.9	560.1
	Non-Major Port	161.1	36.3	78.4	15.7	25.1	34.9	351.5
	All Ports	**340.2**	**97.0**	**167.2**	**36.1**	**146.3**	**135.8**	**911.6**
2016-17	**Major Ports**	218.5	65.6	116.5	22.6	167.5	137.7	728.4
	Non-Major Port	246.6	48.7	146.8	20.5	47.0	67.5	587.0
	All Ports	**465.1**	**124.3**	**263.3**	**43.126**	**214.5**	**205.1**	**1315.4**
2021-22	**All Ports**	565.8	137.2	386.9	50.0	315.2	287.8	1742.8
2026-27	**All Ports**	688.4	151.5	568.4	58.0	463.1	403.6	2332.9
2031-32	**All Ports**	837.6	167.2	835.2	67.2	680.4	566.1	3153.7







4.2.4.5 Completed Rail Connectivity Projects: 1. Haldia (Doubling of Panskura-Haldia section (Phase-I)[Length 14 Km;Cost Rs.26 Cr]; **2** New Mangalore (Aresikere-Hassan-Mangalore rail link)[Length 236 Km;Cost Rs.357 Cr];**3**. Kandla (Gandhidham-Palanpur Gauge Conversion) [Length 313 Km; Cost Rs.550 Cr]; **4**. JNPT (Doubling of Panvel-Jasai section) [Length 28.5 Km; Cost Rs.69 Cr]; **5**. Paradip (Second bridge over Mahanadi) [Length 3Km;Cost Rs.140 Cr]; **6.** Tuticorin (Doubling of Madurai-Dindigul section) [Length 62.06 Km;Cost Rs.126 Cr];**7**. Kandla Port (Bhildi-Samdhari Gauge Conversion) [Length 223Km;Cost Rs.490 Cr]; **8**. Cochin (Vallarpadm-Idapally-New Line) [Length 8.86Km;Cost Rs.246.50 Cr];**9**. Dahej (Gauge conversion of Bharauch-Samni-Dahej) [Length 62.33Km;Cost Rs.200.8 Cr]; **10**. Gangavaram (Connectivity to Vizag); **11.** Dhamra (62 Km to main line).

4.2.4.6 Ongoing Rail Connectivity Projects: 1. Paradip (Haridaspur- Paradip new line)[Length 82 Km;Cost Rs.791.18 Cr]; **2** Mumbai (Dedicated freight line between Wadala and Kurla)[Length5.66 Km;Cost Rs.104 Cr];**3**. Haldia (Doubling of Panskura- Haldia section (Ph-II) Rajgoda to Tamluk (13.5 km) has been sanctioned as Railway Project and from Tamluk to Basulya Sutahata (24.4 km) has been planned on PPP mode) [Length 37.9 Km;Cost Rs.86.91Cr for Rajguda- Tamluk]; **4**. Krishnapattanam (Obulavarpalle-Krishnapattanam new line) [Length 113.12 Km;Cost Rs.732.81 Cr]; **5**. Mormugao (Doubling of Hospet-Vasco Section) [Length 352Km;Cost Rs.2127 Cr];

4.2.4.7 Rail Connectivity Projects under consideration:1. Kolkata (Rail connectivity to proposed jetties at Diamond Harbour); **2** Ennore (Puthur-Atipattu Chord line)[Length 88.3 Km;Cost Rs.446.87 Cr];**3**. Rewas (Rail connectivity to Hamrapur) [Length 24 Km;Cost Rs.464 Cr]; **4**. Dighi (At Indapur) [Length 48 Km;Cost Rs.597 Cr]; **5**. Jaigarh (Connectivity to(a) KRCL (Length 41 KM); (b) Ukshi-Ratnagiri(Length 159Km;Cost Rs.3462 Cr]; **6.** Visakhapatnam (a)Kottavasala-Simhachalam 4th line 16.69 KM Cost Rs 108.81 Cr b)Vizianagram-Kottavasala 3rd line 34.7 KM Cost Rs 194.84 Cr);**7**. New Manglore Port (Hubli-Ankola 167 KM length Cost Rs 337.82 Cr and Harihar via Harpanhalli 65 KM Cost Rs 354.06 KM); **8**. Mundra (Gandhidham-Adipur) [Length 8Km;Cost Rs.27.56 Cr];**9**.Kandla (a.Gandhidham-Kandla 12 Km length & Cost Rs 32.99 Cr; b. Viramgram-Surendranagar 65.26 Km Length and Cost Rs 271.88 Cr. c. Bhidi-Viramgram 157 Km Length and Cost Rs 398.03 Cr)

4.2.4.8 Road Connectivity Projects Completed: 1. JNPT Phase II (Connectivity to SH 54 with a length 14.35 Km and funded by SPV); **2.** Port Connectivity to Mormugao (Connectivity to NH 17 B with a length 13 Km and funded by SPV)**3**.Cochin (Connectivity to NH 47 with a length 10 Km and funded by SPV)**4**. Paradip Port (Connectivity to NH 5A with a length 77 Km and funded by SPV); **5.**JNPT Phase I (Connectivity to NH 4B &4 with a length 30 Km and funded by SPV); **6.** Gandhidham – Samakhiali Package III (Connectivity to NH 8A with a length 16.16 Km and funded by NHAI); **7.** Gandhidham – Samakhiali Package II (Connectivity to NH 8A with a length 22 Km and funded by NHAI); **8.** Gandhidham – Samakhiali Package (Connectivity to NH 8A with a length 18 Km and funded by NHAI);**9**.Vishakapatnam Port (Connectivity to SR with a length 12 Km and funded by SPV)

4.2.4.9 Ongoing Road Connectivity Projects at Major Ports: 1. Haldia Port Connectivity [NH 4]) from Kolaghat to Haldia ;(Length 52.50 Kms Est.Cost Rs 552 Cr) **2.** Chennai-Ennore Port Connectivity;(Length 30 Kms Est.CostRs 600 Cr)**3**. Elevated Road from Gate No.10Chennai Port to Maduravayal on NH 4 under NHDP Phase VII (BOT)(Length 19 Kms Est.Cost Rs1345 Cr)**4**. Tuticorin Port Connectivity [NH 7A];(Length 47.20 Kms Est.Cost Rs 231.20 Cr); **5.** New Manglore Port Connectivity [NH 17,13 &48];(Length 37.50 Kms Est.Cost Rs196.50 Cr)

4.2.4.10 Road Projects being undertaken by NHAI for Minor Ports: 1. Four laning of Gandhidham Mundra Section of NH-8A (Extn) in Gujarat under NHDP III connecting Mundra. Estimated Cost Rs 953.80 Cr to be completed in about 30 months; **2.** Four laning of Maharashtra/Gujarat Border –Surat-Hazira Section of NH-6 in the State of Gujarat under NHDP Ph III to serve Hazira Port Estimated Cost Rs 1509.10 Cr to be completed in about 30 months;**4**. Vijayawada to Machilipatnam on NH-9 in Andhra Pradesh under NHDP Ph III connecting Machilipatnam, Andhra Pradesh Estimated Cost Rs 618 Cr to be completed in about 24 months; **5**. 4-lane connectivity to Dighi & Jaygad Ports in the state of Maharashtra under NHDP Ph under NHDP Ph VII to serve Mundra Port;

4.2.4.11 From the projects of rail and road connectivity as outlined above, it could be seen that all the major ports except Chennai will be having reasonably adequate rail connectivity right upto the port. As regards Chennai, although there is a shift of bulk commodities from Chennai, there is a need for strengthening of rail connectivity for the purpose of loading and evacuation of containers into and from the port since Chennai has the potential to emerge as one of the HUB port for containers on the east coast. There also appear to be high prospects of automobile exports in large volume from Chennai for which efficient rail connectivity is desirable. At Chennai, internal rail connectivity should be harmonized with the proposed improved external connectivity.

4.2.4.12 As regards non-major ports, although few project have been taken up and in the pipeline, they would only serve providing reasonable rail connectivity to the non-major ports like Dehaj, Gangavaram, Dhamra, Mundra, Krishanapatnam, Rewas, Dighi and Jaigad. For the remaining, active operational non-major ports, minimum single line broad gauge rail connectivity upto the port have necessarily to be provided, although some of the ports may have rail head nearby.

4.2.4.13 So far as the road connectivity is concerned, all major ports are having reasonable road connectivity linking to various highway of the country. Special focus need to be made on the reorganization /overhauling of road network of approach roads of Mumbai and Kolkata ports to their linkage NH network. In respect of non-major ports, the existing projects and which are in pipeline would provide reasonable road connectivity to the ports like Mundra, Hazira, Machiliatnam, Dighi and Jaygad. Remaining non-major ports, although may be having skeletal kacha road network to the ports, it is recommended to provide atleast two lane highway quality roads from the respective ports to the nearest NH Network. NHAI, in consultation with state government and private port player, may explore different models for providing the above minimal road connectivity.

4.2.4.14 The above recommendations have been made keeping in view the foreseeable growth of traffic at the ports. However, if any port crosses a threshold limit of 5 million tonnes per annum (other than liquid cargo), action has to be initiated by the port for creating double line BG rail connectivity and also four lane road connectivity. Similarly, if there is rapid, exponential growth at any port due to any reason, the connectivity both of rail and road may have to be upgraded in tune with the requirement.

4.3 Optimization of Rail and Road Connectivity

4.3.1 Ideal Flows Vs. Actual Flows – Distance Advantage

4.3.1.1 It is the commonly assumption that cargo move to the nearest Port from the origin because of distance advantage, but in reality, exporters' preference to a particular port is governed by (a)Efficiency; (b)Freight advantage; (c)Connectivity and ;(d)Port Tariff. It is observed that cargo (like umbrellas) from Kerala are transported to the distant Mumbai instead of Cochin Port. Similarly, cashew cargo which is processed mainly in the parts of Kerala moves over a longer distance to Tuticorin rather through Cochin. Textile cargo units situated in and around Bangalore transport their products in various directions upto Mumbai, New Mangalore, Tuticorin and Cochin despite the longer distances. Tobacco cargo which is processed in Andhra Pradesh moves to Chennai rather than to Visakhapatnam. Thus actual flows do not conform to the ideal flows.

4.3.1.2 As regards container cargo imbalance in the directional movement of export cargo is observed. Container cargo from northern hinterland destined for China and South East Asian countries moves through JNPT and other west coast ports rather than using ports on the East coast resulting in longer sailing distance and higher cost. One of the reasons for this imbalance is lack of adequate/dedicated rail connectivity between production centre and gateway port. Further, freight costs by railways for containers are exorbitant in India and more often, the ocean freight for bringing cargo from Far East and South East Asia are much less than the land freight within the country by rail. Unless proper rationalisation of freight structure is undertaken to make the rate more affordable, shift may not make economic sense. Ideally flows should conform to distance advantage; connectivity plays an important role in making the ideal flows possible logically.

4.3.1.3 Traffic may shift from one port to another if there is a distance advantage of more than 100 Kms, more so, in a situation where many ports are coming up in the neighboring states. Take for example, Iron Ore, Table 4F shows lead distance between the various ports and Bellary – Hospet . It is seen from the Table 4F that Goa Port followed by Ennore and Bellary are the closest ports to the hinterland followed by New Mangalore Port Trust. Further, Goa Port though closest port, connectivity to Goa is through a ghat road with steep grades which gives other ports a competitive advantage.

Table 4F: Lead Distance between Ports in South India and Bellary-Hospet

Ports	Distance in Km.	Ports	Distance in Km
Mormugao	375	Ennore	540
Karwar	484	Krishnapatnam	495
Belekeri	504	Kakinada	790
NMPT	575	Machilipatnam	567
Chennai	500		

4.3.1.4 The railway freight from Bellary to Goa is Rs. 1936 per tonne whereas the rate per tonne for Ennore and Belekeri is Rs. 1750. In case of New Mangalore Port Trust, Karwar and Krishnapatnam the rail freight is Rs. 1850 per tonne. This railway freight charges are to be co-related with port charges while determining the competitive advantages of each port. Table 4G shows consolidated charges per tone for iron ore handling at various ports in the Sothern region.

Table 4G: Consolidated Charges for handling Iron Ore (Rs per Tonne)

NMPT	175.75
Goa	276.0
Ennore	284.6
Krishnapatnam	405.62

4.3.1.5 The distance advantage may not solely determine the cargo flows through the ports. Other factors which may have a bearing are the railway freight rates, cargo handling charges at ports for commodity concerned and rail and road connectivity. The issues related to connectivity or lack of it can be viewed from the perspective of:(i) Capacity in the rail route or road, connecting hinterland to the port and ;(ii)Internal constraints within the port

4.3.1.6 The Working Group recommends that the minimum connectivity out of any port should consist of a double line BG rail track and a four lane road for evacuation of volume of 5 million tonnes per annum and above. Further, internal connectivity should be quantifiable and linked with overall volumes and dwell time. Establishment of actual nomograms will require empirical studies. Constant re-assessment of flow patterns and congestion-points should be institutionalized.

4.3.1.7 Important factor in determining the flow of container cargo is the distribution and location of CFSs and ICDs. It is possible to alter hinterland – ports linkages for ideal flows by altering the CFSs locations. Containerisation has changed the flow pattern of cargo through ports. All the over the world, most of the break-bulk and general cargoes are being containerized apart from some liquid and project cargo also. In the backdrop of containerization, CFS and ICD have emerged key nodes in handling and transportation of cargo within the hinterland. Availability of CFSs and ICDs facilities in a region attracts container cargo. In India, at present, there is surplus capacity in some of the CFSs clusters at Mundra, Kandla , JNPT and Chennai. There is deficit capacity at the remaining clusters in the eastern ports to cater to projected container traffic. Of all the regions, the container traffic handled at ICDs/CFSs in northern region (including north central region) is predominant at 54%.Region wise analysis of ICDs reflects::

i. Northern region and north central region (J & K, Punjab, Haryana , Delhi, Uttarakhand, Himachal Pradesh, etc). The region has highest ICD container volume. Major cargo centers of this region are Amritsar, Jalandhar, Ludhiana, Panipat, Delhi, Dadri. Top two ICDs in the country namely Tughlakabad (Delhi) and Dhandarikalan(Ludhiana) are in this region. Long lead distances of cargo generating centres in this region generate high container volumes in ICDs.
ii. The second highest volumes are observed in the southern region. The major cargo centres in this region are Bangalore, Chennai, Coimbatore, Madurai and Tuticorin. ICDs at Bangalore and Chennai handle large volumes. Though the cargo centres in

this region are close to gateway ports, extensive rail network is one of the reasons for high container volumes at ICDs.

iii. Eastern and Central regions have very low ICD movement , reason being that States in this region (Uttar Pradesh, Madhya Pradesh, Bihar and West Bengal) are primarily agricultural states which do not lend to container based movement.

4.3.1.8 Hence, the policy of setting up of CFS and ICDs in India may also need a constant review so as to ensure balanced distribution of CFSs and ICDs within different regions and connected to various ports and also to ensure optimal connectivity to ports from the originating centres through these nodes. Allocation of commodities to certain specific ports is also a means of achieving optimal results

4.3.2. Optimal Modal Shares in Port Connectivity

4.3.2.1 Port traffic within India is carried largely by railways and road transport, with pipelines carrying some crude oil and petroleum products. Alternative modes such as inland waterways have remained largely undeveloped and the situation is unlikely to change substantially in the medium term. The present mode share of port cargo, based on the tonnage transported by a particular mode, is provided in Table 4H. These mode share estimates are based on some assumptions on commodity-wise optimal mode of transport, on the geographical features of the respective regions, certain cargo characteristics, and the distances traveled from the hinterland. For instance, cargo such as coal and iron ore would preferably be transported by railways unless alternative arrangements such as conveyors or pipelines are available. The estimates suggest that while the railways should have carried 34 percent of port traffic, it actually moved only 24 percent. Roads by contrast presently carry 36 percent of the traffic as compared with the 22 percent they should ideally carry, given in the Table 4H.

Table 4H: Transport Modal Share in evacuation of Port Cargo

Present Mode	Share % (2007)	Optimal Mode Share %
Railways	24	34
Roads	36	22
Pipeline	30	44
Other including inland waterways, conveyers etc.	10	

Source World Bank Report 2007

4. 3.2.2 Modal shares at various transport modes in evacuation of cargo at major ports during 2010-11 are given in Table 4I.

Table 4I: Transport Modal Share in evacuation of Cargo at Major Ports

Sr. No.	Name of Port	Mode	Traffic (in lakh Tones)	Percentage of traffic			
				Rail & Conveyor if any	Road	IWT	Pipeline
1.	Kolkata	Import Export	72.58 52.82	5.38 1.55	63.09 79.53	11.15 15.52	20.37 3.40
2.	Haldia	Import Export	232.57 117.48	34.54 39.53	15.34 44.09	- 2.04	50.03 14.33
3.	Paradip	Import Export	374.50 205.70	48.5 93.0	15.5 4.0	- -	36.0 3.0
4.	Visakhapatnam	Import Export	33.34 29.13	52.0 71.0	14.0 14.0	- -	34.0 15.0
5.	Ennore	Import & Export	11.01	85.0	9.5	-	5.5
6.	Chennai	Import Export	40.33 21.14	17.5 15.9	49.5 75.0	- -	33.0 9.1
7.	Tuticorin	Import Export	183.90 73.30	35.9 -	59.7 100.0	- -	4.4
8.	New Mangalore	Import & Export	315.50	9.0	16.0	-	75.0
9.	Mormugao	Import Export	89.20 411.00	70.0 1.0	12.0 1.0	- 98.0	18.0
10.	Mumbai	Import Export	367.55 178.30	6.63 0.22	26.63 6.83	19.13 1.37	47.60 91.58
11.	JN Port	Import Export	319.94 313.88	22.19 18.92	67.42 66.81	1.71 1.84	8.67 12.42
12.	Kandla	Import Export	612.41 206.39	16.0 11.0	11.0 36.0	- -	73.0 53.0

4.3.2.3 Based on the analysis, the Indicative mode of evacuation/transportation for respective cargo group, recommended by the Working Group is given in Table 4J.

Table 4J: Indicative Mode of evacuation/Transportation in evacuation of Cargo at Major Ports		
Cargo Group	**Moved by**	
Crude Oil	Pipeline	100%
POL	Railway	25%
	Road	25%
	Pipeline	50%
LPG	Railway	50%
	Road	50%
LNG	Pipeline	100%
Thermal Coal		
(Loading Port)	Railway	100%
(Unloading Port)	Conveyor	80%
	Railway	20%
Coking Coal	Railway	100%
Iron Ore		
Mormugao	IWT	80%
	Railway	20%
New Mangalore	Pipeline	100%
Tamil Nadu	Railway	100%
Andhra Pradesh	Railway	100%
Orissa, W.B.	Railway	100%
Food Grain	Railway	70%
	Road	30%
Fertilizer Raw Material	Railway	30%
	Road	30%
	IWT	15%
	Conveyor	15%
Other Dry Bulk	Railway	30%
	Road	70%
Other Liquid Bulk	Pipeline	20%
	Railway	20%
	Road	60%
Containers (Share of Railways increases, When traffic or distance increases.)	Railway	45%
	Road	55%

4.4 Road Map for Future

4.4.1 Dedicated Freight Corridors (DFC)

4.4.1.1 The Ministry of Railways has undertaken a construction of dedicated freight DFC between Delhi and Mumbai. It will be a high speed rail corridor with multiple linkages with feeder lines. It stretches over 1483 Kms in length, covering 6 states of India. DFC will help to alleviate congestion on Delhi-Mumbai Corridor considerably. It is critical to the hinterland connectivity of the Mumbai and Gujarat Port clusters that serve the large share of India's Ports traffic. The focus of the DFC is to ensure high impact developments within 150 Km distance on either side of alignment of DFC. DFC should be completed at the earliest preferably by the end of 12th Five Year Plan and should extend upto JNPT. Feeder lines to DFC from the ports need to be planned/carried out by Railways to complement the capacity and efficiency of DFC. The second DFC is between Ludhiana and Dankuni. It is expected to provide connectivity mainly for the traffic stream of coal to the power houses although later on connectivity to Kolkata port is also a possibility. There are four more DFCs planned between Kolkata – Mumbai, Chennai – Kolkata, Delhi – Chennai and Goa – Chennai.

4.4.2 Backbone concept for Containers

4.4.2.1 With respect to the rail network, southern ports need to have well developed rail corridors to aid in the container movement from the northern and eastern Ports of India to get transshipped through these Ports. For the future needs, especially to further develop northern hinterland, sufficient capacity is needed. The development of southern ports, as entry gate for the backbone of India needs a high speed connection on rail with sufficient capacity to bring the containers within a fixed time to the destination ports as shown in the following picture:-

Business Plan for Tuticorin Port Trust

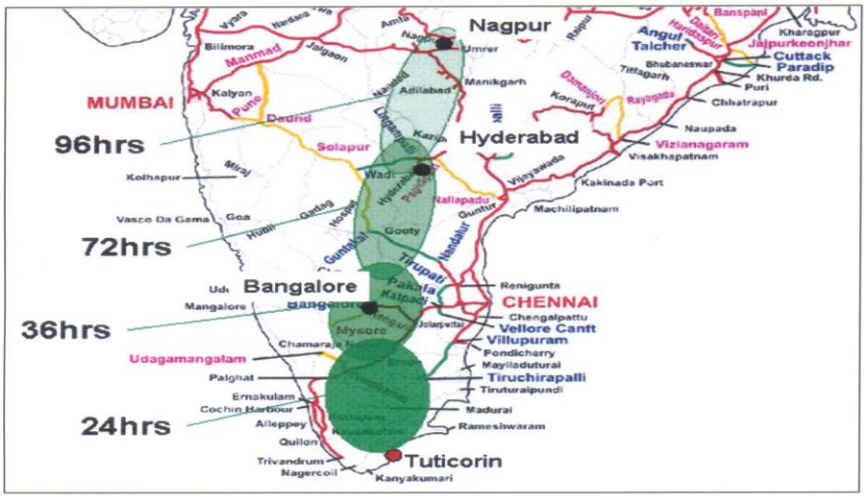


Figure 39: Backbone of India

By shifting 20% only of the forecasted volume to the rail it will create about 20 trains per day and even a rail market share of only 10% will create 10 additional trains in the year 2027_28.

	Total EXIM volume 2027	Railway share	Average load factor of trains	Rakes per year	Rakes per week	Rakes per day
	million TEU / tonnes	*%*	*TEU*	*-*	*52 weeks*	*7 days*
Container	2,600,000	20%	100	5,200	100.0	14.3
Bulk	20,700,000	10%	3000	690	13.3	1.9
Sum				5,890	113.3	16.2

Table 51: Future expected traffic on rail generated by the Port.

TransCare. We change logistics

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4.4.2.2 Port of V.O. Chidambaranar (formerly Tuticorin Port) – by shifting 20% of the forecast volume to the rail, will create about 20 trains per day and even a rail market share of 10% will create 10 additional trains in the year 2027-28. 20% rail market share will already reach the maximum capacity of the Tuticorin-Tirunelveli Link including the existing traffic on this track, but even the link onwards north has to be improved regarding capacity as it is running completely out of capacity soon. The current capacity is only 25 trains per day and direction and is already fully utilized between Madurai and Didingul. Therefore especially the link Madurai – Dindigul has to be improved regarding the capacity, because it will carry the major load of all container traffic. Furthermore, the link from Tuticorin to Madurai and further to Bangalore has to be electrified or diesel traction universalized , to cut the transfer times for changing the locomotives at Erode and Salem. For the future development of Tuticorin as the entry gate to Central and North India as well, electrification of rail link to Hyderabad is recommended. Furthermore, there is a big potential for the Ports in South India, especially Cochin and Tuticorin and upcoming container Ports in Kolachel, Vizhinjam, Kattupalli and Krailical to consolidate their volumes at a point like Erode, where all the links from these Ports come together. It is recommended to develop a intermodal hinterland terminal at Erode together with partners within the liberalised railway market to realise the above mentioned backbone of India to serve from South to Central India – Southern Ports to Nagpur. Depending upon the volume, such intermodal hinterland terminals can be developed at different joints of the backbone.

4.4.2.3 Furthermore, strategic partnership of competitive ports can be done to consolidate the volumes from South Indian ports .Shuttle services can be created between Central and Northern India with high frequencies and huge volumes. As time is money, a shuttle network on a daily basis gives these Southern Ports an opportunity to attract volumes even in Central and North India.

4.4.3 Inland water transport – Coastal Shipping

4.4.3.1 National waterways provide a cost effective mode of transportation. However, its potential has not been realized so far due lack of connectivity of this mode with rail, road and the ports. As of now, there are five National Waterways(NWs)

4.4.3.2 The Ganga-Bhagirathi-Hooghly river system (NW-1) and the Brahmaputra (NW-2) are linked by Indo-Bangladesh protocol route via Sunderbans and Meghna (total 2258 km) and provide hinterland connectivity to the major ports of Kolkata and Haldia. Similarly, the East coast canal and Hijili tidal canal alongwith the Brahmani river (NH-5) provides 588 kms hinterland connectivity to the ports of Kakinada, Krishnapatnam and Ennore. The West coast canal system, (NW-3)-205 km connects major port of Kochi and also the ports of Neendakara, Kayamkulam and Munambam. The Mandovi, the Zuari rivers along with Cumberjua canal (122 m) are connected with the major port of Murmagao and the port of Panjim. The backwater system of Mumbai-Thane-Ulhas waterway (142 km) provides hinterland connectivity to major ports of Mumbai and JNPT. Thus, a vast network of waterway has the potential to provide viable IWT connectivity at many ports of India.

4.4.3.3 Given the near saturation of rail –road connectivity to Ports in particular, it is imperative to explore and augment the connectivity of ports through inland water mode wherever feasible.IWAI is setting up intermodal terminals at major cargo centres on all national waterways. Major terminals at Patna and Pandu have been set up and similar terminals are planned/under construction at Kolkata, Varanasi, Allahabad in NW-1, Dhubri and Jogighkopa in NW-2, 8 terminals in NW-3, 16 Terminals in NW-4 and 7 terminals in NW-5. Likewise terminals are set up in Goa and Mumbai waterways by the respective State Government. There is need to link all IWT terminals with nearest NH by link roads for which appropriate junctions with NW are to be provided by NHAI. Further, permission for use of service roads as link loads/use of NH land for construction of link roads needs to be granted for proper road linkages with NH.

4.5 Quantification of connectivity index for each port

4.5.1 The Working Group recommends that a suitable index should be evolved representing the connectivity of the port through a single number. The connectivity index can be conceptualized as:

$$C = W_1 * (R_a / R_c) + W_2 * (L_a / L_c)$$

Where W_1 = Weight age to Road Traffic

W_2 = Weightage to Rail Traffic

R_a = Traffic handled by Road

R_c = Capacity of the Road infrastructure at the Port

L_a = Traffic handled by Rail

L_c = Capacity of the Rail Infrastructure at the Port

The weightages have to be decided for individual port depending upon the type of commodity mix and the pattern of lead to the hinterland. General guidelines for fixing the weightages may be laid down by the Ministry.

4.6 Measures for evaluation of connectivity with reference to best in the World

4.6.1 The Working Group recommends that as the status of port connectivity is essentially dynamic as developments take place continuously in the industrial activity in the hinterland, market forces and technology improvements, there must be a mechanism of periodical review of the overall performance followed by an exercise of comparing with the best in the world.

4.7 Conclusions and Recommendations

1. The growth of port traffic is expected to be high in coal and containers.
2. Every port must have a two-lane road as the minimum connectivity.

Where rail able cargo is handled, the requirement is:

A two lane road and a single line rail connection up to a level of 5 million tonnes per annum. It should be improved to ‘double line’ rail connectivity and four-lane road connectivity when the traffic handled crosses this threshold of 5 Million Tonnes per annum.

3. Connectivity within the port system should also receive more attention than at present.
4. The Railways must finalize their revised policy for attracting private investment as quickly as possible. PPP investments and state govt. participation are to be facilitated.
5. The present situation in respect of connectivity is grossly inadequate for non-major ports. Massive investments are needed.
6. Quantification of connectivity through an “index” should be done and inter-se prioritization of investments should be guided by it.
7. Allocation of certain ports for predominantly handling certain commodities should be done so as to optimize hinterland-port linkages and flows. Backbone of CFS/ ICD nodes should be developed as an integrated plan. DFCs should be well connected through feeder routes.
8. Inland Water Transport potential should be exploited better.

Chapter 5: Water Transport Statistics

5.1 Timely availability of Water Transport statistics is vital for monitoring of trends in the economy, performance of the water Transport sector and policy formulation. Water Transport Statistics includes the following:

(i) Port Statistics

(ii) Shipping, Ship Building and Ship Repair Statistics

(iii) Inland Water Transport Statistics

Transport Research Wing, Ministry of Road Transport and Highways is the nodal agency for collection, compilation, dissemination and analysis of data on water Transport Statistics.

5.2 Port Statistics

5.2.1 India has a coastline of 7517 km with 12 Major Ports and 176 notified Non-major Ports along the coastline and Islands. Major Ports are the ports which are administered by the Union Government, while Non-major Ports are administered by the State Governments**.**

5.2.2 **Major Port's statistics** are being published by Major Ports in their Administrative Reports. These reports, as per statutory requirement, are placed in the Parliament. Non-Major Port Statistics in respect of states are collected, compiled and published by respective State Directorates of Ports.

5.2.3 The data on port statistics is disseminated through the annual publication titled 'Basic Port Statistics (BPS)' and bi-annual update on Indian Port Sector, which provides data/information on the latest developments in the Indian Port Sector

5.2.4 Over the years the type of cargo being handled has undergone structural change, with the container traffic gaining in importance. Last one and half decade has seen growing participation of the private sector in port sector leading to change in the operating environment. In order to understand the changes, it was felt that new parameters and indicators for monitoring policy effects need to be identified for data collection. The Ministry of Shipping had set up a **Working Group under the Chairmanship of Adviser (Transport Research) for Strengthening of Major Port Statistics** In May 2009**.** The Working Group has submitted its report in March 2011. Main recommendations/suggestions of the working Group are:

(i) The concept of cargo handled and Turn Round Tiime and its various components have been rationalised to reflect true picture and to enable inter – port comparisons.
(ii) Dwell Time of cargo/ container for export and import cargo has been defined.
(iii) For uniform collection and presentation of Major Port statistics, certain changes in procedures/methods have been suggested.
(iv) To measure the dynamics of the port service sector, short term indicators are required. The three port service indices, namely Index of Service Production (ISP), Consumer Service Prices Index (CSPI) and Producers Price Index(PPI) have been recommended to be compiled annually.
(v) Measures for improving quality of Major ports have been recommended.

5.2.5 **Non-major Ports** are compiling Cargo traffic data. Periodicity of cargo traffic data available for policy and planning purpose from all Maritime States/UTs is at half yearly interval i.e. for the period ending 30th September and 31st March. The data is available for important commodities only. Some of the States take a long time in compilation of detailed cargo traffic and other non-major port data for the publication 'Basic Port Statistics'. This inevitably delays compilation of all India aggregates and subsequent dissemination to Public.

5.2.6 In order to comprehensively monitor the trend in cargo handled by Indian ports, it is imperative that all Maritime States/UTs put in place a mechanism to compile and disseminate monthly cargo traffic data, particularly for non-major ports handling more than 5 million Tonnes per annum.

5.2.7 The following data gaps in Port's statistics exist.
(i) Data on countrywise break-up of Origin and destination-wise of cargo is frequently asked by researchers. Shipping lines/companies generally provide information on the port of country from where the cargo is loaded or to where the cargo is to be discharged and not the actual country from where the cargo originated or is destined to.
(ii) Container cargo is fastest growing traffic at Major ports. However, the commoditywise data handled in containers is not being maintained by major ports.

5.2.8 Ports are in the process of implementing Port Community System (PCS) which is intended to integrate the electronic flow of trade related document/information and function as the centralized hub for the ports of India and other stakeholders like Shipping

Lines/Agents, Surveyors, Stevedores, Banks, Container Freight Stations, Customs House agents, Importers, Exporters, Railways/CONCOR, Government regulatory agencies, etc. for exchanging electronic messages in secure manner. One of the objectives of the PCS is data repository for research and analysis. With the implementation of PCS, the it may be possible to fulfil the above data gaps.

5.3 Shipping Statistics

5.3.1 The country's maritime sector has witnessed a steady growth in the number of Indian registered vessels. These have increased from a level of 418 vessels in1990 to 549 in the year 2000 and further to 1050 vessels as on 31.01.2011. These 1050 Indian vessels have 10.38 million Gross Registered Tonnage (GRT). Out of these 1050 vessels, 702 vessels were engaged in coastal trade and the remaining 348 vessels were deployed for overseas trade. However, in terms of GRT, the share of Ocean going vessels and coastal vessels was 90.3% and 9.7% respectively of total GRT.

5.3.2 Data on shipping sector disseminated through its two annual publications viz;

(i) Indian Shipping Statistics

(ii) Statistics of India's Ship- Building & Ship Repairing Industry

5.3.3 The National Statistical Commission set up by Government of India in its report in 2000 had identified following important data gaps.

(i) Financial performance indicators of private shipping companies.

(ii) Operational indicators (voyages, cargo, capacity or space utilization).

(iii) Freight rates for selected Indian Import and export commodities for all shipping companies.

(iv) Safety Statistics.

(v) Environment pollution caused by shipping Industry

5.3.4 The National Statistical Commission had recommended that a mechanism should be evolved by the Ministry of Shipping to collect data from individual shipping companies which own one on two vessels in most cases. The TRW had asked data on financial performance from 60 shipping companies. However most of the companies are small and unlisted and therefore information on financial/operational performance is not readily accessible. The Working Group is of the view that TRW in collaboration with Directorate General of Shipping and Indian National Ship Owners Association (INSA) may explore ways to obtain and publish data not only on Financial/Operational Indicators, Safety statistics and environmental pollution caused by shipping industry of at least listed companies. Freight rates are in the nature of commercial information which varies from day to day and is acquired by shippers and is subject to negotiation. It may not be easy for a non user/non shipper like TRW to access accurate information. Besides, relying on a single source agency like Shipping Corporation of India may not be a representative rate as it may be sector/route specific.

Statistics of India's Ship- Building & Ship Repairing Industry

5.3.5 Ship Building Industry is a technology, skill and material intensive assembly operation. It draws upon a large number of services and utilities. The end product is a high value floating asset. The Working Group suggests the following to overcome data short comings in ship building and ship repair activities.

(i) Ship order book data presently published may be further classified into Indigenous and Export orders.

(ii) Complete coverage of private sector companies engaged ship building and repair activities may be ensured. This would require a mechanism to regularly update the list of private ship builders and ship repair companies in India.

5.4 Inland Water Transport Statistics

5.4.1 Inland Water Transport (IWT) is a cost effective fuel efficient and environment friendly mode, specially for transportation of bulk Cargo, hazardous goods so vital for industrial development. Apart from the non-availability of timely data on inland water statistics, particularly from states, there are data gaps in IWT statistics :

(i) IWAI is providing Cargo statistics for vessels which are registered and are availing the facilities of IWAI on National Waterways. There are several small unregistered vessels/ boats (country crafts) which carry cargo and do not avail facilities of IWAI infrastructure. The cargo carried by those vessels/boats is not at all being captured. There is a need to carry out periodic survey (may be once in five years) to assess the Cargo Carried by such vessels on National Waterways.

(ii) Many of the State Governments are unable to maintain the data/information on Inland Water Transport due to lack of scheduled/systematic records on Freight/Passenger operations on their waterways. Consequently, the data on IWT at all India level lacks full coverage.

(iii) The data also need to be collected on number of people trained by States to operate mechanised vessels.

5.4.2 The Working Group suggests that states which have inland water transport activity and are not providing data should put in place an institutional mechanism to regularly collect data on IWT activities at state level.

5.5 Improving Quality of Port, Shipping And Inland Water Transport Statistics

5.5.1 The Working Group recommends the following to improve quality of Water Transport Statistics:

(i) Periodic review of Water Transport statistics is required to assess the system and identity the possible changes required for meeting the user needs. It is suggested that such review of various sectors of Water Transport Statistics be undertaken once in five years.

(ii) At present, no system for training and sharing of experiences in respect of Water Transport statistics exist. Training programme/workshops for officials/staff involved in compiling Water Transport statistics, particularly Port statistics may be organised. The workshops should cover statistical concepts, definitions and issues of compilation, processing and Total Quality Management .

(iii) The annual publication should be brought out in the year following end of the calendar/financial year. Bi-annual publication should be brought out within the three months i.e. in June for the period ending 31st March and December for the period ending September

(iv) TRW may provide the metadata for water transport statistics in the form of a manual on the website of Ministry of Shipping.

(v) All the regular publications on Ports, Shipping and Inland Waterways of TRW should be put on the website of Ministry of Shipping.

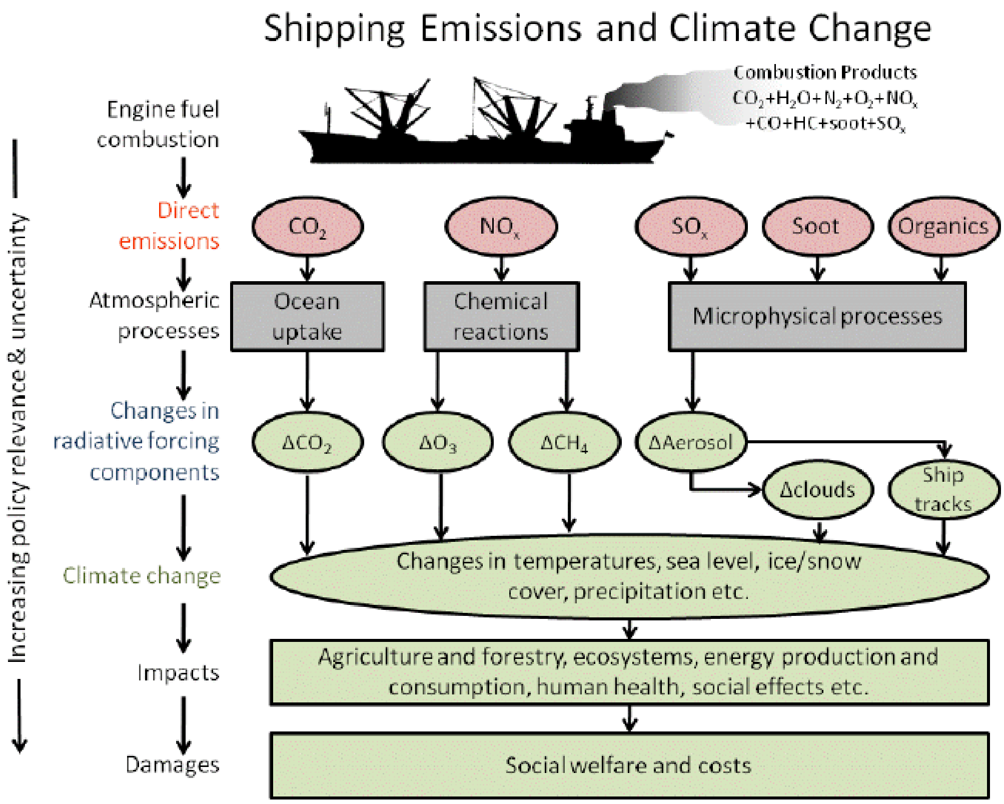
(vi) Concurrent audit of statistical activities is necessary for early detection of errors and mistakes during the progress of work, and their rectification in time is essentially an internal activity of the primary data compiling agency. It is suggested that assessment of quality of the data produced by the primary source agencies may be carried out through statistical audit by officers authorized by the Ministry of Shipping.

Chapter 6: R & D and Technology Evolution in Shipping

6.1 Introduction

6.1.1 The maritime sector, a key generator of global trade and economic activities, is shaped by factors which include political, economic, social, technological, financial, environmental and international/domestic laws and conventions. In addition to these, concerns over carbon emissions have emerged as a key driver that is reshaping the way industry players think, plan, invest and operate.

6.1.2 For many years, shipping has prided itself in the efficiency of its cargo carriage, and there is no doubt that ships are still the most efficient means of carriage, at least measured in terms of CO2 emission per ton mile of cargo moved. Over the years, shipping is becoming increasingly efficient, not least due to the "economies of scale" which has led to larger ships.



6.1.3 Irrespective of this, shipping has to contribute in global effort to fight climate change by reducing GHG emission despite the fact that these emissions as of now are not subject to any regulation. Shipping at a global level is responsible for some 1,046 million tones or 3.3% of global CO_2 emissions in 2007 (2.7% from ships on international trade and 0.6% from

Domestic and fishing vessels) and that emissions are expected to increase with increased demand for sea transportation.

6.1.4 Considering the fact that the Indian seaborne trade could increase by a factor of 3.5 by 2020, would require augmentation of Indian shipping tonnage. Accordingly, the Indian shipping (Owned Fleet) should aspire to reach a level of 30 million GT by 2020. (Source: Maritime Agenda 2010-20) *The Coastal shipping is also likely to improve further from the present level of 10% of the total tonnage, considering the various initiatives put in place.* *Considering a conservative estimate of achieving a GT of 14.71 million tons (nearly 50% of target) and assuming that the coastal tonnage is likely to increase to 15% of the total tonnage by 2020.*

6.1.5 There is growing pressure for the shipping sector to clean up its act amid growing demand for maritime-related services such as shipping, port operations, shipbuilding, ship repairing and host of other ancillary services. As demand for services in the maritime sector grows in line with growing global seaborne trade, offshore oil and gas activities and other economic activities requiring ships, ports and other maritime components, emissions from the maritime sector is expected to be on the rise. Therefore, steps for effective climate action in maritime transport as well as support for efficient maritime transport services are necessary in support of sustainable development and enhanced trade competitiveness of developing countries.

6.1.6 Estimation on current consumptions and carbon emissions are based on the data from IRS and DGS database and the data published in Lloyds Register Fairplay were used for the estimation.

Ship Emissions and Fuel Consumption by Indian Ships		
YEAR	**2009**	**2010**
Total GT in million	9.665	9.5865
Total No of Ships	1344.5	1366.5
Total Co2 / Year in Mill Tonnes	9.814	9.8445
Total Fuel Consumption/Year in Mill Tonnes	3.1355	3.145

6.2 Identified Areas of R&D and Technologies for Low Carbon Sustainable Shipping

6.2.1 While Shipping has done well to start reducing its emissions levels, immense challenges remain in rallying industry players to voluntarily clean up their acts and meet the cost of complying with regulation. New technologies and innovation have to be indigenously developed and introduced to further reduce GHG from shipping operations, and the resources for R&D and compliance must be provided.

6.2.2 From India's perspective, there may be concerns about the cost implications of the various mitigation measures and, where applicable, the capacity to adopt and implement technology-based measures. Increased costs are likely to exert additional pressure on the Indian maritime industry and, by extension, on transport costs, which are already disproportionately high in India and entail implications for trade competitiveness.

6.2.3 It is therefore imperative that research and development work be undertaken in developing technologies for shipboard GHG reduction for marketing not only to Indian shipping fleet but international shipping fleet. Government must put in place a system for providing easy financial and administrative support to entrepreneurs and R & D organizations.

6.2.4 With a view to reduce carbon space in atmosphere, market based measures may come into force in international shipping. In that scenario for Indian shipping fleet to remain competitive, it is essential that GHG reduction technologies be made indigenously available at reasonable cost otherwise Indian shipping industry would become uncompetitive by having to import technologies from developed world at exorbitant cost to make ships fuel efficient or run energy inefficient ships.

6.2.5 The areas of R & D could be development and use of alternative fuels like bio-fuel. There is an urgent need to use LNG as fuel of Ships and should be supported by the Govt. LNG as fuel is cheaper than liquid fossil fuel and given cleaner emission apart from less GHG emission. However, due to lack of good distribution and bunkering facilities LNG has remained a very expensive fuel currently. If an infrastructure for distribution and bunkering facility around the coast is provided as has been done in Baltic, the cost of operating coastal fleet in India will become cheaper with consequential cleaner emission. School of Maritime Design and Research in Indian is taking initiative in use of

LNG as fuel on ship and the same should be supported. Also adequate steps be taken to have good distribution and bunkering facilities around the coast. In Scandinavian countries, Japan etc. currently research is in progress for development and use of fuel cells, Kite sail, air bubble technologies etc. It is imperative that seminars be held at regular basis in various forums to encourage innovation and R & D.

6.2.6 Shipyards need to be encouraged to design and build ships in compliance with IMO's Energy Efficiency Design Index (EEDI) and Ship owners encouraged to operate ships as per Ship Energy Efficiency Management Plan (SEEMP).

6.2.7 IMO having approved regulations for Technical and Operational Measures for reducing GHG emission from ships in July 2011 at MEPC 62 will also in all probability approve Market Based Measures (MBMs) for further reducing GHG emission from ships in the next few years. Indian National Ship Owners has carried out an impact assessment on ship operating cost including cost implications on older vessels. The study has found bunker levy to be cheapest form of MBM. The regulatory development process needs to be closely monitored and influenced at IMO to protect our national interest.

6.2.8 India is predominantly dependent on the imported LNG and even the reception facility for this LNG is very sparse. India being in the tropical zone, extra emphasis needs to given to research on the cryogenic systems. Though the LNG industry has been operating at highest standards of safety for several decades. Extra safety precautions / security arrangements need to be devised to make the LNG Bunkering facilities more fool proof. This is attributed to the fact, that even a single mishap can potentially pose a threat to the whole bunkering facility / port.

6.2.9 The Government and Shipping fraternity should encourage on R&D for development and use of fuel cell, kite sail, air bubble technologies etc. in reducing fuel consumption. It is suggested that stakeholders should organize seminars/workshops at regular basis to encourage innovations and R&D.

6.2.10 In order to achieve the objective of sustainable shipping and to achieve our country's effort to address the climate change, there is **a need to provide government funding to support energy efficiency initiatives of stake-holders.**

6.2.11 There would be a huge requirement of ship energy efficiency enhancement technologies including use of alternative sources of energy. **Appropriate funding facilities may be provided by Ministry of Science & Technology to encourage entrepreneurs willing to develop new energy efficient designs and technologies through research and development.** Among others, European Union has established such financial instrument for the environment. European Union funding instrument LIFE+ is intended to finance and co-finance projects that contribute to EU's efforts to address the climate change. Accordingly, financing can be made available for best practice pilot projects in areas such as climate adaptation techniques, as well as energy efficiency initiatives. With such financing, our entrepreneurs would be able to sell technologies to international market.The Indian oil Refineries should be well aware of low sulphur bunker fuel and equipped with producing the same. Otherwise in future demand of bunker fuel being sourced from India may be in the decline.

6.2.12 There is also a need to ratify the Ballast water convention, Ship recycling and Antifouling system convention in order to maintain the uninterrupted overseas trade and safeguard our coastal waters. There is also an urgent need to complete base line study of remaining ports in India and to establish at least two ballast water sample testing facilities one in each coast urgently. Also Government should actively promote research in developing ballast water treatment technologies so that when the Ballast Water Convention comes in to force globally, we will have indigenous technology at our disposal instead of totally dependent on foreign technologies.

6.2.13 The Government may also consider the proposal to carry out the study for designation of the Lakshadweep Island, Andaman & Nicobar Island & any other area which qualifies for Particularly Sensitive Sea Area (PSSA). It is also proposed for designation of Emission Control Area (ECA) for specific portions to Indian coastal waters, for the control of Nitrogen oxide (NOX), Sulphur oxide (SOX) and particulate matter (P.M.) emissions.

6.2.13 It is crucial to provide training for seafarers on enhancing energy efficiency of Ships. Most importantly, there has to be a mindset shift among those in the industry to move away from the mentality of maintaining the status quo to a proactive stance to do their part to reduce carbon emission.

Chapter 7: IT Investments & Interface

7.1 Transport system comprises of a number of distinct modes and services. Transport system is an integral part of supply chain, implementation of IT is of vital importance. All these changes require the various links in the supply chain to provide on line information, facility**.** Changes in the port industry are underway because of implementation of Port Community System at Indian Ports. Similarly, change in the shipping industry is also underway. Leading carriers, consolidators, freight forwarders, and agents around the globe have introduced electronic commerce to serve their customers better.

7.2 Requirements of Implementation of IT

7.2.1 Transactions in the Indian Port Community are still paper based. Though some of the individual members of the community have computerized their internal operations, it is difficult for them to transfer the data electronically and the data transfer, getting status updates from or transacting business with other members of the community take place manually resulting in re-entry of data into their internal systems manually. These activities slow down the flow of information and are error- prone, and adversely affect service levels - all soft costs, very hard to detect and control. As the dominant players (likes Port/shipping industry and Customs),begin to adopt electronic exchange of data and e-commerce practices, manual steps are being eliminated one by one and handled by automated systems and transmitted by EDI messages.

7.3 Information Systems at Ports – a model

7.3.1Ports are vital links in the transport chain between sea and in land routes. Port is, therefore, required to interface with the Shipping Agents, the representative of ship-owners and with the Custom House Agents (CHAs) or Forwarding Agents, who manage the cargo on behalf of importers and exporters. The port has also to work in close association with the Customs, who have statutory control to permit import and export of cargo and with banks for funds flow.

7.3.2 Ports deal with a wide range of activities like movement of ships, passengers, cargo/container through different modes of transport, the loading and unloading of ship and interaction/clearance from different statutory bodies and port users. In addition, allocation and management of physical resources like berths, anchorage, channels, tugs, warehouses, storage space, human resources, etc. are also to be considered. Therefore, management of a port involves efficient deployment and utilization of all resources, backed-up by timely and accurate information, which can be successfully achieved only by efficient deployment of state-of-the-art Information Technology.

7.3.3 In view of innovations in Information and Communication Technology, the maritime industry is undergoing rapid technological changes. High degree of automation in operations is aimed at the ports world over to meet the increase in demand of efficiency of port operations. Hence, application of Information Technology is one of the key issues in the modernization of Ports.

7.4 **Major Business Processes in Ports:**

7.4.1 Enterprise Management: It covers (i) Human resources; (ii) Finance; (iii) Accounts; (iv) Estates; (v) Legal and (v) IT

7.4.2 **Operations**: (i) Capacity & Demand Planning; (ii) Shipment Booking & Routing; (iii) Gate Management; (iv) Yard Management; (v) Berth Management; (vi) Vessel Management; (vii) Service center operation; (viii) Customs, Health inspection & Immigration; (ix) Warehousing Operation and (x) Equipment Management and Maintenance

7.5 Computerization at Indian Ports

7.5.1 Computerization at Indian Port sector began in 1970s but it was limited to processing statistical information, preparation of wage bills, etc. It was in mid 1980s, when some ports initiated action towards computerization of their activities. However, Indian Ports are now rapidly moving towards application of state-of-art technology and internet technology to implement integrated Port Operation System and to move towards paperless regime so as to reduce dwell time and as also cost to users. The major areas includes, where such automation is aimed at by use of IT: (i) Vessel Traffic Management System (VTMS); (ii)Information Technology in Scientific Application, the Cargo/Container handling operations, the non-operation areas; (iii) Surveillance System and Safety & Security System;(iv) Electronic Commerce (EC)/Electronic Data Interchange (EDI) .

7.5.2 **VTMS** regulates the arrival and departure of vessels in the Port channel. VTMS has already been installed at Mumbai, Jawaharlal Nehru, Kolkata, Cochin, New Mangalore and Mormugao Ports. The status of installation of VTMS at other Ports is as follows:

Kandla : VTMS is installed for the Katchch region.

Chennai : Installation is in progress (Civil work is going on)

Visakhapatnam : Presently Traffic is being managed by GPS Radar & AIS

Tuticorin : It will be procured shortly.

Paradip : Presently Traffic is being managed by GPS Radar & AIS. Tenders are being issued.

Ennore : Presently Traffic is being managed by GPS Radar & AIS. It will be procured shortly.

7.5.3 Information Technology: It has scientific, operational and non operational applications. Scientific applications carried out at major ports in India cover hydraulic studies of the river regime at Kolkata and hydrographic surveys at the ports of Visakhapatnam, Mumbai and Kandla. Survey crafts are now equipped with integrated Computer-GPS system for survey and preparation of Bathymetry Charts.

7.5.4 Operational Application: Major Ports in India have been implementing/implemented heterogeneous system using the latest technology covering the following modules/applications for efficient functioning of ports: (i) Integrated Vessel Services and Control Management; (ii) Integrated Cargo Management and Accounting System for all types of cargo (which includes import & export module, Rail/CONCOR Operation and billing); (iii) Integrated Container handling and Tracking system; (iv) Resource Planning (Including Equipment, Labor etc). Most of the Private Container Terminal Operators in Major Ports have also implemented Terminal Operation Systems like NAVIS, CATOS, etc.

7.5.5 Non-Operational Application: Areas under this category which have been computerized by the Ports, are Pay Roll preparation and related accounting functions such as P.F. Accounts, Loan Accounts, Income Tax, Financial Accounting, Stores Inventory, Personnel Management, Estate Management, Hospital Management, Materials Management System, etc. All ports have carried out Comprehensive Computerization including Port Operation System. However, Ports like Cochin, New Mangalore and Mormugao have implemented Enterprise Resource Planning (ERP) Solution along with Port Operation System and other modules that are not part of ERP Solution. Jawaharlal Nehru Port is attempting to implement few modules of ERP Solution. Other Ports are also attempting to implement ERP solution along with Ports Operation System.

7.5.6 Surveillance System and Safety & Security System:

7.5.6.1 As a result of terrorist attacks/threat, a number of new technologies have been introduced to help the implementation of International Ship & Port Security Code (ISPS) code in various countries including India. All the Major Ports are ISPS compliant. In process of implementing ISPS, the need for bio-metric based access management was felt and many ports are in the process of implementations. Besides, the requirement of CCTV based control system has also been felt and some ports are also reaping the benefits of the same.

7.5.6.2 Now, all crafts tend to have GPS system, which install a satellite station on a ship. Similarly the use of radio frequency identification (RFID) is gaining ground in logistics and transport planning and optical character recognition (OCR) is being used in terminals to speed up the processing of containers in and out. It is also proposed to introduce container scanning system in a phased manner, in addition to the introduction of automatic surveillance system like CCTVs.

7.5.6.3 The recent 11/26 attacks on Mumbai, the surveillance and security has become top most priority in Ports. Therefore, the need of very stringent and secured smart card and biometric verification at access points within ports/terminals for the seaport personnel, vehicles and container truck traffic management has arisen. Ports are geared to take up this challenge. The need of electric fencing with breach alarm is also felt.

7.5.7 Electronic Commerce (EC)/Electronic Data Interchange (EDI): EDI has become an essential element for maintaining the efficient operation not only of ports but also for the complete trade and transportation cycle.

7.5.8 Towards Integration- Port Community System: EDI implementation at Ports was in a piecemeal fashion and hence the real benefits have not realized so far. Therefore, steps have already been initiated to implement Centralized Web based - Port Community System (PCS) at all Major Ports to reap the maximum benefits of EC/EDI and move towards a paperless regime.

7.5.9 Port Community System (PCS)

7.5.9.1 It is intended to integrate the electronic flow of information and function as the centralized hub for Indian Ports and other stakeholders like Shipping Lines/Agents, Surveyors, Stevedores, Banks, Container Freight Stations, Government regulatory agencies, Customs House agents, Importers, Exporters, CONCOR/Railways, etc. through common interface in secure manner using the latest technologies. It will be accessible through a secure and personalized web browser. This central and common facility will definitely save time and money and improve the speed of the services.

7.5.9.2 **Main Objectives of PCS are:** (a) Develop a centralized web-based application, to act as a SINGLE WINDOW, for the community members/stakeholders to exchange messages electronically in secure way and; (b) DATA REPOSITORY for research qand analysis. **Already Vessel, Cargo, Container, Transport finance related messages and e-payment module with 12 Banks have been made ONLINE**. Non-Major Ports namely, Pipavav, Mundra, Dahej have migrated to PCS. Efforts are being done to migrate other non-Ports to PCS.

7.5.9.3 **Benefits of PCS:** (a) User will be able to file documents for any port from anywhere in India; (b) Convenience 24x7 submission; (c) User will be able to monitor and track the activities through the web; (d)Provides both web forms as well as message (XML, UN/EDIFACT, TXT format) exchange options; (e) Standardization of Information exchanged; (f) Provides gateways for payment, SMS, E-mail, etc. centrally; (g) Timely Alert during exceptions on e-mail, SMS, etc; (h) Minimize hardware, software procurement and maintenance cost by avoiding duplication of resources at each Port Community; (i) Better security, redundancy and providing for Disaster recovery; (j) Building of a repository of information for endless query options and a variety of needs including statistics and research; (k) Over a period of time when the repository of information gets built up the past data can be quite valuable.

7.5.9.4 The ultimate aim is to seamlessly integrate all members of the port community and also to provide and electronic platform to act as a single window to exchange messages. This is definitely a **positive step towards improving Communication & Productivity and reduction in transaction cost at Indian Major Ports.**

7.5.10 All the above measures will transform the Indian Ports into a truly top-notch world-class technology driven ports. When India is becoming third

largest economy in the world, ports also need to be geared to catch up with the requirement of world trade and contribute to the economy for which the ports should be equipped with the State-of-Art Technology.

7.5.11 Information Systems at Shipping – a model

7.5.11.1 SET-IT is a major project initiative taken by The Shipping Corporation of India to have enterprise wide transformation using Information Technology. The Scope of the project includes automation of the following business areas.

(i) Liner Shipping business, Bulk Carrier and Tanker Business, Fleet Management and Technical Services, Procurement of Material and Services, Human Resources (Shore and Fleet Personal), Financial, Cost and Management Accounting;

(ii) Business Process Integration through PI, MIS/ Business Warehousing & Business Intelligence, Master Data Management, Employee Self Services / Managerial services through Portal, Document Management System;

(iii) Interface to EDI Systems.

(iv) Construction of state of the art Data Centre and IT Infrastructure upgrade.

7.5.11.2 Business Benefits include: **Customer Support –** 24X7 Customer service and support is possible using technology; **Web Access -** Single log on through internet for the Agents. Cargo Container Tracking through internet for customers; **Chartering –** Automation of Voyage and Time chartering and its related activities; **Ship Management –** Improved process of PMS, Repairs Maintenance, Dry docking, spares, stores supply, bunker supply and crew management**;**

7.5.11.3 **Work Efficiency** - Implementing ERP and COTS will make an employee work efficiently. Less time spent on reconciliations and more time on quality work; **Single Transaction Entry** - Levels of data aggregation and iteration is eliminated by the single entry of transactions into the ERP-COTS system; **Real-time Integration** - On-line, real-time, integrated data from COTS into ERP as well as within each module of ERP reduces service time, reconciliations and enables data traceability; **Process Oriented** – The company becomes process driven. Efficiency in end-to- end processes leads to GROWTH for the company; **Access to Integrated Data** – The details required can be accessed from any location resulting in speed, accuracy and transparency of information; **MIS** – Very efficient tools for Management Information and Decision support'; **ESS –** Employee Self

Service through portal.

7.5.11.4 **Director General Shipping (DGS):**The IT mission of DGS is to be an effective and efficient regulator for delivering quality services and achieving effective enforcement of laws Its priority to provide mandated services which may be enhanced and supplemented by application of Information Technology by providing additional services to individuals / Industry. DGS envisages a future plan of providing all the services on Line by making our website fully interactive and integrating it with all the MMDs. Further it would be DGS endavour to integrate all the stakeholders on one portal.

7.5.11.5 ***eSamudra*** **Project:** This project is one of the vital e-governance initiatives implemented in the directorate and its allied offices, across the country. The scope of project includes computerization of various business functions of DGS by developing different e-Modules resulting in process automation and creation of huge database containing vital information about various business entities such as ships, licenses, examination, CDC, INDOS etc. Phase-I of the project is already on the verge of completion and the directorate would be freezing on activities to be considered in phase-II of the project. Following e-Modules have been developed and deployed at all concerned allied office of DG Shipping: (i)Coastal Shipping; (ii) Examination System (completed in part);(iii)Ship Licensing & Chartering (iv)PRISM – CDC;(v)SMO –other activities;(vi)Meetings & Resolutions; (vii)Inward/Outward(viii)File Tracking & Documentation;(ix) Manning Agency (RPA);(x)MTO System;(xi)Ship Registration and;(xii) INDOS Online

7.6 Existing Status of IT Implementation in India's Maritime Sector

7.6.1 Existing Status at Ports: The type of infrastructure provided at the port largely depends on type of cargo handled such as ***General cargo (Break-Bulk / Container), Dry-Bulk (Ore, Fertilizers, Coal, Food Grains, etc.), Liquid-Bulk (Chemicals and POL, etc.)***. Accordingly, Information System/Application System will vary with the nature of cargo. Major applications, which are required to be implemented for efficient functioning of the ports, are: (i) Vessel Information and Control System; (ii) Cargo Information and Control System; (iii) Container Tracking and Control System; (iv) Financial Management System; (v) Payroll and Personnel Information System; (vi). Inventory Management System; (vii) Materials Management System; (viii) Estate Management System and; (ix) Port Management Information System

7.6.2 Implementation of Information System at Ports could be either implementation of Comprehensive Computerization or implementation of Enterprise Resource Planning (ERP) Solution with Port Operation System (POS)/Cargo Operation System on the top of it. The details of which is as follows: Three Ports as given below have implemented Enterprise Resource Planning (ERP) Solution along with Port Operation System (POS) and other module that are not part of ERP Solution are: Cochin, New Manglore and Mormugao. Following Ports have carried out Comprehensive Computerization: (1)Kolkata (Including HDC); (2)Paradip (Tendering stage for ERP solution); (3) Visakhapatnam (implementing ERP solution); (4)Chennai; (5) Tuticorin; (6) Mumbai; (7) Jawaharlal Nehru (also attempting to implement few module of ERP solution) and; (8)Kandla

7.6.3 Existing Status at Shipping Sector: The Shipping Corporation of India has taken a major IT initiative to standardize and automate the business processes using the state of the art IT infrastructure. The ERP implementation project has gone live with majority of the modules along with the end-to-end integrated processes. Some more modules such as E- Tendering etc are being implemented as Phase II. Also steps are being taken to setup a disaster recovery site (DR) to handle any eventuality.

7.6.4 Existing Status of National AIS Network (NAIS): The Directorate General of Lighthouses and Lightships (DGLL) is setting up of a National AIS Network 74 shore stations on existing lighthouses along our coast and in our island territories will be established. The NAIS Network would permit tracking of all AIS-equipped vessels transiting close to our coast.

7.6.5 Existing Status of Coastal Surveillance Network (CSN): To monitor the traffic along the entire coast of India, a network of shore radar stations and electro-optic surveillance systems at 46 locations along the coast and in the Lakshadweep and Andaman & Nicobar Islands, is being set up by the Indian Coast Guard. The radars and electro-optic sensors will be installed on select lighthouses of the Directorate General of Lighthouses and Lightships (DGLL) at 38 location on mainland/Lakshadweep Island and eight lighthouses/convenient structures in the A & N Islands.The NAIS network and the CSN would together provide real time situational awareness off the Indian coastline and island territories.

7.7 Existing status of e-Governance in the Directorate General of Shipping and its allied offices: Various activities to be carried out towards efficient implementation of e-Governance through ***E*-Governance projects are as follows:**

7.7.1 *eSamudra* Project This project is one of the vital e-governance initiatives implemented in the directorate & its allied offices, across the country. The scope of project includes computerization of various business functions (functions of various branches of DG) of DG Shipping by developing different e- Modules resulting in process automation and creation of huge database containing vital information about various business entities such as ships, licenses, examination, CDC, INDOS etc.

7.7.2 *ePariksha* Project: This project aims at conducting Online Examination for nautical and engineering wings' competitive exams. This project would be executed across all the exam centers all over the country.

7.7.3 Implementation of *e-Payment Gateway:* The Directorate General of Shipping (DGS) plans to implement e-Payment gateway for all its financial transactions. It would undoubtedly facilitate DGS to control and monitor the fiscal transactions.

7.7.4 Information Exchange between DGS and its allied offices: The information exchange between DGS and its allied offices would be made possible by migrating/integrating different databases existing in allied offices of DGS. Channeling and centralizing of shipping/maritime data would enable DGS to generate/compile MIS in analysis & policy decisions.

7.8 Existing status at Inland Waterways Authority of India (IWAI): IWAI has been working on Design & Development of Web based Portal for IWAI activities through NICSI. In this particular project some development had already been carried out. This portal will cover data/information related to Project Management, Vessel management, Terminal Management, Cargo, Hydrographic, Survey, Establishment, Administration and Finance. The portal is being designed for online processing of proposal as well as monitoring of activities/projects

7.9 Existing Status at Ports under Gujarat Maritime Board (GMB): GMB has already implemented online TATAEX software modules for Port dues payment, Payroll, asset management; online budget preparation using CITRIX server. GMB has initiated implementation of Integrated Port Management System (IPMS) which will cover: (a) GIS based lands & assets management system (particularly for Alang); (b) A low cost communication platform; (c) A fully integrated biometric based access control & T&A system; (d) Web portal management system; (e) Document management system; (f) Store/inventory management system; (g) Customer grievance management system; (h) Integrated Security Management System; (i)Pension Management System; (j) Traffic Management Module; (k) Control Room and Audio Video Surveillance; (l) Electronic Data Interchange and; (m) Environmental statutory clearances management system for Alang. Besides, GMB's IPMS project will also include ship's identity, digital fencing (virtual fencing), security & surveillance equipments, and latest equipments for container scrutiny by putting latest technology in container handling cranes. GMB is already having VTMS services operational in Gulf of Khambat for monitoring the traffic routes of the vessels which will be integrated with IPMS.

7.10 Implementation of EDI/PCS in the Non-Major Ports:

7.10.1 In the Maritime State Development Council (MSDC) meeting held in August 2010 at Chennai, it was resolved that '**For facilitating paperless transaction to enhance port operations, all non-major ports would ensure their integration with the Port Community System (PCS) for which workshops would be organized by the Indian Ports Association in the Maritime State**"

7.10.2 Migration of Non Major Port to Production Server: The Ports like Mundra, Dahej, Pipavav and Gangavaram, which contribute a big share in terms of traffic of non-major portswere to be completely brought at production server by July 2011. However, Mundra, Dahej & Pipavav Ports have been migrated under the ambit of PCS for LIVE exchange. Efforts are being done to migrate Gangavaram also under the ambit of PCS. Efforts are also being made to bring six Non Major Ports namely Kakinada, Nagapattinam, Magdala, Jamnagar, Sikka, Bedi **(as per Custom Roll -Out List**) under the ambit of PCS. The pre-requisite to integrate with PCS & ICEGate is internal automation at non-major ports only.

7.11 International Practices

7.11.1 A close look at maritime and port sector globally would reveal that the countries that are successful in attracting higher volumes of sea borne traffic and trade, have invested quite substantially on technology and deployed advanced IT systems to improve the efficiency of the port operations. In an attempt to analyze the successful international ports, Working Group studied IT applications and investments in IT systems in detail of Ports of Singapore and Amsterdam Following are the major IT infrastructure investments/deployments initiated by these ports/countries.

7.11.2 Integrated Terminal Operations Systems: Integrated Terminal Operations System is an Enterprise Resource Planning system for Ports/Terminals. It is a powerful tool that allows the port to manage its equipment and people seamlessly, flexibly and in real-time and integrates every asset from prime movers, yard cranes and quay cranes to containers and drivers. It integrates planning room PCs, PCs on-board cranes and various database and servers via a real-time fibre optic communication network and wireless data transmitters. All components work together to cater for every aspect of the terminal's operations. Terminal Operations Systems include the following applications: (a) Berthing of the vessels; (b) Ship and Yard Planning and (c) Resource Allocation.

7.11.3 Port Community Systems (PCS): It provides a single window to securely exchange the documents and information electronically between Ports and other stakeholders involved in the maritime transport and logistics chain including the trading partners and government agencies. It also provides global visibility and access to the central database to all its stakeholders through internet based interfaces. The web based PCS, connects Ports to shipping lines, freight forwarders, shipping agents, transporters, banks and other government agencies, helping them to synchronize their complex operational processes enabling Electronic Data Interchange (EDI). PCS are integrated with IT systems used by shipping lines and shippers to slot exchange, manage transshipment process and monitoring the performance.

7.11.4 Optical Character Recognition (OCR) System at Gates: OCR systems are fully automated gate-in and gate-out system at terminals that identifies containers as well as trucks passing through the gates. It would capture, recognize and record the container and the truck numbers. The system typically comprises of an image capturing system, Character/image Recognition software and database for storage of images and the data. This system is integrated to the Terminal Operation systems for verification and update of container number coming into and out of the port/terminal. This system would increase the efficiency and throughput at the terminal gates and reduce the waiting time at the gates for trucks. At PSA, its 'Flow Through Gate' handles an average traffic flow of 700 trucks per peak hour.

7.11.5 Vessel Traffic Management Systems (VTMS): It is a real time system that allows full sharing of information about arrivals, departures and transits among all the maritime parties, is used by port and harbor authorities to manage the vessels traffics in port waters and monitor the waterways. The VTMS ensures safe navigational services to vessels at the port and acts as a Command Centre for Crisis Management Operations such as SAR, oil spill detection and anti- terrorist activities. In addition to monitoring the shipping lanes to enforce compliance of safe navigation regulations and providing protection of vessels carrying hazardous cargoes, VTMS systems assist Coast Guard and other Authorities to ensure the security in the port waters. VTMS includes special sensors and systems for oil and gas ports increase the safety of vessel transit and berthing.

7.11.6 Harbor Craft Transponder System: Maritime authorities of many countries in collaboration with Coast Guards and Navy have been implementing harbor craft transponder system systems to automatically track and monitor small powered harbor and pleasure craft in their port waters. All harbor crafts need to carry a transponder on them and this system allows real time data from the transponder such as vessel identity, position, speed, course and other information are transmitted to a main system in the shore through wireless network. The crafts can also alert the control centre if there is a security threat or emergency.

7.11.7 Radio Frequency Identification (RFID) and Container Tracking System: Port of Singapore (PSA) has deployed of RFID transponders into its container yard to create a multi-dimensional tracking grid in 1993. The PSA tracks many thousands of multi-ton cargo containers daily, and also manages arrivals and departures of up to 50 ships. A centralized system manages the placement and location of containers. The Port of Rotterdam is one of the largest operators of container handling systems. RFID transponders guide automated guided vehicles (AGVs). Deployment of this system began in 1990. The RFID automated terminals achieve a much higher efficiency than its manned counterparts. All container transfers are controlled by automated guided vehicles, and unmanned bridge cranes carry out stacking operations – all without human intervention. The implementation of the RFID would eventually:

a) Facilitate the flow of accurate and timely information across supply chain partners and Government agencies;
b) Optimise container logistics processes;
c) Improve supply chain efficiency and reduce costs;
d) Achieve more efficient and individual container traceability;
e) Deter theft, diversion and counterfeiting;
f) Integrate RFID technology into existing business practices;
g) Reduce face to face intervention and thereby reduce scope for corruption/discretion

7.11.8 Maritime Security and Surveillance Systems: Maritime Surveillance System are used globally to detect, classify and track threats and disseminate information to the proper response personnel and monitor and control entry to ports and inland waterways. Integration of this system with Automatic Identification System (AIS) technology provides situational awareness with identification of approaching vessels. The software analyzes the data and identifies situations that are out of the norm and sends alerts to respective authorities. When an unidentified vessel approaches inland waters, operators are alerted with warnings. The system also provides support to search and rescue and emergency response teams in case of emergency.Maritime Surveillance System includes wireless Surveillance, remote monitoring, night vision systems and video analysis. It compiles data from a variety of sensors and other sources and processes the data to provide critical decision-making support to coastal, port and waterway authorities.

7.12 Emerging Trends in IT Applications in Global Airtime Transport

7.12.1 Vessel management in Ports will become fairly uniform across the world and ICT will have a greater role to play due to security concerns. **Real time flow of information about ships** in transit will become a reality through regional joint initiatives and Ports will have accurate and frequent ETA declarations. Berth planning and ship scheduling will become far more reliable.

7.12.2 **Information flow across the entire logistics chain** (Community based systems) will be shared across all the stakeholders resulting in better planning and mobilization of resources. In land transportation (truck and rail) will be more amenable to planning and scheduling resulting in better evacuation of cargo from the ports. The service time inside the Port will become much shorter due to the availability of the right documents and compliance achieved through communications from the Regulatory agencies like customs.

7.12.3 In the future, usage of **ICT, particularly the mobile technology** will be very high. People and processes will be oriented towards mobile technology to speed up the information and cargo flow. RFID combined with global positioning systems (GPS) on all the equipment including ships, land transport vehicles, gantry cranes to facilitate tracking and documenting movement and storage of cargo/ container. Mobile, noninvasive inspection systems allow for inspection/ screening with minimum effect on the flow of commerce. The hitherto grey areas for shipment tracking and tracing while in port or in transit at sea will diminish. Irrespective of where the cargo is i.e. in truck or warehouse or container, ICD, Port, ship etc. the consignee and the consignor will be able to keep track of its movements. Use of a wireless LAN (WLAN) for data transmission throughout the seaport and use of wireless handheld computers for dock workers will become increasingly common. New technologies for gate control, perimeter security and surveillance such as multiple types of access control devices with biometric controls intelligent fence systems, chemical and biological detectors, underwater cameras, and infrared perimeter motion detectors will be used.

7.12.4 For water, traffic, and navigation managers, Geographic Information System (GIS) combined with Global Positioning System (GPS) technology offers a superior solution for tracking vessels and managing traffic in crowded waterways. Database-driven nautical charting solutions make it easier for maritime administrations worldwide to efficiently manage chart products and generate high-quality navigational products. Therefore, the implementation of GIS will increase.

7.12.5 The number of manual interventions along the process flow will be drastically reduced resulting in very **quick decisions driven by the system** – starting from quotes from the shipping lines for booking till the delivery of the cargo. This is possible only if documentation flow will be 100% digitalized. In this connection, Digital signature should be approved and introduced as soon as possible so that a complete paperless handling of documentation and payment flow is made possible. End result would be **One Stop Shop** (single window) concept and inter-modal transport linking strategically between ocean, railway, road and inland waterway.

7.12.6 In near future, Indian shipping industry will be having **Integrated Logistics**

Management System linking all entities, which is lacking presently. This system will be integrated with road transport, FOIS of Railways, container operator system including CONCOR, Port Community System (PCS) and Shipping System to drive maximum benefits to entire industry. The entire transaction from the booking by the shipper to the payment of insurance to the final delivery of goods damage-free, full in quantity can ultimately be tracked and carried out online. This will lead to standardization of all commercial documents used in domestic trade and inter-state movement and EXIM trade. This would also require a comprehensive solution of GPS based vehicle tracking/communication equipment, up-to-date GIS maps, call centers, portals, and service providers.

7.12.7 The efficiency of the ports will be based on the infrastructure and the operating system to drive the planning, operations, control and review. **Port/ Terminal Operations System will be one of the key differentiating factors among competing ports.**

7.13 Current gaps in the Indian Port/ Shipping/ Logistics industry vis a-vis international standards

7.13.1 Port Operations systems implemented in many Indian ports cover only the **billing process** – capture of the billable activities through on line or batch mode, applying the tariff and settlement of bills. **No element of operational planning, deployment, scheduling or execution are covered** through the Port Operations software because:

a) The software solutions are built around the existing manual processes and practices (except for some container terminal operations);

b) The domain inputs come from the operations personnel of the port who are hard pressed for time cannot ;

c) The features in the systems developed are limited to what is required as per the existing manual operations.

As a result, most of the processes in the operational chain which do not have a link to the billing process are left out of the computerization process. Since the Port Operations are not dependent on or driven by the software, it is not used optimally. In most ports, the integration of different modules of the Port Operations software solutions with the back office functions are not yet available. These modules function in isolation.

7.13.2 Operation of the system is not critical to Port Operations (except in the case of container terminals) since planning and scheduling are not present. Monitoring the operations through alerts and introducing course corrections are not system driven. The usage of system is focused more towards recording various activities for generating invoices or statistical information. **This is the major gap.** There is a pressing need to provide realistic simulation models to facilitate optimum utilization of available port resources and better information management to improve customer serviceability (as a service differentiator). Therefore, GIS solution for following need to be implemented:

7.13.2.1 Port Operations: (i) Real Time Vehicle & Asset Location;(ii) Vessel Routing & Tracking;(iii) Berth Occupancy & Assignment;(iv) Cargo & Berth Time Calculation; (v) Dangerous Cargo Display.

7.13.2.2 Public Information: (a) Shipping Channels Location and;(b) Restricted Area Awareness

7.13.2.3 Data capture is done manually as against automatically in ports of the developed countries. Data capture is automated with the equipment and devices. E.g. Gate movement of vehicles, containers, vessel movements, truck movements, rail movements etc. This result in delays is error prone and does not validate the data thus captured. Real-time & accurate information for stakeholders is often not available. Therefore, the need is to implementation of following:

i) Automate Gate for secure and free flow traffic movement : The Process for automatic Gate shall be as follows: After a manifest is submitted, the fully automated and paperless process at the gate clears trucks entering the port may use the following steps:

a) The truck arrives at the in-gate. The driver taps his port pass on the Self Service Terminal (SST) and verifies his identity through a fingerprint biometric reader or keys in his Personal Identification Number (PIN).

b) The truck is weighed at the weighbridge.

c) The gate picks up the truck's identity from the In-vehicle Unit (IU) at the dashboard.

d) The gate's Container Number Recognition System (CNRS) captures the container number via Closed-Circuit Television (CCTV) cameras

e) The system checks the driver's identity, truck's identity, weight and the container number against the manifest and clears the truck for entry.

f) The system sends a message to the driver's mobile phone or Mobile Data Terminal (MDT) on the exact position in the yard where the container will be stacked.

ii) Automation of Trucker movement around Ports : To avoid congestion of trucks around ports, the movement of trucks shall be automated. And trucks shall come around the ports during the prescribed time limit in the computerized pass.

7.13.3 Sharing of information among the various stakeholders of the Maritime community is not fully enabled in a structured way. Integration of the various applications within each entity and then exchange of key information with the other players in the logistics chain needs to be focused. Currently not able to service the diverse information management needs of various logistics supply chain stakeholders. Need to further facilitate paperless trade to reduce transportation costs and speed of information processing. India has low IT penetration as compared to Japan, Singapore, Australia and South Korea.

7.14 Recommendations

7.14.1 Despite the huge size of the country, the import and export flows are still modest, when compared with other countries in East Asia. This is reflected especially in India's container throughput, where volumes are only a fraction of the Chinese container exports and imports. Also port development is much smaller and where Chinese ports are now the worlds leading ports (with the majority of the largest container ports being Chinese), the Indian ports are still relatively small ports.

7.14.2 Logistics costs as a percentage of Gross Domestic Product (GDP) range from around 9 per cent in the United States of America (USA) to 11–12 per cent in France and the United Kingdom and 10–15 per cent in China, India, Japan, and Singapore. The logistics sector in India is very fragmented. Only in some sectors, e.g. in the automotive industry, the concept of outsourcing and chain control is fully

7.14.3 Many Companies/Organization in logistics industry have significantly changed the way they do business by implementing ERP models, Port Community System (PCS). However parts of the transaction in the Maritime Community are still paper based. Therefore, digitalization process, which normally should lead to benefits for the users in terms of the time and cost advantages, has not been completed in logistics industry in India

7.14.4 It is also noted that only few Non-major ports have shown interest in the implementation of Port Community System (PCS). It is also observed that most of the small users does not have internal computer application therefore, they are using user interface of PCS and doing data entering for submission of document instead of uploading messages from internal application system. Therefore, it is felt that Government of India shall take initiative to develop such module and provide to the users at nominal cost. There is urgent need for implementation of suitable IT solution for Management of intermodal cargo transfer to avoid cargo traffic bottlenecks, increased waiting time and lost efficiency; Management of Multimodal transit network of Ports which may include cargo, trucks, Trains and coastal ships; Automation of trucker movement around Ports with the help of GPS/GIS and RFID tag technology; Automation of Port Gate for free flow traffic; Exchange of Position of Ship in sea as provided by LRIT shall be implemented for all the Port and Shipping fraternity; Digital signature should be approved and introduced as soon as possible so that a complete paperless handling of documentation and payment flow is possible. Only by doing so, the so needed improvements in lead time and logistics cost advantages can be realized; National Payment Gateway including all banks so that users can make ONLINE payment from any banks and branch

7.14.5 Need for a **single window electronic platform** for maritime stakeholders to have a common interface. Therefore, it is felt that keeping Port Community System (PCS) as a base, other components can be integrated using Service Oriented Architecture (SOA).

7.15 Other Recommendations – Sector Wise

7.15.1 Ports Sector

7.15.1.1 Each port should undertake Enterprise Resource Planning (ERP) solutions which would cover all functional areas including port operation. The functional areas where ERP solutions are not available off the shelf, the solutions should be developed and integrated with ERP solutions. Ports like Cochin and Mormugao have already implemented ERP Solution along with Port Operation System and other modules that are not part of ERP Solution. New Mangalore is in the process of implementation similar ERP Solution followed by all the other Ports.

7.15.1.2 Non ERP solution like GIS linking with the Land/Estate Policy, Hospital Management, Bespoke System like Vigilance, Legal, File Tracking, Employee welfare etc.

7.15.1.3 Ports shall implement Land/Estate Management solution which is completely scalable for implementation of other Business Process like Financial and Management Accounting, etc.

7.15.1.4 The provision for Self Service Scheme available in the system would be introduced as an employee welfare measure.

7.15.1.5 Automated equipment (Cargo/Container handling, Weight Bridges) shall also be integrated with the centralized system to avoid manual intervention.

7.15.1.6 Campus cabled LAN Network system shall be undertaken covering all the automation system and as a redundancy wireless LAN network shall also be considered.

7.15.1.7 GIS technology shall be implemented in Port Operation, Security, Intermodal management, Property and lease Management, Emergency Response & Management, Environment Management.

7.15.1.8 The IT Policy of the port should be such a way as to integrate all sophisticated systems in the port in a comprehensive manner such as VTMS, AIS, RFID, CCTV, Surveillance System and other security systems.

7.15.1.9. A comprehensive data base needs to be developed by the ports themselves which will lead decision making and provide artificial intelligence and Dash Board.

7.15.1.10 For the paperless scenario, readymade software toll such as Universal Content Manager shall be implemented for document exchange with approval process by defining roles and responsibilities among inter ports and regulatory bodies..

7.15.1.11 Sufficient and suitable manpower shall be placed in each port for managing IT systems and these personnel shall be trained periodically to update their knowledge & know-how.

7.15..1.12 Each Port shall aim toward the goal to secure the ISO 27001 certification.

7.15.2 Shipping Sector

7.15.2.1 ERP Implementation: Integrated ERP implementation is imperative to the shipping companies to automate and standardize their business processes. To provide a best logistical solution and requisite information about cargo movements to the global customers and to get a competitive advantage, the companies needs to constantly upgrade their IT solutions.

7.15.2.2 On board Systems: Fleet Management, safety on board the vessel for the seafarers and cargo along with the international standards are the essential aspects of shipping lines. Hence to achieve this an effective Fleet Management system having an implementation on board the vessel to record all the events and requirements and getting it integrated with the shore based ERP system will ensure the above requirements. Also having the navigational software with the tools to compute the optimum distance with all the weather conditions would effectively determine the route to be followed in the case of bulk cargo movements.

7.15.2.3 MIS / Decision Support System: As shipping is a capital intensive business, proper decision making towards investments and an effective cost control is very important. A very effective Data warehousing and Business intelligence tools needs to be implemented to generate Management Information and decision support reports. Now, even the dash boards are being implemented to control the business online.

7.15.2.4 EDI : Even though the ERP implementations cater to the major requirements of internal processes of a shipping line or a shipping agent there are many external stakeholders such as ports, customs, ICDs, Depots, warehouses, shippers, consignees, Charterers, CHAs, banks, container leasing companies, surveyors etc. who are playing a very vital role in the complete chain of logistical solution. Currently, we have standard Interfaces defined by certain international organisations for the shipping trade related Electronic Data Interchange. Certain countries have extended further and created a E-Commerce platform for the shippers, consignees, shipping lines, shipping agents to handle their data through a central repository to avoid duplication work by various agencies.

7.15.2.5 Integrated E-Commerce framework – Ultimate Objective: A similar framework with more extensions can be initiated in the Indian shipping sector to have a common platform to benefit all the entities belonging. As the technology is fully matured to achieve this objective all concerned need to come together to make this happen. Even a legal framework can be thought of to enforce this technology initiative which would reap the maximum benefit in terms of commercial and on quality of service.Some of the foreign shipping lines are bringing the BPO services to India. This gives us an opportunity to have standard business processes and international best practices to get adopted.

Chapter 8: PPP Framework & Bench Marking

8.1 Major Challenges facing India's Port Sector

8.1.1 The capacity constraints at India's ports will only increase in the future. Maritime Port usage was at an average of 87 per cent for both major and non major ports with major and minor ports clocking 85 % and 91 % capacity utilisation respectively even during the global recessionary year 2010–11.

8.1.2 Constrained by capacity, the country's ports face two challenges over the next 3 years:

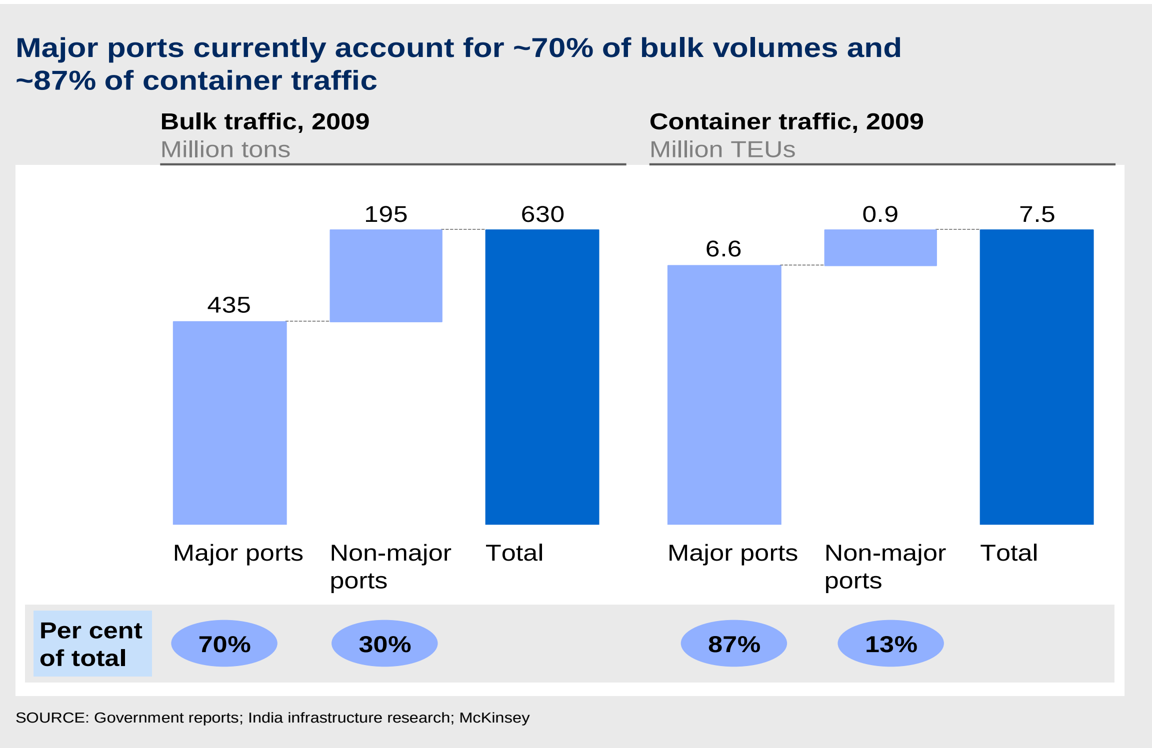
A. Effectively using PPP to add new port capacity The conceptualisation, take-off and execution of these PPP projects, however, are far behind the planned timelines.

B. Efficiently using existing port capacity: Indian ports lag behind international benchmarks of port efficiency which offers tremendous scope for further improvement.

8.2. The central government can help the ports to overcome these challenges

8.2.1 The central government, through its control over 13 major ports, controls 70 per cent of India's bulk traffic and 87 per cent of its container traffic (Exhibit 1). It can therefore play a critical role in helping India overcome the challenges to increasing port capacity.

EXHIBIT 1



Capacity addition and utilisation are two key challenges in preparing India's ports for growing freight traffic.

8.3. Speeding up PPP Projects to add Capacity

8.3.1 India's first public private partnership (PPP) port project dates back to 1997. Today 35 PPP projects are operational across major Indian ports, with the maximum (five each) in operation at Vishakhapatnam and Kandla (Exhibit 2).

EXHIBIT 2

PPP projects at major ports in India since 1997

Name of port	Number of projects	Nature of PPP projects
Kolkata	3	Construction, operation, management and operation of Berth No. 4A at Haldia Cock Complex, Kolkata Port Trust
		Allotment of Berth no. 12 through private sector participation
		Supply, operation and maintenance of different cargo handling equipment at Berth no. 2 & 8
Paradip	3	Development of Deep Draft Iron Ore berth on BOT basis
		Development of deep draft coal berth on BOT basis
		Development of multi-purpose berth to handle clean cargo including containers on BOY basis
Vishakhapatnam	5	EQ8 and EQ9
		Container Terminal
		WQ-6
		EQ-10
		GCB
Ennore	4	Development of marine liquid terminal
		Development of non-TNEB coal terminal
		Development of iron ore terminal
		Development of container terminal
Chennai	2	First container terminal
		Second container terminal
Tuticorin	2	Construction of north cargo berth-II for handling thermal coal and industrial coal on DBFOT basis
		Tuticorin container terminal (Berth no. 7)
Cochin	3	Crude handling facility for Kochi Refineries Ltd. (BPCL-KR)
		International Container Transshipment Terminal (ICTT) at Vallarpadam
		LNG regasification terminal at Puthuvypeen
New Mangalore	2	Undertaking pre-feasibility report / DPR
		Development of container terminal at NMP on BOT basis
Mormugao	2	Construction and operation of two multi-purpose bulk cargo berths, 5 A and 6A on BOT basis
		Development of coal handling terminal at Berth no. 7 on DBFOT basis
Mumbai	1	Construction of offshore container berths and development of container terminal on BOT basis in Mumbai Harbour and operation and management of Ballard Pie Station Container Terminal (BPS)
JNPT	3	Construction of two-berth container terminal (NSICT)
		Construction of liquid cargo terminal (BPCL)
		Redevelopment of bulk terminal to container terminal (GTIPL)
Kandla	5	Development of 13th to 16th multipurpose cargo (other than liquid / container) berths at Kandla on BOT basis
		Setting up of barge jetty at Old Kandla on captive use basis
		Creating port-related facilities at OOT, Vadinar for 9 MMTPA oil refinery of M/s Essar Oil Ltd., off Vadinar village
		Development, operation, management and maintenance of Berth No. 11 7 12 as container terminal on BOT basis
		Development, construction and operation of container freight station (CFS) outside the Customs Boundary Area on BOT basis by the licensee
Total	35	

NOTE: Projects described as of January 2011
SOURCE: Indian Ports Association

8.3.2 A majority of these projects involve end-to-end berth or terminal development. A minority involve support activities such as the operation and maintenance of handling equipment. Although PPP ports projects seem to be sustainable in terms of their revenue sharing, bottlenecks at various stages have delayed the conceptualisation, take-off and execution of these projects far beyond planned timelines.

8.3.3 Factors constraining project implementation

8.3.3.1 Problems emerge at each stage while taking up and implementing ports projects in India. All stakeholders lose time and money due to three reasons: pre-tendering delays, sub-optimal interest among developers to take up tenders, and weak implementation of projects..

i. Centralised and slow decision-making delays pre-tendering phase

8.3.3.1.1 There are significant delays in PPPAC regulatory approval, security, environmental clearances required during the pre-tendering phase. This is due to lack of defined timelines for clearance and approval during this phase. In addition, the approvals across various departments and levels happen sequentially rather than in parallel. Delayed approval at one stage can therefore stall the entire process. Hence PPP projects take time to move from conceptualisation to the tendering stage.

ii. Sub-optimal interest among developers to take up new tenders

8.3.3.1.2.1 The developer community has only sub-optimal interest in taking up new tenders for two reasons:

a) Model Concession Agreement (MCA) clauses discourage private investors: Developers find that these contractual terms constrain investors' strategic options. The B.K. Chaturvedi Committee's recommended changes to the MCA can increase risk for developers and lenders, diluting their interest in the project. For example, one of the recommendations proposed excluding the principal falling before the termination date (in a scenario where the contract gets prematurely terminated) from debt due. Similarly, it has been recommended that the lead developer maintain at least a 26 per cent stake at all times. This restricts exit options. Though they are meant in public interest, such recommendations can dissuade potential investors.

b) Tariff policy hampers the financial attractiveness of projects: The Tariff Authority for Major Ports (TAMP) issued a new set of guidelines for PPP projects for major ports in February 2008. These guidelines aim at providing comfort to the investors by announcing the tariff in advance, before they submit their financial bids, thereby reducing regulatory uncertainties. Since a normative approach is adopted to fix tariff, the tariff does not necessarily account for the actual cost of an individual operator. The underlying expectation is that the revenue share to be offered by the bidders will be the leveller between the standards assumed and the actual of an operator.

Nonetheless, the efficacy of the upfront tariff system hinges upon the reasonableness of the norms adopted and reliability of the capital estimates considered. The investors may desire that these issues are addressed and a fool-proof procedure is evolved for implementation.

8.3.3.1.2 .2A major pitfall in fixing tariff upfront is keeping the same tariff base unaltered for the whole concession period of 30 years. Indexation of tariff at (WPI – X) alone may not provide adequate comfort to the investors as it does not capture the additional financial commitments which investors might have to make in view of the environmental, market and technological changes that may take place after commencement of the Concession. Most importantly, the seaward services at major ports are not offered for PPP and the related services and facilities continue to be provided by major port trusts. Tariff fixation in this case follows the tariff guidelines of 2005 which adopted the actual port wise cost plus method. Consequently, cost of inefficiency and redundancy seeps into tariff computation in the name of the actual. Inadequate maritime infrastructure and high marine cost at the ports may adversely affect the business of private terminal operators providing land side services. There is, therefore, an immediate need to review the actual cost plus regime of tariff fixing adopted in these cases. Further, a significant part of the demurrage costs should be borne by ports

iii. Weak implementation creates project delays after uptake

8.3.3.1.3 Even after uptake most projects suffer from time and cost over-runs due to several factors:

a) Low quality design and engineering: Creating a detailed project report (DPR) forms a much smaller percentage of project costs in India compared to global benchmarks. This is because engineering consultants are chosen for a project primarily based on price, with some small weight age for quality. Such consultants might cut corners in their work, leading to inaccurate surveys and low quality DPRs that lack attention to detail. This can often result in surprises during construction and a change in project scope or plans, adding to delays and costs. For example, timely completion of port projects depends on prior knowledge of marine floor conditions. Basing the project plan on inaccurate data can create bottlenecks and cost over-runs during construction.

b) Shortage of skilled manpower: The pool of skilled and semi-skilled manpower (welders, fitters, etc.) has not kept pace with the construction needs of infrastructure. A 2008 survey by the National Sample Survey Organisation reveals that 13 million workers enter the market every year, but only 3 million of those are trained. India's vocational training curriculum is outdated. In effect, 70 to 80 % of the existing work force is untrained which affects the quality of project implementation.

8.3.3.1.4 Absence of specified financial institution, delay in financial closures, involvement of multiple parties and inadequate hinterland connectivity are some of the other reasons behind delay in project execution after uptake

8.3.4 Six initiatives can speed up project implementation

8.3.4.1 Six initiatives have been identified for the government, regulators and nodal agencies to facilitate the implementation of PPP port projects in India. These emerged through discussions with private players, public sector units, and government officials across nodal agencies and regulatory bodies. The effective implementation of PPP port projects can add the much-needed capacity to India's ports. The six actionable recommendations discussed here can resolve the bottlenecks that currently slow down project implementation.

8.3.4.1.1 Establishing a high-power group to monitor and de-bottleneck ports projects

a) Such a group can add transparency and force decisions that enable progress. Its scope should cover a small number of larger projects. The group can be a part of the Committee on Infrastructure, headed by a minister or a secretary. It can bring in other ministries as necessary. The group should:

b) Monitor project portfolio and port trust performance on at least three key metrics: on-time award; actual construction progress against planned milestones; and within-budget completion

c) Consolidate performance data on a quarterly basis and make it publicly available, highlighting areas prone to delays and over-runs

d) Selectively involve providers of large projects to understand bottlenecks and collaborate on `solutions for growing delays and over-runs

e) Escalate inter-ministerial bottlenecks that are impeding important projects (pre- or post-tendering) to relevant authorities, and push for decisions. For instance, the group can selectively convene ministers and bureaucrats from concerned areas, creating an empowered group to expedite the resolution of bottlenecks

8.3.4.1.2 Amending the MCA to balance the risk sharing

8.3.4.1.2.1 The developer community perceives an imbalanced risk-sharing between developers and the government in the ports MCA. The B.K. Chaturvedi Committee has recommended some amendments to the MCA. There is need to revisit the following recommendations with the developer and financier community to constructively amend the MCA for better project uptake:

a) **Project cost should be limited to minimum of approved cost, lenders' cost and actual cost:** Whether and how the nodal agency's definition of cost and its application affect the bidders; whether approved cost has been significantly lower than actual cost; the key sources of deviation; modifications (if any) to the proposed definition of cost and its application

b) **Due debt should exclude the principal that has fallen due before the termination notice:** Whether it increases the project risk for lenders over and above developer's credit risk; whether lenders can factor this risk into pricing; and possible alternative arrangements that address the concerns of all stakeholders

c) **Sponsors to hold at least 51 per cent stake in the special purpose vehicle for two years after commercial operation date (COD); lead member to hold 26 per cent stake in SPV at all times; and each member evaluated for pre-qualification purposes to hold 26 per cent stake for 2 years after COD:** Whether this restricts the lead developer's exit options (do they actually intend to dilute it below 26 per cent?); whether lenders find this clause to their advantage; whether there is a way to retain the lead developer's responsibility for operating the port while de-linking ownership from it

d) **Interest linkage to be changed to 10 year G-Sec from SBI's prime lending rate:** The possible negative consequences of this change

e) **Some other MCA aspects are not referred to in the B.K. Chaturvedi Committee recommendations, but need to be reconsidered** in the light of feedback from developers and financiers. For example, the adequacy of the financial closure window, sufficiency of the "conditions precedent" clause, fairness of basing the terminal payment on book value, enforceability of charge on assets given the immobile nature of assets and the effectiveness of port monopoly norms.

8.3.4.1.3 Modifying the existing economic regulatory framework to achieve uniform regime and use tariff leverage to promote efficiency in operation

There is a need to introduce a uniform economic regulatory framework covering the entire port sector. A two-tier regulatory mechanism, as prevalent in the power sector, may be an ideal choice.

a) The scope of regulation should cover not only tariff setting, as at present, but also setting, monitoring and regulating service levels and performance standards. The regulators may also be entrusted with the responsibility of dispute resolution, as appropriate.

b) A detailed study should be commissioned to assess the extent of competition prevailing in the market for provision of port services in different regions for different types of commodities. If such a study reveals the existence of a perfect market condition, tariff fixation may be left to market forces with the regulatory intervention to be limited to adjudicating disputes, if any, arising between the service providers and port users.

c) Tariff fixation should be based on the normative approach relying upon the standard capacity created and efficient cost of operating such facilities. The tariff guidelines of 2008 issued by the government for setting upfront tariff for PPP projects follow such a model and may, therefore, continue unaltered. However, retaining the upfront tariff unaltered for the whole project period needs to be re-examined. The guidelines may be amended to provide for periodic review of tariff, say once in five years, based on updated performance norms and capital costs.

d) The tariff guidelines of 2005, applicable to the major port trusts and private terminals that came into existence prior to 2008, require a thorough revision. Tariff fixing in these cases may also follow a normative approach which will act as an incentive to improve operational efficiency.

e) The operators may be allowed to retain the benefit of efficiency gain, provided tariff is set based on pre-determined standards instead of relying upon their own past performance and their projections for the future.

f) Regulatory approvals may be granted in a time-bound manner and towards this end, the regulatory process should be streamlined including adequately strengthening administrative and statutory aspects of regulatory organisations.

8.3.4.1.4 Ensuring at least 90 per cent of land is acquired before tendering

8.3.4.1.4.1 Pre-conditions for tendering PPP and EP&C projects can include acquiring 80 to 90 per cent land, including the tracts indispensable for normal progress of construction work. The land should be considered “unencumbered land” only when it is free from any dwellings or other physical encumbrance. Contractual mechanisms (such as a penalty clause) should ensure the relevant port trust’s continual commitment to land acquisition even after the award. The penalty calculation should ideally be unambiguous and similar to that of liquidated damages (a fixed quantum of penalty for each day of delay). Penalties should adequately cover typical extension costs, and could be capped in a similar way as liquidated damages payable by the provider.

8.3.4.1.5 Selecting design and engineering consultants based on quality-cum-cost based assessment

8.3.4.1.5.1 Paid consultants help to prepare most DPRs and can impact the time and cost of project execution. It is important to select technical consultants using a **quality-cum-cost based assessment (QCBA)** instead of the traditional L1 based (lowest cost) approach. The quality score should count for at least 50 to 80 per cent of overall assessment (as in Canada and the USA). Evaluators can rate the consultant through feedback from the respective port trusts about his or her performance on previous and ongoing projects. The port trusts, in turn can assess performance in a standard manner across projects using a set of standard guidelines with objective scoring parameters. For instance, evaluators can look at the magnitude of design changes during project execution and the reasons for the same.

8.3.4.1.6 Launching a construction-focused vocational training programme

8.3.3.1.6.1 The government must tackle the manpower shortage by creating additional training capacity to generate another 2 million to 3 million skilled workers per year by 2017. To build such scale, private capital will need to participate through commercially viable PPP models. The government could contribute partial equity and real estate for these projects to enhance their viability. The government should also ensure the commitment of the construction industry to five distinct areas:

a) **Improving faculty training:** Industry players and associations have the right expertise to run courses to train adequate faculty for this programme

b) **Setting progressive, modular standards for each skill type:** These standards should have broad-based relevance, and become a reference point for setting the curriculum

c) **Improving certification:** Set certification standards and guidelines, emphasising actual skills displayed over theory-based testing. Further, the industry should participate in the actual certification process to ensure quality

d) **Providing apprenticeship:** On-the-job training should be an integral part of the course curriculum, as in developed countries. Institutes can have formal tie-ups with local providers for systematically providing apprenticeship

8.4 Improving Operational Performance

8.4.1 Operational performance indicators can help enhance port performance by identifying areas for closer attention. The next step is to collaborate with all stakeholders to facilitate the working of operational areas under their control. Together, these attempts can significantly improve operational performance at India's ports.

8.4.2 Key performance indicators at Indian ports

8.4.2.1 Ports serve different objective functions during various stages of maturity (see Exhibit 3). This begins with ports that are economic lifelines, providing low cost of import and export cargo. The highest port objective is to limit the environmental impact for all its stakeholders. Certain key operations-related KPIs indicators help to measure and improve operational performance at ports.

EXHIBIT 3

Leading KPIs to monitor port objectives

Operations -related KPIs

Port objectives (hierarchical)	Leading KPI
1 Low cost of import/export	Cost per ton of import/export
2 Fast cargo transit	Cargo dwell time
3 Fast vessel turnaround	Vessel turnaround time
4 Optimum asset utilisation	Asset utilisation/productivity
5 Contribution to employment and economic value for nation	Number of jobs or amount of value added per ton of goods handled
6 Maximum shareholder return	Return on invested capital
7 Minimum environmental impact	Emission per ton of goods handled

8.4.2.2 Three of these leading KPIs are relevant in port operations: fast cargo transit, fast vessel turnaround and optimum asset utilisation. Each has its own performance drivers and parties involved in the outcome. And each can be broken down to a set of derived KPIs for better and easier monitoring (Exhibit 4)

EXHIBIT 4

KPIs derived from operations-related performance indicators

Leading KPI	Performance drivers	Derived KPIs	Parties involved
1 **Cargo dwell time** (excluding vessel related time)	▪ Terminal management system (IT system and yard operating system) ▪ Dwell-time incentives (free storage time)/ customer preferences (to use port as forward storage location) ▪ Customs clearance process	▪ Vessel pre-berthing time ▪ Yard dwell time ▪ Gate transit time	▪ Customs/port authority ▪ Terminal operator, customs, cargo owner ▪ Customs, shippers
2 **Vessel turnaround time**	▪ Amount of traffic to be loaded/ unloaded ▪ Distance from anchor point to berth ▪ Efficiency of port service operators (tugs/pilots) ▪ Efficiency of terminal operator (working hours, number of cranes, crane speed)	▪ Pre-berthing time (hours) ▪ Berthing time/unit of cargo handled ▪ Post-berthing time	▪ Customs/port authority (service providers) ▪ Terminal operator
3 **Asset utilisation**	▪ Handling equipment (number of cranes, crane spacing, crane speed, operating hours) ▪ Yard storage system (RMG, RTG, straddle carrier, forklifts, etc.) ▪ Amount of cargo throughput	▪ Cargo throughput (TEU/ton) per quay meter ▪ Cargo throughput (TEU/ton) per hectare of land	▪ Terminal operator (quay design parameters) ▪ Terminal operator (yard design parameters)

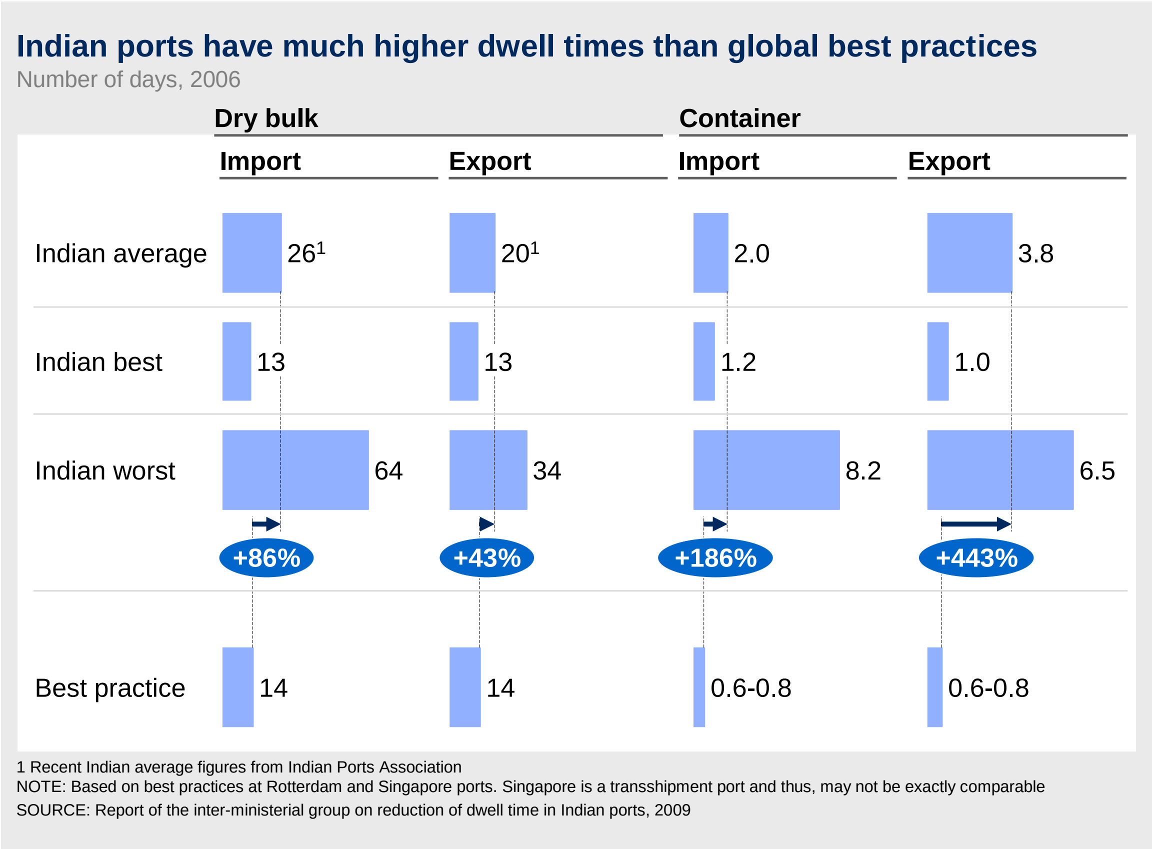
SOURCE: Team analysis

8.4.2.2.1 Cargo dwell time

8.4.2.2.1.1 Cargo dwell time, or transit time, consists of the time before the ships are allowed to berth, the time they spend unloading and loading, and the time the cargo spends in the yard before being picked up or dropped off by shippers in the port. Parties involved in the overall dwell time of the cargo are the customs authority (clearance process), port authority (vessel planning), terminal operations (lean handling) and shippers (port as inventory stock). Any cuts in cargo dwell time can reduce the inventory cost of shippers. Good information management systems, incentives to limit extra storage time and smooth customs operations processes are all drivers of shorter dwell time.

8.4.2.2.1.2 The average Indian port lags far behind on international best practice in this KPI – with the dwell times of both container and bulk cargo at least double that of international best ports (Exhibit 5). While the best performing Indian ports are in line with international best practice, the worst performers in India are 2 to 10 times worse.

EXHIBIT 5



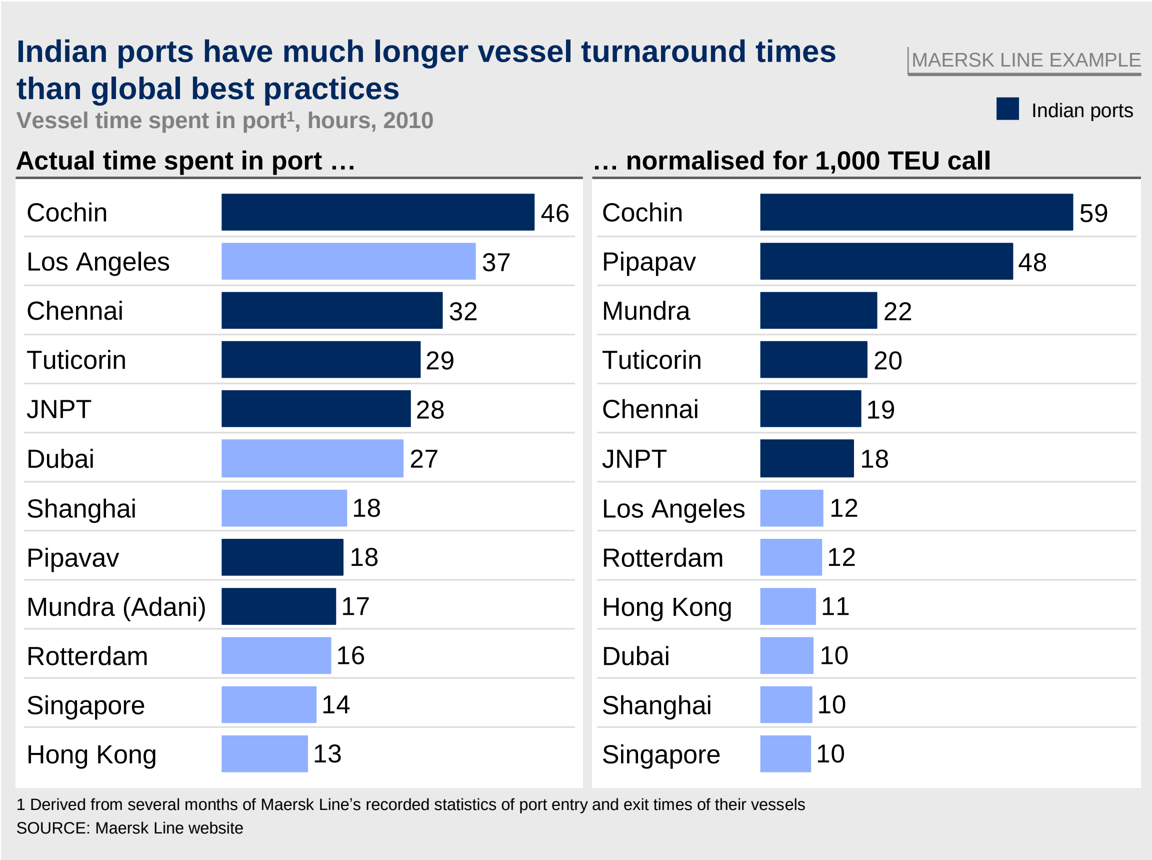
8.4.2.2.2 Vessel turnaround time

8.4.2.2.2.1 This is the time needed for loading, discharging and servicing a vessel from berthing until its departure. The main parties involved in vessel turnaround are the port authority and the terminal operators. Seamless communication between these parties and the ship operators is essential for a quick vessel turnaround process.

It is important to monitor both pre-berthing and post-berthing times as part of vessel turnaround time. Any delay can run up exorbitant additional demurrage costs. Important drivers of vessel turnaround time are the amount of traffic to be loaded or unloaded, distance from anchor point to berth, efficiency of port authority in pilotage/tugging and the efficiency of terminal operator in handling the vessel.

8.4.2.2.2.2 Indian ports have huge potential to reduce the average time a vessel spends in the port as compared to international best practice (Exhibit 6). To a certain extent scale plays a role here, but even ports at scale like Mumbai (JNPT) and Chennai have 50 to 100 per cent higher turnaround times than international best practice ports like Singapore and Rotterdam.

EXHIBIT 6



8.4.2.2.3 Asset utilisation

8.4.2.2.3.1 High productivity of port assets (such as quay and land) plays an important role in vessel turnaround time and cargo dwell time at ports. Asset productivity is also important given the ultimate public ownership of ports and therefore the return on capital of assets. Productivity, however, can be constrained by bottlenecks, which usually lie in quayside operations – the most expensive element of overall costs. On rare occasions, the bottleneck can also lie in yard layout or extreme water and soil conditions that hamper berth construction.

8.4.2.2.3.2The main parties that manage asset productivity are the terminal operator and the port authority. While the port authority is mainly involved in the design phase around the layout of the port and the location of the terminal, the terminal operator is responsible for the terminal layout and production system (quay and yard cranes).

8.4.2.2.3.3 Indian container terminal operators are lagging behind their international peers in operational efficiency, in terms of TEU throughput per meter of quay (Exhibit 7). This is due to a combination of crane spacing (average distance between cranes) and the productivity of individual cranes. Large-scale Indian container terminal cranes should be able to run at 170,000 to 190,000 TEU per crane, whereas smaller ones should at least be able to achieve a 100,000 TEU per crane number. Crane spacing in India should be reduced to approximately 80 metres for larger operations to 100 to 120 metres for smaller terminals.

EXHIBIT 7

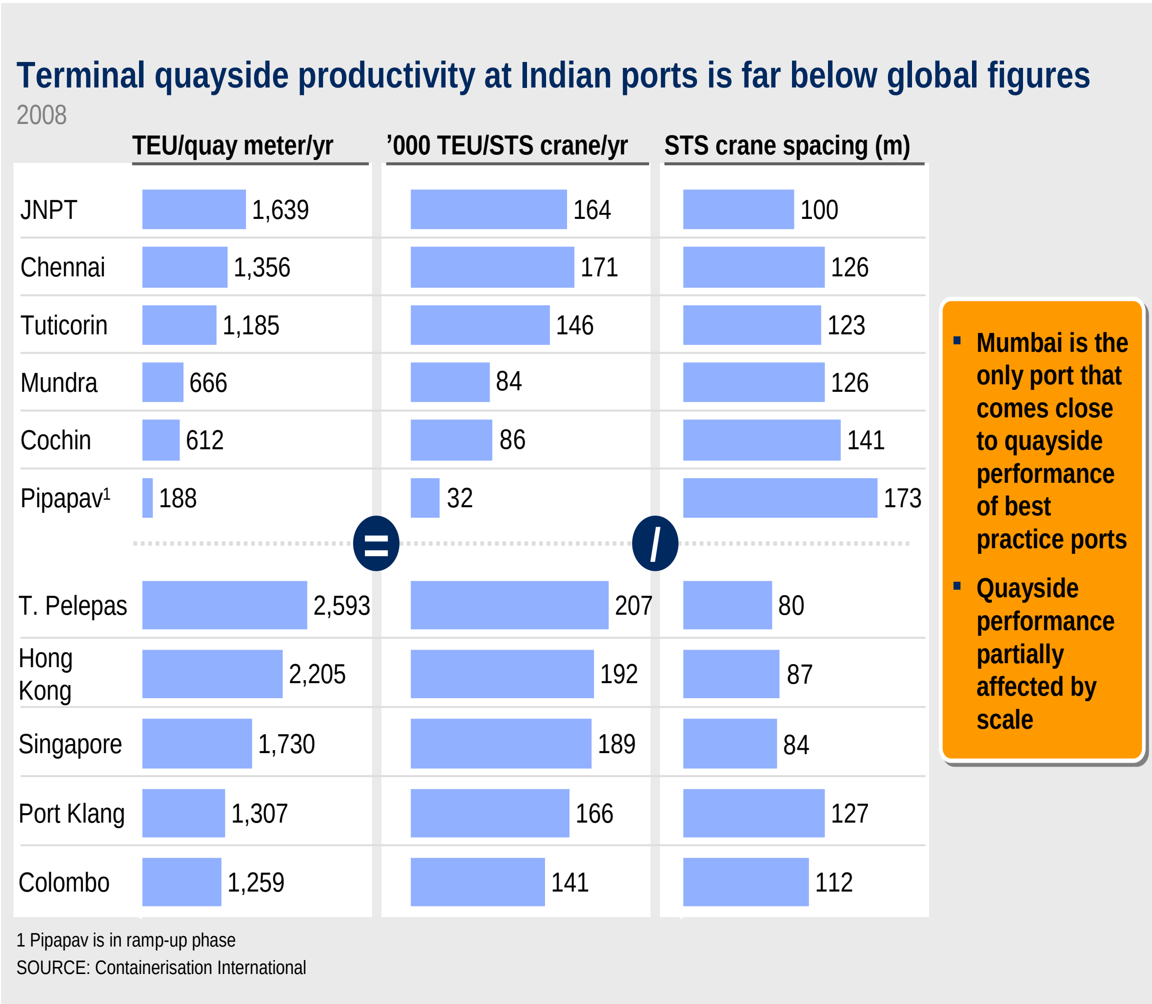
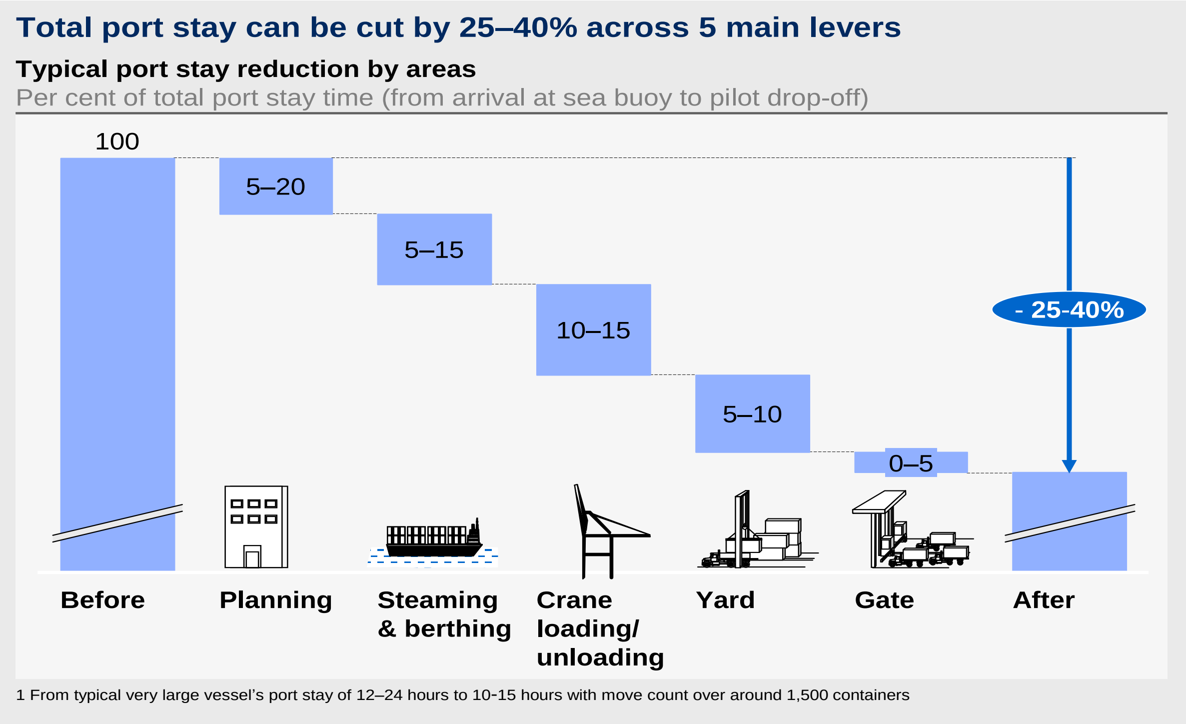


EXHIBIT 8



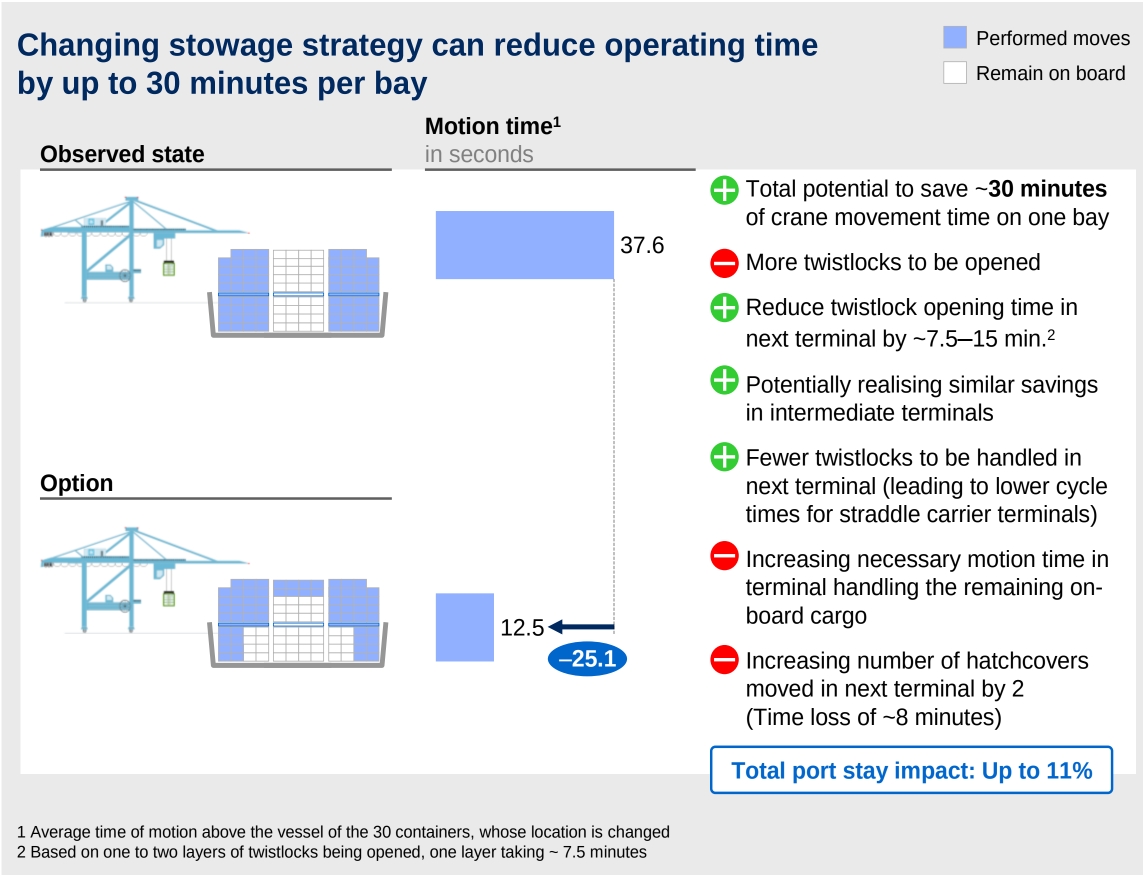
8.4.3 Levers to improve port performance

8.4.3.1 Optimising the vessel handling process end-to-end can reduce the port stay time of a vessel by up to 40 per cent (Exhibit 8). Five stages of a vessel's port stay need close attention in this context: planning, steaming, handling, yard, and gate operations. The port authority, terminal operators and shipping lines must collaborate to achieve this.

8.4.3.1.1 Improving the port planning process

8.4.3.1.1.1 Better planning, coordination and communication ahead of the vessel's arrival in a port can help save 5 to 20 per cent on total port stay time. The two most critical aspects in the planning process are that: (a) The terminal operator evenly distributes cranes alongside the vessel so that they all finish around the same time and; (b) The shipping line allows for a more flexible stowage plan on board to prevent unnecessary moves and downtime (Exhibit 9)

EXHIBIT 9



8.4.3.1.2 Optimising the steaming and berthing process

8.4.3.1.2.1 Optimising this process for container ships can save 5 to 15 per cent of total port stay time. The most important levers in this process are:

i) Orchestrating the arrival of the pilot at the waiting station to limit unnecessary waiting time

ii) Levelling the schedule to allow vessels to arrive at non-peak times

iii) Optimising the arrival and departure process by executing certain activities in parallel instead of in sequence

iv) The local port authority controls the arrival time of the pilot, but the shipping lines can control the other two levers.

8.4.3.1.3 Facilitating crane loading/unloading

8.4.3.1.3.1 Efficient crane loading and unloading can cut port stay times by 10 to 15 per cent. This requires:

a) Creating faster availability of cranes once operations are ready to start

b) Deploying the right type of cranes and drivers at the correct bays of the vessel to ensure highest productivity levels

c) Making abundant trucks (or other equipment like straddle carriers) available at the quay crane to transport the containers to the yard, thus minimising crane waiting time

d) Optimising the shift-change process (hot seat change) so that new driver seat is already installed before shift change takes place

8.4.3.1.3.2 The container terminal operator has complete control over these levers. But if the operator and the shipping company don't align their incentives, it becomes harder to notify and implement these levers.

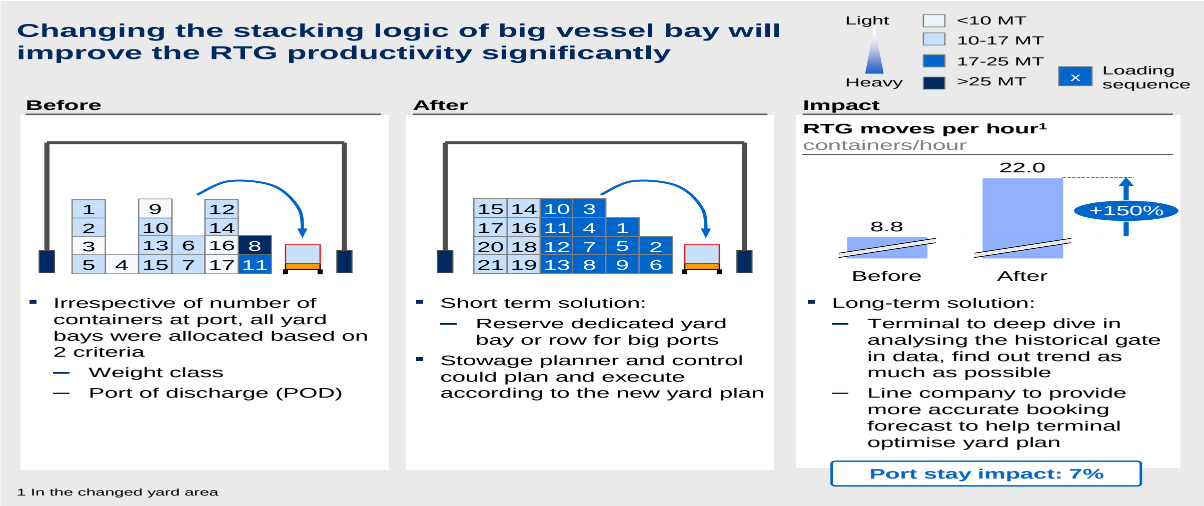
8.4.3.1.4 Streamlining yard operations

8.4.3.1.4.1 Better yard layout and production process (storage and retrieval of boxes) can save 5 to 10 per cent on existing timelines. This involves:

i) Improving stacking logic of fast moving container flows (large vessel bays) versus slower moving flows (Exhibit 10)

ii) Optimising stacking logic to limit the distance a crane must cover to retrieve a container

EXHIBIT 10



8.4.3.1.5 Easing gate operations

8.4.3.1.5.1 This doesn't directly create any savings potential for shipping lines or terminal operators, but it reduces the dwell time of the cargo for the shipper and limits the duration for which shippers need to hire the truck driver. It is estimated that a maximum of 5 per cent savings if the port focuses on: (a)Avoiding non–value added activities at the gate; (b) Arranging better arrival/departure pattern of incoming and outgoing trucks and containers to smooth peak loads

8.4.4.Improving operational performance by involving all stakeholders

8.4.4.1 The right approach is critical in successfully improving operational performance. This requires involving all stakeholders through a systematic transformation programme in order to substantially improve the operational performance of Indian ports.The four main stakeholders in port productivity improvement process are the government (either directly or through the port authority); the shipping lines; the terminal operators; and the cargo owners or shippers. Each stakeholder has a specific and critical role in accelerating performance:

i) Government and/or port authorities have to make sufficient pilots/tugs available to bring vessels to their berths with minimal delay. They must also ensure clearance of cargo in the ports to limit the dwell time of these goods inside the port.

ii) Shipping lines need to clearly align and communicate with terminal operators around their port arrival planning and preferred handling process. This enables terminal operators to turn their vessels around in the fastest possible time.

iii) Terminal operators need to ensure transparent communications, apply leaner operations in berthing, loading/unloading and yard operations processes, and facilitate faster exit/entry at the terminal gate.

iv) Shippers need to limit the dwell time of the cargo inside the port. This leads to a higher turnover rate and improved use of assets.

8.4.4.2 A programme that brings in the right organisational structure, clear processes, required skills and appropriate tools is critical in improving the operational performance of Indian ports. Such a programme usually consists of four steps; determine the base line; do a diagnostic on improvement potential; idea generation; and implementation. It takes several months to complete, and its success requires a strong focus on the following key success factors: (i) Commitment from management: target setting and responsibility; (ii)Clear transformation plan driven by the programme management office and; (iii)Incentives and disincentives based on performance

8.4.4.3 A sustained focus on all three key performance indicators can drive high operational efficiency at ports. All four major stakeholders must collaborate to ensure optimum utilisation of existing capacity. This can help our ports effectively manage ever-increasing freight traffic.

Chapter 9: Shipping

9.1 Introduction

9.1.1 Shipping plays an important role in the transport sector of India's economy. Around 95% of India's merchandise trade by volume (70% in terms of value) is moved by sea. India has one of the largest merchant shipping fleet among the developing countries and is ranked 16th in the world in terms of gross tonnage under its flag. Indian maritime sector facilitates not only transportation of national and international cargoes but also provides a variety of other services such as cargo handling services, shipbuilding and ship repairing, freight forwarding, light house facilities, training of marine personnel, etc.

9.2 Status of Indian Shipping

9.2.1 As on end March, 2011 India had a fleet strength of 1071 vessels with gross tonnage (GT) of 10.45 million (Table 1). Out of these 1071 vessels, 722 vessels (67%) with 1.02 million GT (9.8%) were engaged in coastal trade and the remaining 349 vessels with 9.43 million GT were deployed for overseas trade. Thus the tonnage deployed for overseas trade is 90% of Indian GT in contrast to only 10% of the tonnage deployed for coastal trade. The Indian Shipping tonnage which was stagnating between 6-7 million GT till June, 2004 has increased to 10.45 million GT by March 2011. The major share of Indian tonnage belongs to Shipping Corporation of India, a Public Sector Undertaking whose share is 33.3 %(3.15 million GT with 83 vessels).

9.2.2 A detailed analysis of the fleet classified by the type of vessels in 2011 indicates that the maximum number of vessels (211) were Off-shore supply vessels followed by tankers(142). In terms of GT, the 55% of the Indian tonnage (5.76 million GT) was in the category of Oil Tankers, whereas OSVs and Tugs accounted for higher number of vessels (389) but contributed a mere 2.75 % (0.28 million GT) of the total tonnage. The share of the tonnage contributed by Dry Cargo Liners has declined from 9% in 1999 to 8% in 2011, whereas the tonnage share of Oil Tankers has increased from 48% to 55% over the same period. The tonnage share of Bulk Carriers in total tonnage has also shown a significant decrease in total tonnage share from about 38% to 29% over the same period.

Table 9A : Growth of Indian Shipping (as on end March,2011)						
Year	Coastal		Overseas		Total	
	Ships	G.T.	Ships	G.T.	Ships	G.T.
01-04-1971	66	2,30,822	184	2,21,3749	250	24,44,571
01-04-1981	59	2,49,633	331	54,94,887	390	57,40,520
01-04-1991	163	5,23,733	255	55,15,587	418	60,39,320
01-04-2001	316	6,97,242	230	61,19,357	546	68,16,599
01-04-2010	678	9,99,430	327	86,89,133	1003	96,88,563
31-03-2011	722	10,24,674	349	94,25,631	1071	104,50,305
Source: Various Issues of Review of Maritime Transport, UNCTAD						

9.2.3 India's compounded annual growth rate (CAGR) in shipping as per the national flag registrations (in terms of GT) from 1980 to 2010 has been much lower compared to growth in tonnage at global level, for Asia and particularly of our competitors like Korea, China etc. This has lead to low share of Indian tonnage at a global level (Table 9B).

Table 9B : Compound Annual Growth Rate (CAGR) in Tonnage: Select Countries & World							
Country	1990/1980	2000/1990	010/2000	2005/2000	2010/2005	2005/1980	2010/1980
World	0.1	2.9	4.6	3.5	5.8	1.9	2.5
India	0.9	0.3	3.0	3.8	2.2	1.3	1.4
China	7.3	1.7	6.2	6.2	6.2	4.8	5.0
Korea	6.0	-2.2	7.6	8.3	6.9	3.1	3.7
Asia	6.9	3.8	7.0	7.5	6.5	5.8	5.9
Source: Based on data contained in Issues of Review of Maritime Transport, UNCTAD							

9.1.4 Tonnage in terms of GT and its distribution across developed, developing, open registries and select countries is given in Table 9C.

Table 9C : World Shipping Fleet (Thousand GT) January 2010.						
	1980	1990	1995	2000	2005	2010
World	419911	423627	490662	561585	665506	882635
Asia	33682 (8.0)	65653 (15.5)	81500 (16.6)	95477 (17.0)	137186 (20.6)	187530 (21.2)
India	5911 (1.4)	6476 (1.5)	7127 (1.5)	6692 (1.2)	8079 (1.2)	9027 (1.0)
Singapore	7664 (1.8)	7928 (1.9)	13611 (2.8)	21531 (3.8)	30823 (4.6)	41047 (4.6)
China	6874 (1.6)	13899 (3.3)	16943 (3.5)	16501 (2.9)	22286 (3.3)	30077 (3.4)
HongKong	1717 (0.4)	6565 (1.5)	8795 (1.8)	10595 (1.9)	29851 (4.5)	45338 (5.1)
Korea	4344 (1.6)	7783 (1.8)	6972 (1.4)	6200 (1.1)	9250 (1.4)	12893 (1.5)
Figures in parenthesis indicate share in the total Source:Various Issues of Review of Maritime Transport,UNCTAD						

9.3 Age structure of Indian Tonnage:

9.3.1 The age structure of Indian vessels shows the over-aged profile of the Indian fleet. It indicates that more than 40% of the fleet is above 20 years of age, and about 21% in the age group of below 5 years (Table 9D). In contrast, age profile of the world fleet (as per the Review of Maritime Transport [(RMT) 2010] reflects that more than 50 % of the global tonnage was less than 9 years of age.

Table 9D : Age Composition of Indian Shipping Fleet						
Age Composition of Indian shipping Fleet (as on 31st March 2011) (Average age - 17.9)						
Category	**0-5 years**	**6-10 years**	**11-15 years**	**16-20 years**	**Above 20 years**	**Total**
Coastal	131(18.1)	76(10.5)	100(13.9)	84(11.6)	331(45.8)	722(100.0)
Overseas	93(26.6)	39(11.1)	33(9.5)	54(15.5)	130(37.3)	349(100.0)
Total	224(20.9)	115(10.7)	133(12.4)	138(12.9)	461(43.1)	1071(100.0)
Source: Indian National Shipowners Association						

9.3.2 The age profile of the world shipping fleet is younger than the age profile of the Indian shipping fleet, hence leading to higher efficiency and productivity of the tonnage.

9.4 Composition of Indian Tonnage

9.4.1 Composition of tonnage of merchant fleet for India shows overwhelming share of oil tankers (55%) followed by bulk carriers (26%), with container ships accounting for mere3% share in the total tonnage. In contrast, the tonnage composition of China reflects44% in bulk carriers followed by 18% in oil tankers and about 15% in container ships. The composition of world tonnage shows 29% share of bulk carriers, 28% share in oil tankers and 17% share in container ships (Table 9E)

Table: 9E: Composition of Merchant Fleet(Thousand GT)

Country	**Bulk carrier**	**Container**	**General cargo**	**Oil tankers**	**Others**	**GT**
India	2377 (26.3)	254 (2.8)	322 (3.6)	4972 (55.1)	1102 (12.2)	9027 (100.0)
China	13315 (44.3)	4393 (14.6)	4702 (15.6)	5446 (18.1)	2221 (7.4)	30077 (100.0)
Hongkong	22366 (49.3)	8745 (19.3)	2742 (6.0)	10315 (22.8)	1170 (2.6)	45338 (100.0)
Korea	7864 (61.0)	688 (5.3)	1334 (10.3)	1374 (10.7)	1633 (12.7)	12893 (100.0)
Malaysia	290 (3.8)	703 (9.1)	496 (6.4)	2938 (38.1)	3292 (42.6)	7719 (100.0)
Developing countries	69345 (32.2)	28306 (13.1)	31834 (14.8)	59476 (27.6)	26459 (12.3)	215420 (100.0)
Developed	27590 (15.3)	39408 (21.8)	23701 (13.1)	50674 (28.0)	39406 (21.8)	180779 (100.0)
Open Res.	154404 (32.9)	77515 (16.5)	46209 (9.8)	137688 (29.3)	54000 (11.5)	469816 (100.0)
World	253191 (28.7)	145544 (16.5)	107591 (12.2)	250999 (28.4)	125310 (14.2)	882635 (100.0)

Source: Review of Maritime Transport,2010,UNCTAD

9.4.2 India is amongst the few nations who have not experienced “flagging out” or migration to flags of convenience or open registries. In case of India, the share of foreign flags in its total fleet is around 17% compared to 92% for Japan, 61% for China, 58% for Korea,87% for Taiwan and 29% for Malaysia as on beginning 2010 (Review of MaritimeTransport, UNCTAD,2010). The share of Indian registered ships in conveyance of India's overseas merchandise trade has fallen to around 8 per cent.

9.5 Investment in Shipping Sector

9.5.1 During the first four years of 11th Five year Plan , the number of ships acquired and investment made in acquisition of ships made by 10 Indian Shipping companies which constitute about 68.4% of the total Indian tonnage is given in Table 9F.

Table 9F : Investment in Indian Tonnage

	2007-08	2008-09	2009-10	2010-11
No.	33	29	16	21
Total GT	1065643	639338	292345	1088939
Total DWT	1872693	1144405	504270	1886195
Total cost of Purchase (in Rs. Crore)	5865.04	5050.08	1928.55	4132.17

Source:INSA

9.6 Building Seaborne Trade Infrastructure

9.6.1 In discussing maritime transport, a distinction must be made between the owner of the ship on the one hand and the owner of the cargo on the other. The two are rarely the same. Prior to 1973 (first oil crisis) most oil companies owned maritime transport subsidiaries. Today major oil producers outsource maritime transport to specialist companies who are more flexible in their organization.

9.6.2 Over the years the share of Indian cargo being carried on Indian registered vessels has steadily fallen and now stands at around 8 %. Indian tankers now lift only 14.5% of the oil shipped to the country (Table 9 G). In the absence of a domestic fleet capable of transporting the growing levels of imports required, India has increasingly relied on foreign-flag ships to service its needs.

Table 9G: Share of Indian Tonnage across Cargo Categories (Million Tonnes)					
Year	**General Cargo**	**Dry Bulk**	**POL**	**Indian Lines**	**Total***
1999-00	2.94 (7.3)	11.95 (14.4)	55.96 (55.0)	70.85 (31.5)	224.62
2000-01	3.54 (8.3)	11.10 (12.2)	40.02 (36.2)	54.66 (22.4)	244.33
2001-02	3.34 (5.9)	7.80 (7.6)	35.16 (30.9)	46.30 (17.0)	273.04
2002-03	2.89 (5.6)	9.38 (7.9)	30.16 (27.4)	42.43 (15.1)	280.34
2003-04	6.15 (7.4)	8.14 (6.3)	30.15 (22.5)	44.32 (12.8)	346.32
2004-05	7.56 (8.0)	7.82 (5.0)	39.50 (26.6)	54.89 (13.7)	400.58
2005-06	4.72 (4.6)	15.12 (8.1)	42.48 (26.1)	62.31 (13.8)	451.39
2006-07	4.6 (3.6)	12.13 (6.3)	44.14 (24.7)	60.86 (12.2)	497.81
2007-08	5.8 (3.7)	14.5 (6.8)	34.3 (16.4)	54.60 (9.5)	576.30
2008-09	4.02(2.7)	11.34(4.8)	33.96(15.3)	49.31(8.1)	611.04
2009-10	5.20(3.5)	13.10(4.7)	37.89(14.5)	56.20(8.1)	692.00
* Total overseas cargo carried on Indian & foreign lines; figures within parenthesis indicate percentage share of respective cargo category carried by Indian registered ships.					

9.7 Shipping freight rates and importance of development of Indian shipping

9.7.1 Shipping is the lifeline of a nation, necessary for the development of the national economy as well as to keep the supply line open for transportation of essential commodities during peacetime and emergencies such as war and famine. India has an extensive coastline with 13 major ports and about 185 minor and intermediate ports. Around 95% by volume (68% by value) of India's EXIM trade moves by sea. The average age of Indian fleet is around 18 years, it requires a major fleet replacement programme over the next 5 years. The overall share of Indian ships in the carriage of the country's overseas seaborne trade has been declining over the years. From about 40% in the late 80s, it is currently around 8% which is a matter of great concern, as it entails heavy outgo of foreign exchange in terms of freight bill that goes to foreign companies and India stands to lose not only the foreign exchange on the freight but also the multiplier effect that would accrue to the economy.

9.8 Need for National & Energy Security

9.8.1 Besides, the economic impact, the role of Indian shipping in the national and energy security is **vital.** The ownership and operation of Indian vessels in Indian trade offer high security due to the following reasons:

a) An Indian vessel has to be mandatorily "flagged" in India and its inspection, certification and operation are under the direct control of the Directorate General of Shipping in India.

b) An Indian vessel has to be manned and operated by Indian nationals. The identification, certification and security clearances of these officers and seamen are under the direct control of the Directorate General of Shipping in India.

c) In India, vessels can always be "requisitioned" for Indian trade in the event of national emergency. This provision of the Merchant Shipping Act ensures that critical energy cargoes can always be imported/transported during war/national emergency.

d) When Indian shipowners deploy a specialized / technical officer who is not of Indian origin, on board any of our vessels trading on the Indian coast, they are required to seek clearance not only from the Naval authorities but also from MoHA (Ministry of Home Affairs). However, when foreign flag vessels (other than offshore vessels) trade on the Indian coast, no Naval or MoHA clearance is required. It is, therefore, essential that the ownership and operation of Indian shipping should be encouraged.

9.9 National tonnage and its effect on freight rates

9.9.1 The existence of a strong and viable national fleet serves as a balancing factor in the volatile freight market and helps to keep down the freight rates in the shipment of export and import of goods and maintain competitiveness of exports.

9.9.2 Advantages of Increased National Tonnage : Increase in tonnage for the growing economy is important for the following reasons:

a) Promotes foreign exchange earnings as it reduces outgo on account of freight transportation through foreign vessels. India's total payments on account of sea transportation covering charter hire charges, freight on iimports and exports is estimated at US$ 5.4 billion of which around US $ 5.3 billion was paid towards freight charges (US $ 4.2 Billion on freight imports and US $ 1.1 Billion on freight exports) in 20010-11 as per the by the Reserve Bank of India (Table:9I).

b) National tonnage provides leverage over ocean freight rates which have traditionally been subject to collusive/negotiated price setting mechanisms.

c) National tonnage help spawns associated shore based services, such as stevedoring, ship repairs, logistics, manning, cargo movement etc.. The Shipping sector constituted 2.5 - 3% of the GDP, according to Rakesh Mohan Committee Report.

d) It provides higher employment opportunities for Indian seafarers. India has about 30,000 officers and 2,30,000 ratings.

e) Having more ships under the Indian flag, will provide bigger opportunities for training of Indian seafarers.

f) Addresses National Security Concerns: National tonnage maintains the supply line for essential cargoes, in emergency situations. For example, 100% of the total crude imports from the Middle East during the Iraq war came on Indian ships.

9.9.3 Strategy for Augmenting Indian tonnage : Apart from direct acquisition of new tonnage with emphasis on adequate tonnage towards fulfilling energy security needs over a medium term, domestic tonnage can be augmented in the interim and short run through a combination of policies aimed to:

i) Retain and consolidate existing tonnage from flagging out to more attractive registers through greater cargo support and

ii) "Deemed Export Status" for Shipping

iii) Make investment in Shipping at least as profitable as any other service industry by offering a conducive tax regime encompassing both direct and indirect taxes;

iv) Explore and exploit new/innovative cost effective Charter Hire arrangements.

9.10 Greater Cargo support and development

9.10.1 In order to ensure the development of an Indian fleet in adequate strength for the transportation of country's domestic and exim trade, the Indian shipping industry has reiterated the need for a strong cargo support policy. In many countries preference is given to the national fleet for carriage of government procured cargoes. Typically the national fleet will have the first right of refusal and only then will foreign flagged ships be allowed to participate in the carriage of such cargoes, unless a waiver is granted to foreign flag ships registered with the maritime administration of the country concerned. Cargo preference or preferential treatments are powerful instruments because they put vessels from other countries at a disadvantage, by reducing or completely excluding them from participation in the external trade of the country. Some of the examples of cargo support policies pursued by other nations in the past and present are: U.S. has reserved government cargoes, such as all of its aid cargoes, project cargoes financed by Export and Import Bank of the United States (EXIM) and export of Alaskan oil, for its own ships; In the past Korea has followed a designated cargo preference system for bulk cargoes and a waiver system for liner cargoes.

9.10.2 Many countries including India has used the strategy of "Buy FOB and sell CIF" i.e. encouraging exporters to sell CIF or C&F and for its importers to buy FOB to lend support to domestic tonnage and also as an effective bargaining instrument in international trade wherein, by splitting the CIF costs of imports into components, the buyer can hedge for separate bargains with sellers of commodities and providers of freight and insurance companies to extract overall cost advantage. It transfers the right to designate the carrying vessel to the local seller or buyer. Any economic gains made through the policy of cargo reservation/support would have to be assessed against these invisible costs. However, keeping in view that the component of sea freight in the total cost of Crude and Products are respectively 0.75% and 1.4% , a small increase in sea freight, if at all, will have only very small or no major impact on the price of the crude being imported or products being sold.

9.10.3 Cargo Support on EXIM Trade

9.10.3.1 Based on the statistical data available from Ministry of Commerce, **the top 4 cargoes in India's imports are**: (i) POL (Petroleum, Oil and Lubricants including Crude) (~30%), (ii) Solid Bulk Cargoes (Coal, Fertliser, etc.) (~12%); (iii) Engineering Goods and Machinery (~10%) and; (iv) Electronic goods (~6%). **The major items exported are:** (i) Engineering Goods and Machinery (~23%), (ii) Petroleum products (~17%); (iii) Chemicals & related products(~12%) and (iv) Agricultural products(~7%).

9.10.3.2 The shipping industry has been reiterating that EXIM cargoes moved on account of the government should be transported on Indian flag vessels whenever Indian flag vessels are available through the policy of FOB purchase (import) and CIF sale (Export) and the right of first refusal (ROFR) to Indian flag vessels with a view to exercising shipping control over Indian cargo. Chartering wing of the shipping ministry (Transchart) needs to continue to make the shipping arrangements for all the government cargoes. Allowing oil companies the freedom to make their own shipping arrangements since 2005 has resulted in multiplicity of agencies handling government cargo and needs a review to bring all government cargoes under a single umbrella. This change of the policy has neither resulted in reducing the cost of shipping nor in any increase in Indian participation. The shipping industry has also urged the government to encourage greater involvement of Indian vessels in EXIM trade and a cargo reservation policy to ensure that all essential cargoes like crude oil, petroleum products, and gas are carried by Indian flagged vessels. However, for Oil companies which charter vessels for transport of crude oil to Indian ports, there have been considerable financial savings after the Government allowed PSU oil companies for direct chartering of ships in 2005, instead of going through Transchart. Hence the proposal by shipping industry association for the reversal of this policy to pre-2005 arrangement, i.e., chartering through Transchart, is a step backward and hence not acceptable to them.

9.10.3.3 After careful consideration of the views of Indian ship owners as well as Indian charterers, there is **a need to reserve some portion of the POL and dry bulk cargoes of EXIM trade of India for Indian Ships, and should be linked as condition for availing benefits under the export schemes of the Government of India. This will assure cargo availability for Indian ships, and act as a catalyst to boost the growth of Indian fleet.**

9.11 "Deemed Export Status" for Shipping

9.11.1 As is known, majority of Indian shipping companies are tonnage tax companies and the essential requirement for tonnage tax benefits is that the place of effective management has to be in India. Management means the place where the commercial and strategic decisions are taken.

9.11.2 Given the international nature of its business, the shipping company provides such service for Indian companies either importing or exporting their cargo. It also provides its skill sets and its abilities to manage effectively transportations solutions to companies which are also situated outside India. However, what is important and paramount is that, at the outset, the service is provided from its office in India and effectively out of India. While providing such services, the equipments used for providing the services may or may not touch India. What is important is that the service is provided from India and the consumer sitting in a foreign country is importing this service from the Indian shipping company. The income earned by the Indian shipping company for the said purpose of transportation services is offered for taxation in India and is fully taxed under the relevant provisions of the Indian Income Tax Act. For such services, the Indian shipping company is paid in free foreign exchange or in INR which is otherwise considered as having been paid for in FFE by RBI. Sea transport earnings and payments by shipping companies in India are given in Table 9H below.

Table 9H : Sea Transport: Earnings and Payments (In US $ Million)

Items	**2007-08**	**2008-09**	**2009-10**	**2010-11**
A. Receipts				
i) Surplus remitted by Indian companies operating abroad	507	578	610	649
ii) Operating expenses of foreign companies in India	773	1023	788	765
iii) Charter hire charges	207	193	139	116
A.Total[i+ii+iii]	1407	1794	1537	1530
B.Payments				
i) Surplus remitted by Foreign companies operating in India	1663	1835	1208	1771
ii) Operating expenses of Indian companies abroad	901	1015	1671	962
iii) Charter hire charges	148	128	97	93
iv) Freight on Imports	2952	4062	3265	4186
v) Freight on Exports	779	1026	1018	1119
vi) Remittance of passage booking abroad	4	7	6	11
B.Total[i+ii+iii+iv+v+vi]	6447	8073	7265	8142
Source:RBI Monthly Bulletin, August 2011				

9.11.3 Indian shipping companies are exporting maritime transportation services to consumers out of India and are earning valuable foreign exchange as freight. It would therefore be just and sufficient to grant "**deemed export status**" to Indian shipping services and encourage the maritime transport service providers in building international competitiveness. The Indian shipping industry is competing against intense international competition despite the comparatively high taxation regime in the country and other constraints put on the Indian shipping industry. Consequently, all inputs in terms of machinery, stores, spares and other related equipments used for the purposes of effectively operating an Indian flag vessel providing such an International maritime transportation service should qualify for a similar deemed export status and consequently be made free of local duties and taxes. It is therefore proposed that the DGFT policy circular be suitably modified to grant deemed export status to "maritime transportation services" provided by Indian shipping companies from India.

9.12 Tax Issues & Incentives in Shipping

9.12.1 There are a variety of taxes besides the Tonnage Tax that the Indian Shipping companies are subject to at present. These together erode the benefit of lower incidence under the Tonnage Tax regime. Indirect Taxes has been summarized in the Tables 9I.

Table 9I : Indirect taxes levied on Indian shipping industry

No	Revenue streams	Service tax	VAT
1	Transport of coastal goods and transportation through national waterways	Liable with effect from 1 September 2009 at 10.3%. 25% abatement from service tax available with effect from 1 March 2011 subject to the condition that no CENVAT credit is available of taxes paid on inputs, input service and capital goods. Coastal transportation of specified goods including food stuffs, medicines, pharmaceutical products, petroleum products specifically exempt from service tax,	NA
2	International transportation of goods (voyage charter)	Currently not covered under the ambit of the Service tax law.	NA

3	Time charter arrangements for vessels plying in India	Liable to service tax as ‘Supply of Tangible Goods Services’.	There is a current ambiguity with respect to levy of VAT on time charter arrangements
4	Time charter arrangements for vessels plying outside in India	International time charter zero rated if they qualify as ‘export’ under the Export of Services Rules, 2005. Time charter between two Indian companies for international transportation may not qualify as export since the service recipient is located in India and consideration is not received in convertible foreign exchange and hence could typically attract service tax.	
5	Bareboat arrangement	No service tax if no services provided	VAT applicable if vessels provided in India
6	Cruise line services	Transport of persons embarking from any port in India, by a cruise ship liable to service tax	NA
7	Activities carried out in offshore India	With effect from 7 July 2009, the definition of ‘India’ under the Finance Act, 1994 was amended to include 'installations, structures and vessels in Continental Shelf and Exclusive Economic Zone of India' (ie up to 200 nautical miles from Indian base line). With effect from 27 February 2010, construction and operation of installations, structures and vessels for prospecting/ extraction/production of mineral oils and natural gas in continental shelf (ie up to 200 nautical miles) are covered under the definition of 'India'	NA

9.12.2 Direct Taxes has been summarized in the Tables 9J.

Table 9J: Key Direct Taxes Levied on the Shipping Industry	
Particulars	**Income-tax**
Income from surplus cash deployed/ maintained to buy new ship as per the requirement of usage/	A tonnage tax company is compulsorily required to maintain a reserve account and an amount not less than 20% of the book profits arising from 'core' and 'incidental' activities of the company are statutorily required to be transferred to such reserve account. The said reserve account has to be utilized towards acquisition of ships- Pending utilization, such cash are deployed in short-term money market instruments like banks, MFs and other similar instruments and income is generated as a result of deployment of cash, which forms an integral part of core shipping activity.
Minimum Alternate Tax (MAT) on profit/loss on sale of vessels.	The book profit on sale of qualifying ship is currently not covered as relevant Shipping income. Further, any profits or gains arising from transfer of qualifying/capital asset is chargeable to income tax as capital gains. When a qualifying ship/ asset is sold, due to 'block of assets' concept under the Act, such sale proceeds get reduced from the relevant block and may not affect the tax computation under normal circumstances. However, it affects tax computations for the purposes of MAT since the profit on sale of ship will form part of "book profit". Accordingly, the sale of qualifying ship is subject to MAT provisions.
Withholding Tax Liability on Interest Paid to Foreign Lenders	Remittance of interest on ECB loans taken on or before 1-6-2001 did not suffer any withholding taxes. However, the said provisions were amended and consequently the said exemption from withholding taxes was withdrawn in respect of ECB loans taken on or after 1-6-2001. Thus, presently, the interest paid by Indian shipping companies to foreign lenders on acquisition of ships is subject to withholding tax at the rate of 20% plus surcharge.

Seafarer taxation	Indian shipping companies have to mandatorily recruit Indian crew on ships with Indian flag. As per the current provisions of the Act, a seafarer serving on Indian ships outside India for a period of 182 days or more in a year, is considered to be a non-resident. Further, as per circular no 586 dated 28-11-1990, the period of ships in Indian territorial waters, would be considered as period of service in India. As Indian ships generally operate in Indian trades and Indian ship calls frequently at Indian ports, a large number of crew/ seafarer employed on Indian ships though trading outside India face difficulty in complying with the 182 days criteria for becoming a Non-Resident Indian status.

9.13 Service Tax

9.13.1 Presently a service tax is levied at the rate of 12% (effective rate 12.36% inclusive of education cess) on specified services. As per the rules service provider is entitled to recover this from the purchaser/end user/consumer on the services provided within the territorial jurisdiction of India. In India service tax is applicable on various services rendered to the shipping companies domestically. Further, services provided by 'non-resident' outside India and received/consumed/performed in India are subject to service tax (referred to as the 'reverse charge'). Based on the rules (notified vide Notification No. 11/2006 dated 19th April 2006), separate criteria is provided for determining the circumstances in which services can be construed as having been imported (i.e. received in India) and thereby the taxability/exemption of the same. As per these Rules, services availed outside India in relation to maintenance and repair, port dues, handling etc. are outside the scope of service tax if availed wholly outside India. However, these rules impose service tax on service received in India from overseas such as P&I insurance, brokerage/commission, consultancy, banking services, manpower recruitment, ship management services and are categorized under rule 3 (iii) of the said rules and are to be construed as received and consumed in India, if such services are received by a recipient located in India for use in relation to business or commerce.

9.13.2 Broadly there are 5 broad groups of services related to Maritime Sector, viz, Port Services, Ship Management, Steamer Agent, Dredging, Custom House Agent. In addition, there are other two services which are of omnibus nature, viz. Business Auxiliary Service, and Business Support Service. The services related to Ship Management are further classified into ten services as enumerated in the following paragraphs. Ship management services include: (i) the supervision of the maintenance, survey and repair of ship; (ii) engagement or providing of crews; (iii) receiving the hire or freight charges on behalf of the owner; (iv) arrangements for loading and unloading (v) providing for victualling or storing of ship; (vi) negotiating contracts for bunker fuel and lubricating oil; (vii) payment, on behalf of the owner, of expenses incurred in providing services or in relation to the management of ship; (viii) the entry of ship in a protection or indemnity association; (ix) dealing with insurance, salvage and other claims; and (x) arranging of insurance in relation to ship; (Section 65(96a) of the Finance Act, 1994).

9.13.3 Exporters presently get refund of service tax paid by them on input services used for exports. Government has issued a Notification providing refund of service tax paid by exporters on four taxable services (services offered to exporters by major ports, minor ports, road transport services provided by goods transport agency from inland container depot (ICD) to port of export and transport of export of goods in containers by rail from ICD to port of export) would now qualify for service tax refund.

9.13.4 In many of the maritime countries the shipping industry is not subject to service tax either domestically or internationally. In the European Union, United Kingdom, Ireland, Singapore and Australia, the services availed of by shipping companies are either exempt from service tax or zero rated. The ambit service tax exemption needs to be expanded to cover all marine services rendered in India and utilized by exporters. This would need list of such services on a verifiable basis to evaluate linkage of services with goods exported. Such shipping/marine services which facilitate exports and generate foreign exchange earnings could be exempted or zero rated. This will make such services price competitive**.**

9.13.5 Service Tax abatement

9.13.5.1 Presently the transportation of goods by road and railways enjoy 75% and 70% service tax abatement respectively from the value of freight. However, the transportation through coastal and inland waterways, which is, environment friendly and cost effective and infant industry, has been granted only 25% service tax abatement from freight value. Additionally, this abatement would require that the service providers cannot take any input credit of taxes. It is noted that this inequity between the service tax abatement for road/rail transportation and coastal transportation is iniquitous. Hence the percentage of service tax abatement for coastal and inland waterways transportation be increased from 25% to level on par with road and railway transportation. Further restriction on availment of input credit is withdrawn since this condition only adds to the already increasing input cost of such service providers.

9.14 Seafarer's Taxation-Unequal treatment

9.14.1 Indian seafarers employed on foreign vessels or Indian vessels which ply outside Indian territorial waters for 182 days or more in a year are entitled to non resident status and pay no taxes. This does not apply to officers and seafarers on coastal ships. Also Indian and foreign seafarers working in Indian territorial waters for 182days or more are effectively Indian tax residents and are liable to pay tax on income.Crewing costs are considered the dominant component of operating costs. The crewing costs of a ship are determined by several factors, such as the ship type, the trade, the level of automation, employment characteristics, the flag of registration, the nationality of the crew and the relief crew schedule. Every ship-owner attempts to achieve the optimum crew complement taking into account statutory requirements, and safety needs. The flag state stipulates the minimum national manning component of the ship's crew. The nationality of the crew is an important factor in determining crew costs. National crew costs in developed countries reflect the general social and wage conditions of these countries and are much higher than crew costs in developing countries.

9.14.2 It may be noted that certain countries in Asia (Malaysia, Phillipines, Singapore, and Thailand) have exempted income of their seafarers from personal taxation. In some European countries, ship-owners are given the right to withhold a certain percentage of personal income tax and social security payment of seafarers as an incentive to hire European seafarers by offsetting part of the high wage level in their country. Labour is a factor of production and seafarers income could be subject to a lower fixed/ flat rate of tax which could be levied on all Indian seafarers irrespective of their residential status (i.e. place of work within or outside Indian territorial waters) and/or flag of ship they work for or; a higher exemption up to a certain level of income could be given for tax purposes. Such a tax will reduce the attraction of foreign flag and may also help coastal shipping which find it difficult to engage and retain Indian seafarers under the existing manning laws.

9.15 Minimum Alternate Tax (MAT) on Profit/Loss on Sale of Vessels

9.15.1 In India, profit/loss on sale of vessels is not covered under the tonnage tax regime. Therefore, the tonnage tax company has to pay minimum alternate tax/capital gains tax on such income. Minimum Alternate tax (MAT) @ 11.22% is payable on book profits in case the taxable income (i.e. other than tonnage income) of the company is less than 10% of the book profits. The profit/loss on sale of vessel is credited to the profit and loss account and would be included in the book profits of the qualifyingshipping company on which MAT would be applicable.

9.15.2 In United Kingdom, Singapore, Ireland and Netherlands profit/loss on sale of vessels is covered under the tonnage tax regime. Thus, in the above jurisdictions the gain on sale of vessels will not be taxed under the normal corporate taxation rules. Given the need to augment the fleet capacity of the Indian Shipping it is suggested either to (a) to include surplus resulting from sale of vessels should be covered within the scope of tonnage tax regime or (b) exempt sale proceeds from tax if used to purchase a replacement vessel within a certain period of time.

9.16 Withholding Tax on interest payments to foreign lenders/external commercial borrowings (ECB)

9.16.1 Under the domestic law of India, any payment to a non-resident which constitutes taxable income is subject to withholding tax. The burden of such tax has to be ultimately borne by the borrower who makes payment of grossed up interest. Interest paid to an overseas lender is subject to withholding tax at the basic rate of20% as per the Section 195 of the Income Tax Act. The tax liability arising thereto can be borne by either the borrower or lender abroad depending on the terms of agreement between the two parties. The aforesaid tax rate would be in a case where the overseas lender is resident of a country with which India has not entered into a double taxation avoidance agreement. In case of other countries, the beneficial provisions of the Tax Treaty may be availed. The tax treatment would depend upon whether interest is covered under the specific Article dealing with 'shipping profits' or otherwise. In case it is covered under the said Article, the interest would be taxed in the similar manner as 'profits from operations of ships' are taxed; i.e. it would be taxed in the place of effective management/country of residence of the foreign lender. In other cases, in the absence of permanent establishment, it would be taxed as interest income. The concessional rate of tax for interest income provided under the Tax Treaty ranges between 10-15%. Subject to the domestic law of the country of residence of the overseas lender, credit can be claimed for the foreign taxes. Under the domestic law of Singapore, interest paid to foreign lenders is exempt from withholding tax. This is subject to the condition that the loan is utilized for purchase of vessels registered under the Singapore flag. Under the domestic law of United Kingdom, interest paid to foreign lenders is subject to withholding tax at the rate of 20%. In case there is a Tax Treaty, the beneficial provisions of the same may be availed of. The implication of withholding tax is to make ECB expensive and thereby discourage borrowers from this option. Presently the rationale for this levy appears to be rooted in macro-economic policy imperatives with a view to discourage capital inflows in the backdrop of surge in forex reserves and rising rupee.

9.17 Cargo Assurance through Long Term Charters

9.17.1 The Shipping industry has proposed to the government that long term charters by charterers for essential cargoes should be negotiated and concluded exclusively with Indian shipowners for Indian flag vessels which will ensure a dedicated fleet of vessels at competitive rates on a long term basis. The growth of Indian flag tonnage is of strategic importance to national security, energy security, food security, infrastructure security and offshore security. Therefore the country needs a strong and reliable merchant fleet which serves as the 'fourth arm of defence'. In order to grow, Indian Shipping Industry suggested following policy initiatives :-

(i) Develop a national fleet in the energy sector, similar in concept to the United States "Sea-lift Command". This national fleet should consist of Indian flag vessels to ensure uninterrupted transport of essential cargoes such as crude oil, petroleum products and gas and in the process ensuring national and energy security.

(ii) EXIM cargoes moved by the charterers must be transported on Indian flag vessels whenever Indian flag vessels are available. To encourage greater involvement of Indian vessels in EXIM trade a cargo reservation to be ensured for all energy cargoes. Transchart would evaluate the existing Indian fleet capacity and stipulate the percentage of cargo that would be reserved for carriage by Indian flag vessels.

(iii) Long term charters by the charteres for critical energy cargoes of crude oil, petroleum products and gas should be negotiated and concluded exclusively with Indian ship-owners for Indian flag vessels which will ensure a national fleet of vessels at competitive rates on a long term basis and will ultimately result in a win-win situation for the charterers, shipowners and the economy at large providing stability in freight costs and lowering input costs. Charterers can only enter into time charter with Indian flag vessels. In addition to time charters, charterers should also enter into contracts of Affreightment exclusively with Indian flag vessels.

(iv) The guidelines laid down in this regard should cover:-

(a) Policy is for EXIM cargo, i.e. both exports and imports.

(b) Long term charters of 5-7 years should be given to Indian flag companies.

(c) Commodities: crude and refined products, thermal coal, coking coal, fertilizer iron ore.

(d) Reservation of 33.33%.

(e) Applicable only to the charterers.

(f) Charterers to supply a monthly return to Director General Shipping (DGS), with a copy to INSA – showing quantum traded, YTD on Indian and foreign flag.

(g) If Charterers do not support this policy, they should not get any license to in charter a foreign flag for more than one year.

(h) In order to avoid any mishaps in implementation, the policy may choose to clarify that for Charters – at any given time Indian flag tonnage on long term should be 33.33%. This should be certified by a suitable competent authority at quarterly intervals. For non-Indian ships a charter option beyond 3 years cannot be exercised if Indian flag ships are available then.

(i) Non-compliance on the part of charterers will require charterers to buy all its imports solely on FOB basis in the next year.

(j) Further, non-compliance would entail restricted permission on in chartering of foreign flag vessels.

(k) The offer will be on the basis of a tender only for Indian companies.

(l) This will be applicable only for Indian flag companies and no other flag.

(m) ROFR on other charters such as spot to continue.

9.17.2 According to Indian PSU Oil companies, though the requirement of vessels for import of crude oil to India has increased manifold, the participation of Indian vessels in crude oil import has been dismal and the capacity of Indian fleet is limited to about 5% of the total tonnage requirement of IOC alone. Out of 296 VLCCs (Very Large Crude Carriers) fixed by IOC on spot market, only 4 were Indian ships constituting 1.3%. (VLCC import is essential to optimize the freight cost of IOC where the Indian VLCC tonnage is grossly inadequate). Even smaller sized Indian vessels are also inadequate to meet the complete requirement of long term contract. To meet their contract commitments Indian owners are becoming charterers' and taking other foreign flag vessels on time charter instead of increasing their own fleet size.

9.17.3 The oil companies further claim that the rates offered by the Indian vessels are far from competitive. Indian vessel offer high rates and are reluctant to take part in the negotiations because of certainty of getting business through ROFR. Reserving the long term business for Indian ships will make oil companies less competitive and in-turn make Indian owners as charterers in place of Oil companies. If the proposed reservation is only for the PSU oil companies and not applicable for the private sector oil companies, it is bound to make PSU oil companies less competitive in the market.

9.18 Proposed Projects for Shipping Sector

9.18.1 In order to promote growth of Indian shipping framing of appropriate policies, implementing them with a facilitative regulatory regime and appropriate monitoring at various stages are essential. To this end, following schemes are proposed.

9.18.1.1 Navigational Safety in Ports Committee (NSPC).It is proposed to set up an NSPC wing, which will carry out the oversight functions related to oil response, safety and navigational matters in the major and minor ports. The estimated cost for setting up the NSPC Wing and the recurring cost for the next 5 years would be approximately Rs 10 crore.

9.18.1.2 Ro-Ro Ferry Services: In order to develop coastal shipping, it is suggested to setup dedicated facilities for the Ro-Ro Ferry service network in Gulf of Kutch, Gulf of Cambay and western / southern coastal states of India. It is suggested that subsidy may be provided for construction of Ro-Ro jetties as an infrastructure with additional subsidy for a project involving construction of a pairs of jetties in order to facilitate movement of cargo between specified ports and also to cater to specific cargoes. The approximate cost for setting up jetties would be **Rs 100 crore**.

9.18.1.3 Pollution Response arrangements on Indian coast: It has been observed that the Oil Pollution Response arrangements set up in sea ports, oil terminals, and offshore structures with the coast guard is inadequate to deal with major oil spills There are 13 major ports and 62 operational non-major ports which are dealing with foreign trade. The estimated cost for the inventory, additional manpower / resources for undertaking the risk analysis, preparation of Regional mitigation plan, would be approximately Rs 100 crores.

9.18.1.4 Designation of Emission Control Area (ECA): In October 2008, International Maritime Organisation (IMO) agreed to amend MARPOL Annex VI adopting new tiers for control of NOx emission and sulphur contents in fuel. The proposal is for designation of an Emission Control Area (ECA) for specific portions of Indian coastal waters, for the control of nitrogen oxides (NOx), sulphur oxides (SOx), and particulate matter (PM) emissions. Adoption of the proposed ECA will result in significant reduction in ambient levels of air pollution along the coast of India. This will result in achieving substantial benefits to human health and the environment. The total cost of the project is estimated to be Rs. Rs100 crore.

9.18.1.5 Proposal for designation of Particularly Sensitive Sea Areas(PSSA): It is an area that needs special protection through action by International Maritime Organization

(IMO), because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. It is proposed to carry out study for designation of the Lakshadweep Island, Andaman and Nicobar Island and any other area which qualifies for PSSA. The estimated cost of the project is around Rs. 50 Crore to be completed in 3 years.

9.18.1.6 Strengthening of Port State Control and Flag State Inspections: At present inspections cover about 4% foreign ships calling at Indian Ports under PSC and 40% of Indian ships under FSI. The main constraint in the implementation is the availability of manpower. It is therefore proposed to recruit more surveyors for this propose so as to achieve 10% PSC inspections of foreign ships calling at our Indian Ports by 2015 as mandated by IOMOU. It is also proposed to carry out 100% FSI inspections of Indian ships by 2020.The expenditure for this project is estimated to be around Rs 100 Crore.

9.18.1.7 Legislative updation: The Merchant Shipping Act was enacted in 1958, and considerable changes have resulted in the maritime sector during the last 50 years due to technological advancements and growth in shipping . The provisions of the MS Act has not been amended for keeping it up-to-date, though minor amendments have been made from time to time to incorporate adoption of various international conventions adopted by India. A comprehensive revision of MS Act is necessary to make it in line with the current requirements of safety, security, seamen’s welfare and pollution prevention. Further, it is proposed that the period between the adoption of International convention and National legislation be reduced to 3 years by 2015 and to 1 year by 2020. The following conventions are proposed to be legislated between 2010 and 2020:Ballast water Convention Anti Fouling Convention Recycling Convention; OPRC-HNS Convention and Protocol; London Dumping Convention Wreck Removal Convention Bunker Convention; Maritime Labour Convention. In addition, the new conventions that are going to be adopted by IMO will also be taken up during the period. In the absence of regular legal professionals in the directorate, the legal expertise has to be hired, the expenditure for which upto 2020 is expected to be Rupees 12 Crore.

9.18.1.8 Voluntary IMO Member State Audit Scheme (VIMSAS): India has offered for

Voluntary IMO Member State Audit Scheme (VIMSAS) Once, the Audit Scheme is made mandatory, the Member States may be required to be audited once in five years. The Scheme will enhance the maritime administration's performance and also the port and Coastal State duties and responsibilities within the IMO instruments, which are of equal importance to those of flag States in ensuring that global maritime transport is safe, efficient and environmentally sound.

9.18.1.9 Marine disaster emergency response (Emergency towing vessel): This would require basic equipment for tow and de-canting of bunker oil from tanks of ships in distress; and a team of salvagers who will be available at short notice.

9.18.1.10 Ballast Water Management: While transporting cargo, ships transfer around 0.66 billion tones of ballast sea water from one port to another and from one part of the world to another. Ballast water contains various harmful micro organisms it not only deteriorates the ocean but also affects the territorial waters of other countries. The problem of bio invasion has therefore to be addressed at the earliest. The Marine Environment Protection Committee of the IMO has developed guidelines for the Ballast Water Management System. However, as per the convention, all ships constructed after 2010 onwards have to install ballast water system. The scheme involves two projects with financial implications: Project 1: Port biological baseline survey and risk assessment in 8 major ports in two phases at a estimated cost of Rs 15 Crore; Project 2 : Setting up of the facility of Ballast Water treatment Technology: verification and certification at an estimated cost of Rs 50 Crore.

9.18.1.11 Indian P & I Club: In present day scenario the maritime insurance of the ships, wreck removal, maritime causality, etc, both for the ship and seafarers, are catered by the P & I Clubs of foreign origin. Establishing the P& I Club in India not only brings increase in trade but also provides foreign exchange earnings when these clubs are used by foreign companies. An Indian P&I club can protect the interests of Indian ship owners especially when there is an international crisis, such as piracy, terrorist activity or a war, when the foreign clubs can arbitrarily increase the insurance premium.

9.19 Making the National Register Attractive to Augment Tonnage

9.19.1 Currently Indian Tonnage stands at 10.741 million GT and ranks 16th in the world shipping Tonnage. The Indian flagged vessels are carrying presently around 8% of Indian export – import cargo. Indian Shipping companies should aim to reach a level of 35 million GT by 2017 which will include owned and chartered tonnage. Out of this, 24 million GT may be the Indian owned tonnage. For achieving this tonnage an investment (including private investment) of around Rs.79,000 Crore is estimated. Out of this, SCI has presently identified projects worth Rs.27,668.40 Crore which will roughly take SCI owned tonnage to 7 million GT by 2020.

9.19.2 Acquisition Plans of the Shipping Corporation of India (SCI): SCI is the country's premier Shipping Line, presently owning a fleet of 74 vessels of 29.09 Lakh tonnes GT i.e. 51.13 Lakh tonnes DWT (as on01.10.2010), with a share of about 32% (in DWT) of the total Indian tonnage. Transportation of Crude oil and Petroleum products has been SCI's core business and this segment is expected to grow substantially considering India's energy requirements for the future. **Taking this into account, by the year 2020, SCI plans to acquire 25 crude oil tankers of about 2.50 million GT, which would comprise of VLCC, Suezmax tankers, Aframax tankers and 4 MR size product tankers of about 0.12 million GT.** Under the Bulk carrier segment, SCI plans to acquire 30 vessels of about 1.40 million GT by the year 2020, comprising of Capesize, Kamsarmax and Supramax vessels. SCI also proposes to acquire 4 Kamsarmax bulk carriers of 0.17 million GT through its Joint Venture company viz. SAIL SCI Pvt. Ltd. Accordingly, SCI plans to acquire 15 container vessels of about 0.72 million GT by the year 2020. SCI would be acquiring a mix of large and medium sized container vessels so as to effectively utilize them as per the sector specific requirements. In the offshore Services Sector, SCI has planned to acquire 23 offshore vessels of different capacities comprising of AHTSVs, PSVs, MSV and Rig. In the LPG and Chemical transportation segment, SCI plans to acquire 2 LPG carriers of 0.06 million GT and 4 Chemical tankers of 0.09 million GT. SCI also proposes to acquire 2 Chemical tankers of 0.04 million GT through its Joint Venture company viz. SCI Forbes Pvt. Ltd. Considering the opportunities available in the different shipping segments, the phasing out of SCI's older vessels and SCI's quest to become a global maritime player, SCI plans to acquire 110 vessels of about 5.21 million GT in the next ten years. This acquisition target includes SCI's 24 vessels on order (as of 01.01.2011) of about 0.74 million GT. Acquisition of the proposed vessels would lead to the SCI fleet touching level of 9.0 million GT by 2020.

9.19.3 Proposed projects during 2010-2020 by SCI

9.19.3.1 SCI proposes to acquire 110 vessels of different types and sizes based on the requirement of the trade. Out of the proposed 110 vessels of about 5.21 MGT, 24 vessels are presently on order (on going projects) amounting to 0.74 MGT which will be delivered to SCI by 2012. Balance 79 vessel acquisition projects will be processed by SCI and 7 vessel acquisition projects will be processed by SCI's Joint Venture companies in the dry bulk carrier, Chemical tanker and LNG segments. SCI would be reviewing its acquisition strategy and streamline the same on an ongoing basis to determine the size of the vessels.

9.19.3.2 Financing of projects: Vessel acquisition proposed by SCI would be financed through a mix of debt and equity, preferably in the ratio 80:20 (80% through commercial loan and 20% through Internal Resources). No Budgetary support will be required from Government for SCI's proposed projects. The total investment required for SCI's vessel acquisition Plan during the period 2010~2020 is estimated to be Rs. 27,668.40 crore. The breakup of investment is as follows: Ongoing Projects: Rs4765 Crore; **Phase I** Projects (2010-15):Rs 9632.40 Crore**; Phase II** Projects (2015-20): Rs13271 Crore.

9.20 Human Resource Development

9.20.1 Manpower in the Indian maritime sector could be vertically divided into two groups – (i) the seafaring personnel; and (ii) other personnel who are responsible for the movement of the ships and handling of cargo. Global demand for seafarers is expected to increase from 1.15 million currently to 1.6 million by 2020, driven by growth in cargo and a corresponding increase in fleet size. The current demand is 550,000 Officers and about 600,000 Ratings. By 2020, the global demand for each is expected to increase by 20 per cent: 660,000 Officers and 720,000 Ratings, an additional 110,000 Officers and 125,000 Ratings. In alternative GDP scenarios, growth in the number of seafarers could vary between 12 per cent and 26 per cent through 2020.

9.20.2 India can aspire to strong growth in Officers and Ratings by 2020.The share of high- quality Officers can increase from 6.3 in 2009 to 9.0 per cent in 2020, whereas share of Ratings could see a moderate growth from 7.5 per cent in 2009 to 9 per cent in 2020 by significantly improving their quality. This implies an additional 65,000 Officers and 45,000Ratings taking in to consideration annual attrition, which will require expanding annual training capacity from 5,600 to 15,000 Officers and from 4,600 Ratings to 9,000 Ratings.

9.20.3 Demand for Indian Ratings was estimated to be 45,000 in 2009, leading to an oversupply of 10,000 within the country. In addition, Indian Ratings are perceived to be of lower quality. Therefore, India can set itself an aspiration to grow moderately in the number of **Ratings and attain a market share of 9 per cent from the current 7.5 per cent.** This implies doubling capacity in the next 10 years and significant improvement in technical skills. India would have to supply an additional 45,000 Ratings, which may vary depending on the attrition rate. High crude activity is likely to drive manning demand for Ratings for Offshore Supply Vessels (OSV). In addition, developed economies having high Near Coastal Voyage (NCV) traffic should be targeted as these countries have a shortage of domestic seafarers.

9.20.4 Increasing the share of Indian officers in the world Shipping: The number of merchant navy officers globally is currently estimated to be 5,50,000, which will increase to 6,60,000 by 2015 assuming major supplying nations continue to train officers at historical rates. Shortage in officers is expected to become acute by 2013 as a result of higher growth in fleet size. **India is the 5th largest supplier of officers with a global share of 6.3%. India can aspire to substantially increase the number of its officers achieve a market share of 9%.** For this, India would have to supply 65,000 additional officers in the next 5 years, which would require that the training capacity almost triples in the next 5 yearsthe quality does not suffer. The expected cost of the project is Rs.20 Crore.

9.20.5 Dedicated training ships for giving on board training: Currently there are approximately 4000 training slots available for those coming out of various pre-sea training institutes in India. To achieve a market share of 9% in the next five years, the total training berths is estimated to be 16000. In order to create the additional training berths it is proposed to acquire dedicated training ships. Such a vessel, which can carry 400 trainees, is estimated to cost approximately Rs. 125 Crore. It is proposed to acquire 4 such ships by 2015. The approximate total cost of the project is estimated to be Rs.500 Crore.

9.20.6 Project for Welfare of Seafarers: It is proposed to restructure Seamen Provident Fund. Considering an average increase of 6000 seamen per year, the estimated financial outgo for this project would be approximately 400 crores for the period, 2010 to 2020.

The fund requirements for improving, strengthening and starting new initiatives in maritime transport covering training, welfare of seamen, restructuring of Director General Shipping, infrastructure for seamen welfare, proposed All India Maritime Service and development of information technology would entail a total cost of Rs 1425 Crore spread over three phases Rs252 Crore in 2010-12, Rs978 Crore in 2012-17 and Rs195 Crore in 2018-20, in consonance with international practices are detailed below.

9.21 Coastal Shipping

9.21.1 India has over 7500 km long coastline. Yet coastal shipping in the country is still in its infancy with the coastal fleet of about 700 ships accounting for just about a million GT or 10% of the total Indian tonnage whereas 337 ships engaged in overseas trade account for about 9 million GT. The average age of the coastal fleet is much higher compared to that of the overseas fleet. In terms of composition too (Table 9K), coastal shipping is dominated by Tugs followed by OSVs, port crafts etc; Coastal cargo accounts for about 133 million tons or one –fifth of 611 million tones of exim cargo in 2009-2010. Clearly there is a case for boosting the coastal trade in the country. Hence the need for a Coastal Shipping Policy.

Table 9K:Tonnage and Composition of Coastal Vessels (as end March 2011)				
Sr. No.	Type of Vessels	No. of Vessels	G.T.	D.W.T.
1	Dry Cargo Liner	72	125342	180636
2	Tug	246	74302	23424
3	Dry Cargo Bulk Carrier	14	240422	370028
4	Tankers (Product Carriers)	13	40035	43226
5	Tankers (Crude Oil Carriers)	2	50080	82246
6	Passenger-cum-Cargo	32	89435	27232
7	Passenger Service	54	16702	1964
8	Ethylene Gas Carriers	3	8727	6558
9	Ro-Ro	1	956	1386
10	Dredgers	28	121893	76152
11	Offshore Supply Vessels	114	124531	143686
12	Specialized Vessels for Offshore Services	48	88464	50480
13	Port Trusts & Maritime Boards	95	45377	15702
	Grand Total (Vessels) Coastal Trade	**722**	**1026266**	**1022720**

9.21.2 At a different level, the draft policy should also aim to boost i) the coastal cargo, ii) coastal trade, iii) various support services as well as iv) the carriers. While suggesting various measures for this purpose, specific attention is required to be paid to each of the four components of the coastal shipping i.e. IV (inland vessels), the RSV or the river-sea-vessels, the MS (Coastal-ships) as well as MS (Cross trade compatible). Policy measures have been formulated under nine broad heads

9.21.2.1 Promoting River Sea Vessels:

i) Consider extending the limit of 3000 GT / 3000KW further for RSVs, after examining the legal provisions in respect of NCV segment and after re- assessment of the safety requirements for such category of MS coastal vessels;

ii) Consider extending the scope of RSVs to other types of vessels such as oil tankers and other specialized vessels.

9.21.2.2 Infrastructure:

i) Set up more minor ports along the coast, at least one port at a distance of every100 kms

ii) Setting up dedicated berths for coastal ships;

iii) Promotion of Ro-Ro jetties;

iv) Promoting repairing jetties;

v) LNG supply facilities;

vi) Setup dedicated warehouses for coastal cargoes;

vii) Setup rail and road connectivity at the ports to the nearest rail heads;

viii) Set up adequate ship repair facility and dry-docks along the Indian coast for catering to the growth of coastal shipping;

ix) Deepening of sea channels at minor ports;

9.21.2.3 Financial incentives including subsidies:

i) Remove the lower limit of 80 M on ship – building subsidy in the new scheme proposed;

ii) Implement an aggressive ship-building subsidy policy with special focus on coastal vessels, tugs, OSVs, etc;

iii) Include subsidy for LNG use facility both on retrofitting basis for existing ships and for new ships;.

iv) SRU status to individual ships;

v) Subsidy for Ro-Ro jetties, repair jetties and a higher level of subsidy for a pair of jetties dedicated to coastal shipping;

vi) Tariff for coastal ships to be cheaper than those vessels which are on foreign run;

vii) Delink port tariff for coastal vessels from FG vessels and reduce it further by 30%;

viii) Waive service tax on costal/inland sea-freight as well as charter-hire of coastal/inland vessels;

ix) Establish a Coastal Development Fund for coastal ships. This fund may be used for an interest subsidy scheme for acquisition of coastal ships;.

x) All Indian ships should be granted the status of SRU thereby reducing the cost of maintenance for coastal vessels;

xi) Duty free bunkers to coastal vessels;

xii) Exemption of Customs Duty on import of certain categories of vessels (e.g. Tugs, Pusher Crafts, Dredgers and Floating Docks/Cranes/ Production Platformsetc);

xiii) Reduction/waiver of wharfage for coastal cargo;

xiv) Coastal vessels should be treated as movable infrastructure and therefore granted such status for the purpose of ensuring competitive funding and fiscal benefits;.

xv.) Introduce fiscal incentives for building & operating small ports (upto 5 m draft) Dedicated for coastal vessels;

xvi) Confer “Declared Goods” status to bunkers being consumed by coastal/inland vessels;

xvii) Introduce fiscal incentives, duty waivers and low-interest finance schemes for adopting “green technology – LNG powered vessels, etc;.

xviii) Exemption on tax for ship construction

9.21.2.4 Manpower issues including manning scales:

i) Upgrading of IV crew to RSV crew through bridge courses;

ii) Permitting CoC (FG) holders of MS vessels to jump one level up in manning RSVs;

iii) Permitting foreign CoC holders working on Indian coastal ships for a specified period before permitting them to appear for Indian CoC examinations’

iv) Establish a RSV cadre for officers-Master (RSV), Mate (RSV), 2^{nd} Mate (RSV), MEO CI III (RSV-Ch. Engg), MEO CI IV (RSV);

v) The courses & examinations for RSV cadre in order to source candidates from I.V. CoC holders;

vi)Candidates with certificates from ITI’s should be allowed to work on coastal vessels with certain bridge courses;

9.21.2.5 Cabotage Policy Support

i) Absolute cabotage for coastal trade other than transhipped EXIM containers, including empty containers;

ii) Right to issue NOC to foreign flag vessels on coastal run to INSA;

iii) Increase the Right-of-First-Refusal price band to 25% above the lowest foreign-bid (up from current 10%);

9.21.2.6 Declaration of IV limits for different states

i) Declaration of smooth and partially smooth water limits;

ii) All maritime states to notify model IV rules for construction and survey of IV vessels for operating in smooth and partially smooth waters;

9.21.2.7 Promoting modal shift from road and rail to coastal shipping

i) Improve competitive ability of coastal ships and facilitate shifting of cargo from road and rail to sea;

ii) A carbon credit scheme to be introduced with support from MoEF;

9.21.2.8 Data base and communication infrastructure

i) Establish & maintain a robust system/database for collection of accurate voyage specific data on coastal shipping;

ii) Data on the quantum of coastal cargo at various ports;.

9.21.3 Policies to Support Coastal Shipping:

9.21.3.1 Cabotage Law: In India, the Merchant Shipping Act bars foreign bottoms from carrying cargo between Indian ports; exceptions are made if no suitable Indian vessel is available. There is a view that in India cabotage restrictions discourage the growth of coastal shipping insofar as Indian tonnage is not adequate, and Indian industry is not aggressive enough, to increase the share of coastal shipping. It is also argued that international competition would bring about greater efficiency. A counter-argument is that relaxing cabotage laws will tilt the scales against Indian shipping. Ships with foreign flags are not bound by restrictive manning norms, including minimum remuneration, and usually operate under favorable foreign taxation rules and subsidies. However, if the primary objective is to increase coastal shipping and make coastal tonnage competitive it might be desirable to allow foreign vessels to compete for coastal cargo. Cabotage laws can any time be reintroduced when there is sustained growth in coastal cargo.There is also a view that cabotage on carriage of empty and / or transshipment containers should be partially relaxed with certain conditions. This partial relaxation may facilitate the efficient movement of containers as well as ease the congestion at ports and port storage. Presently empty / transshipment containers on the Indian coast are carried by Indian vessels only. If main line foreign shipping companies are allowed to carry their own empty and laden containers, these vessels will be able to use their empty slots more effectively and this will boost the container traffic on the Indian coast.

9.21.3.2 Ship Acquisition: One reason why coastal tonnage has been stagnant, , apart from the low profitability of coastal shipping, is the difficulty in getting finance at low interest rates. Although coastal ships are entitled to external commercial borrowing, they cannot effectively do so as they do not earn in foreign exchange. With the winding up of the Shipping Development Fund Committee and Shipping Credit and Investment Corporation of India Ltd, companies have to rely on traditional bank funding. These banks are not equipped to deal with the financing of ships; this also involves high interest rates and short maturity. There is, therefore, a case for developing specialized wings in development financial institutions to fund coastal shipping.

9.21.3.3 Import Duties: Coastal ships, unlike oceangoing vessels, have to pay duties on bunker oil. Bunker fuel oil and high flash high speed diesel for a coastal vessel is estimated to cost higher compared to an oceangoing vessel. Given the fact that coastal shipping is both fuel efficient and environmental friendly,there is a case for providing tax concessions both for fuels and spares.

9.21.3.4 Manning Scales & Cost of Vessels: There is a case for reviewing both manning scales and qualifications. A study by the Tata Energy Resources Institute (TERI) in 2003 indicated that because of manning scales, taxes, and other benefits, staff cost on Indian oceangoing vessels was higher than on foreign vessels. Wages still constitute a substantial portion of the cost of operation of vessels. Qualified officers prefer to work on oceangoing vessels. Considering that coastal vessels do not have to conform to the different conservancy and safety requirements in different foreign ports and face the hazards of the high seas, there is a strong case for revisiting the issue of safety. Coastal vessels are constructed to specifications of oceangoing vessels even though they are not subject to the same stress and turbulence. This needlessly increases their capital costs. There is a need to suitably amend the Merchant Shipping Act or enact separate legislation for coastal shipping to provide different specifications and lower manning scales.

9.21.3.5 Taxation: Tonnage Tax was introduced in the Budget for 2004-05. Shipping companies with oceangoing vessels have the option of choosing between corporate tax and tonnage tax, but not coastal shipping companies. Tonnage tax should also be extended to coastal fleet. **Personal Income Tax**: Indian seafarers employed on foreign vessels or Indian vessels which ply outside Indian territorial waters for more than 183 days in a year are entitled to non resident status and pay no taxes. This does not apply to officers and seafarers on coastal ships.

9.22 Addressing the issue of Manning

9.22.1 The industry's complaint about the need for a restricting of the regulatory regime stemmed mainly from the issue of manning. Indian ships have to mandatorily employ Indian seafarers, and do not have the dispensation to hire foreign seafarers. In view of the increasing worldwide shortage of ship's senior officers, there is inherent disadvantage to the Indian ship owners as employers. By virtue of extra burden of income tax on Indian seafarers' income, it makes the employment on a foreign flag the first choice of any Indian seafarer, and thereby denies the best talent to the local shipping industry. It will be necessary to take a positive approach on this issue and grant freedom to the Indian shipping industry by permitting them to employ foreign seafarers. It must be borne in mind that Indian seafarers on their part enjoy freedom to seek employment on foreign ships and not be bound by any duty to serve Indian ships. This position is neither comparable with domestic industry (such as aviation) nor the competing global industry in the backdrop of tight manpower supplies. Data shows that while other countries did have similar restrictions place, e.g. Norway, which is largely dependent on employment foreign seafarers in this sector, they have successfully allowed relaxation so that only a percentage of the manning complement is mandatorily domestic now.

9.23 Key Recommendations-Shipping

9.23.1 Cargo support on EXIM trade

9.23.1.1 The shipping industry has been reiterating that EXIM cargoes moved on account of the government should be transported on Indian flag vessels whenever Indian flag vessels are available through the policy of FOB purchase (import) and CIF sale (Export) and the right of first refusal (ROFR) to Indian flag vessels with a view to exercising shipping control over Indian cargo. Chartering wing of the shipping ministry (Transchart) needs to continue to make the shipping arrangements for all the government cargoes. Allowing oil companies the freedom to make their own shipping arrangements since 2005 has resulted in multiplicity of agencies handling government cargo and needs a review to bring all government cargoes under a single umbrella. This change of the policy has neither resulted in reducing the cost of shipping nor in any increase in Indian participation. The shipping industry has also urged the government to encourage greater involvement of Indian vessels in EXIM trade and a cargo reservation policy to ensure that all essential cargoes like crude oil, petroleum products, and gas are carried by Indian flagged vessels.

9.23.1.2 According to the Oil companies, which charter vessels for transport of crude oil to Indian ports, there have been considerable financial savings after the Government allowed PSU oil companies for direct chartering of ships in 2005, instead of going through Transchart. Hence the proposal by shipping industry association for the reversal of this policy to pre-2005 arrangement, i.e., chartering through Transchart, is a step backward and hence not acceptable to them.

9.23.1.3 After careful consideration of the views of Indian ship owners as well as Indian charterers, it is recommended that **1/3rd portion of the POL and dry bulk cargoes of EXIM trade of India, should be reserved for Indian Ships, and should be linked as condition for availing benefits under the export schemes of the Government of India. This will assure cargo availability for Indian ships, and act as a catalyst to boost the growth of Indian fleet.**

9.23.2 "Deemed Export Status" for Shipping

9.23.2.1 Indian shipping companies are exporting maritime transportation services to consumers out of India and are earning valuable foreign exchange as freight. It would therefore be just and sufficient to accord "**deemed export status**" to Indian shipping services and encourage the maritime transport service providers in building international competitiveness. Consequently, all inputs in terms of machinery, stores, spares and other related equipments used for the purposes of effectively operating an Indian flag vessel providing such an International maritime transportation service should qualify for a similar deemed export status and consequently be made free of local duties and taxes. It is therefore proposed that the DGFT policy circular be suitably modified to grant deemed export status to "maritime transportation services" provided by Indian shipping companies from India.

9.23.3 Service Tax

9.23.3.1 Exporters presently get refund of service tax paid by them on input services used for exports. Presently refund of service tax paid by exporters is given on on four taxable services (services offered to exporters by major ports, minor ports, road transport services provided by goods transport agency from inland container depot (ICD) to port of export and transport of export of goods in containers by rail from ICD to port of export) would now qualify for service tax refund. In many of the maritime countries the shipping industry is not subject to service tax either domestically or internationally. In the European Union, United Kingdom, Ireland, Singapore and Australia, the services availed of by shipping companies are either exempt from service tax or zero rated. **The ambit service tax exemption needs to be expanded to cover all marine services rendered in India and utilized by exporters. This would need list of such services on a verifiable basis to evaluate linkage of services with goods exported. Such shipping/marine services which facilitate exports and generate foreign exchange earnings could be exempted or zero rated. This will make such services price competitive.**

9.23.4 Seafarer's Taxation-Unequal treatment

9.23.4.1 Indian seafarers employed on foreign vessels or Indian vessels which ply outside Indian territorial waters for182 days or more in a year are entitled to non resident status and pay no taxes. This does not apply to officers and seafarers on coastal ships. Also Indian and foreign seafarers working in Indian territorial waters for 182 days or more are effectively Indian tax residents and are liable to pay tax on income. It may be noted that certain countries in Asia (Malaysia, Phillipines, Singapore, and Thailand) have exempted income of their seafarers from personal taxation. In some European countries, ship-owners are given the right to withhold a certain percentage of personal income tax and social security payment of seafarers as an incentive to hire European seafarers by offsetting part of the high wage level in their country. Labour is a factor of production and seafarers income could be subject to a lower fixed/ flat rate of tax which could be levied on all Indian seafarers irrespective of their residential status (i.e. place of work within or outside Indian territorial waters) and/or flag of ship they work for or; a higher exemption up to a certain level of income could be given for tax purposes. Such a tax will reduce the attraction of foreign flag and may also help coastal shipping which find it difficult to engage and retain Indian seafarers under the existing manning laws.

9.23.5 Rationalizing the Fiscal Regime

9.23.5.1 In terms of a strategy reformulation, a rationalization of the fiscal regime towards more openness and greater efficiencies in operation, is the most important and most urgent. Indian shipping, as against its foreign counterparts, is currently subjected to a variety of taxes numbering about 12 , some of them introduced in the year after relief was given through the tonnage tax, which affect the profitability of Shipping companies vis-a-vis fleets under foreign flags. Thus there is a strong case for rationalization of the taxation regime for the Indian shipping industry so as to bring down the effective tax rate to the rate payable by the industry when tonnage tax was fixed, at a level that will enable shipping companies to compete globally on a level playing field and also enable them to raise funds for acquisition of further tonnage.

9.23.5.2 Tonnage tax itself needs to be re-examined as to how it can be made attractive to new investors, so as to widen the base of the shipping industry in the country. At present, there are only 46 companies who have subscribed to the tonnage tax regime.. Changes in tonnage tax, e.g. to permit in-charters to avail of tonnage tax with only minimal limits should encourage companies to consider diversifying into this sector. In this regard, it may also be noted that the attempt to add to tonnage via a Bare Boat Charter-cum-Demise (BBCD) policy has not been very successful. Here again, a less guarded and more open approach to augmenting the ownership base of the tonnage under the national register is required.

9.24 Recommendations for Promoting Coastal Shipping

9.24.1 Infrastructure : (a) Set up minor ports along the coast, at least one port at a distance of every 100 kms; (b) set up dedicated berths for coastal ships; (c) promote RO-RO jetties and repairing jetties; (d) set up LNG supply facilities; (e) set up dedicated warehouses for coastal cargoes; (f) provide rail and road connectivity at the ports to the nearest rail heads; (g) set up adequate ship repair facility at dry docks and (h) deepening of sea channels at minor ports.

9.24.2 Subsidies: Implement an aggressive shipbuilding subsidy with focus on coastal vessels, tugs, OSVs etc. In addition, following measures may be undertaken : (a) remove the lower limit of 80 metre on ship building; (b) include subsidy for LNG use facility both on retrofitting basis for existing ships and new ships and (c) subsidy for RO-RO jetties, repair jetties and a higher level of subsidy for a pair of jetties dedicated to coastal shipping.

9.24.3 Indirect Tax Taxes/Exemption

9.24.3.1 As regards the Service tax issues, it may be stated that in the Union Finance Act, 2011, the Union Finance Minister had proposed an abatement of 25% from Service Tax for coastal transportation. However, availing this abatement would prevent service providers from claiming any input credit of taxes. Hence this abatement, from taxable value of freight should be increased from its present level of 25% to at-least 70% - 75%, which is at par with transportation of goods by roads and railways along with the waiver of restriction on availing of input credit. The CBEC has commented that it is a fundamental principle of the GST regime that a tax base should be wider, exemptions be minimal and tax rates easy to comply with.

9.24.3.2 One possible solution to reduce the net tax incidence burden on coastal shipping is to provide "Declared Goods" status for coastal bunkers. Section 2(c) of the Central Sales Tax [CST} Act defines 'Declared Goods' as those declared under section 14 of the CST Act as goods of special importance in inter-state trade or commerce. Declared goods are goods of special importance on which there are certain restrictions placed under the CST Act, 1956, on an imposition of Sales Tax or VAT by the states. Article 286(3)(a) of the Constitution of India authorises the Parliament (from the year 1982) to declare some goods as being of special importance and to impose restrictions & conditions in regard to the power of the states to levy, rates and other incidence of tax on such goods. Exercising this power, the Parliament, vide section 14 ibid has declared some goods as of special importance and has placed restrictions under section 15 supra on the imposition of Sales Tax or VAT on such goods by the State Govts.

9.24.3.3 Some goods like cereals, coal & coke, cotton, crude oil, sugar, textiles, jute, iron and steel, tobacco products, oil seeds, pulses & LPG etc. have been declared as goods of special importance. These are termed as 'declared goods'. Simply put, State Governments can not levy Sales Tax on these goods exceeding 4%. If declared goods are sold inter-state, tax paid within the state is reimbursed to the seller. Further, the said goods should be sold in inter-state transactions in the same form. Bunker fuel is used by Indian coastal vessels and their costs represent a large chunk of the overall operational costs. In view of the need to encourage the usage of environmentally mode of transport, providing a declared goods status to bunkers used by Indian flag ships will increase the competitive abilities and strengthen comparative advantages of coastal shipping.

9.24.3.4 Section 14 of the CST Act, 1956, gives the list of 'goods of special importance' called 'Declared Goods'. Item ii-d of the said list specifies that 'Aviation turbine fuel' is a 'declared good' under section 14 of the CST Act. Coastal bunkers used by Indian flag vessels should, similar to 'Aviation Turbine Fuel', be granted 'declared goods' status under section 14 ibid.

9.24.4 Fiscal Incentives: (a) coastal vessels should be treated as movable infrastructure and therefore, be accorded "infrastructure status" for the purpose of ensuring competitive funding; (b) introduce fiscal incentives for building and operating small ports (upto 5 metre draft) dedicated for coastal vessels.

9.22.5 Tariffs: ensure tariffs for coastal vessels are lower than for foreign going vessels. Further delink port tariff for coastal vessels from foreign going vessels.

9.24.6 Manpower and Manning Scales : (a) upgrade IV crew to RSV crew through bridge courses ;(b) permit foreign COC holders working on Indian Coastal Ships for a specified period before permitting them to appear for COC examination; (c) candidates with certificates from ITI's be allowed to work on coastal vessels with certain bridge courses.

9.24.7 Cabotage Policy: (a) The shipping industry has been urging the government on the need for absolute cabotage for coastal cargo as the Indian fleet is more than adequate to meet the coastal shipping demands in the areas of crude & petroleum products, gas transportation, offshore fleet in terms of PSVs and AHTSs, Construction Support vessels and container vessels. In such sectors the shipping industry has urged the government that absolute cabotage be implemented with appropriate amendments to the chartering guidelines in order to support the growth of the Indian national flag tonnage. Venkiteswaran committee on chartering guidelines and cabotage should be considered for implementation at the earliest.

(b) right to issue NOC to foreign flag vessels on coastal run to INSA; (c) enhance the Right of First Refusal Price band to 25% above the lowest foreign bid (up from 10%).

9.24.8 Carbon Credit Scheme: currently user industry gets the carbon credit to the exclusion of coastal vessels. There is need to put in place a mechanism to provide carbon credits to coastal shipping providers equivalent to carbon credits availed by the user.

9.24.9 Financing of Coastal Ship Acquisition: need to encourage/promote specialized window in financial institutional to fund acquisition of coastal vessels.

9.24.10 Separate legislation for Coastal vessels: Coastal vessels are constructed to specifications of oceangoing vessels even though they are not subject to the same stress and turbulence. This needlessly increases their capital costs. There is a need to suitably amend the Merchant Shipping Act or enact separate legislation for coastal shipping to provide different specifications and lower manning scales.

Chapter 10: Inland Water Transport

10.1 Background & Objective

10.1.1 In several developed countries Inland Water Transport (IWT) has long been recognized as a viable mode of transport with many advantages over other modes namely road and railways, especially for bulk goods, over dimensional cargo and hazardous goods. It is considered to be the most environment friendly mode with its excellent fuel efficiency and lower emission levels. IWT has also the potential to serve as an important economic lifeline for the integral socio- economic development of the region adjoining the waterway network. It provides high capacity transport corridors, largely untapped, at least in India. Under utilization of IWT mode is a great opportunity loss for the country.

10.1.2 Till the first half of 20^{th} century, IWT was an important mode and played significant role in trade and commerce along several rivers and canals. Growth of roads and railways coupled with total neglect of development of IWT infrastructure, however, made this mode virtually insignificant during the later years of 20^{th} century. Since Independence, until 1986 no organization at Central Govt level effectively addressed issues related to this sector despite several committees recommended proactive actions for development of this mode.

10.2 Current Status of IWT in India

10.2.1 National Waterways: IWAI was formed in October 1986 by an Act of Parliament with a mandate to develop and regulate inland waterways in the country for shipping and navigation and matters related to it. Three integral components of IWT infrastructure are (1) fairway and navigation infrastructure (2) Terminals and network connectivity to main land transport and (3) Barges/ vessels suitable to the fairway and cargo available. As of now there are five National Waterways (NW) namely the River Ganga (NW-1), River Brahmaputra (NW-2), West Coast Canal (NW-3), Kakinada to Puducherry Canal system along with River Godavari & River Krishna (NW-4); and the Brahmani and Mahanadi delta along with East Coast Canal (NW-5). River Barak is likely to be declared as the sixth NW. Development and regulation of NWs is in the purview of the Central Government while rest of the waterways come in the domain of the respective State Governments.

10.2.2 Table 10A gives waterways declared as National Waterways (NW)alongwith the length and year of declaration.

Table 10A: National waterways in India			
NW	**River/Canal Stretch**	**Length KM)**	**Declared (Year)**
1	River Ganga from Haldia to Allahabad	1620	1986
2	River Brahmputra from Dhubri to Sadiya	891	1988
3	West Coast Canal from Kottapuram to Kollam with Udyogmandal & Champakara Canals	205	1993
4	Kakinada-Puducherry stretch of Canals with River Godavari and River Krishna	1078	2008
5	East Coast Canal with River Brahmani and River Mahanadi delta	588	2008

10.2.3 Since their declaration, IWAI has been developing NW-1, 2 & 3 with navigation infrastructure (fairway, terminal and navigation aids). IWAI since its inception in October 1986, has spent about Rs 1036 Crore till 2010-11 which included about Rs 886 Crore on NW-1, 2 & 3 and the balance amount of Rs 150 Crore on CSS, Subsidy, training, Technical studies etc. The summary of investment by IWAI since its formation in 1986 is give below:-

- The average yearly expenditure of IWAI has gone up substantially from Rs 7 Crore/year in 8th Plan to Rs 108 Crore / year11th Plan.
- *But the total expenditure made on IWT infrastructure in 25 years (1986 to 20 11) is only Rs 1035* Crore *which is insignificant compared to road and rail sectors.*
- In respect of NW-4 and 5 (which were declared as NWs three years back) however, the Planning Commission could not allocate any funds due to which development works on these waterways could not commence.
- The public investment received by IWT has been of the order only Rs 0.23 Crore per km of National Waterways compared to Rs 2.1 Crore per km as aggregate investment earmarked for National Highways

10.2.4 Cargo Growth on National Waterways: Cargo transportation by IWT mode has steadily increased from 2005-06 to 2010-11. The cargo movement on National Waterways 1,2 & 3 has increased from 2.98 MMT(Million Metric Tonne) in 2005-06 to 4.92MMT in FY 2010-11 registering a over all growth of around 42%. In terms of billion tonne km (btkm) the cargo has been increased from 0.46 btkm in 2005-06 to 1.299 bktm in 2010-11.

10.2.5 Other Waterways: Besides National Waterways, several other waterways are extensively used for IWT; this prominently includes **Goa Waterways** for transportation of iron ore for export purpose and Mumbai Waterways for coal, steel etc. Goa Waterways comprise 50 KM stretch each of river Mandovi and Zuari and 20 Km stretch of Cambarjua canal. These waterways provide connectivity to Marmugao Port and Panaji Port and carry 50 MMT of iron ore for exports. The cargo movement on goa Waterways increased from 36.27 MMT in 2005-06 to 54.5MMT in FY 2010-11 registering a over all growth of around 50%. In terms of btkm cargo movement has increased from 1.761 btkm in 2005-06 to 2.725 btkm in 2010-11. **Mumbai Waterways** carried more than 10 MMT cargo per year mainly comprising coal and steel is transported on tidal inland waterways of Mumbai (River Amba, River Ulhas, Dharamtar creek etc). The cargo on Mumbai waterways showed increasing trend from 111.62 MMT in the FY 2005-06 to 1410.75 MMT in FY 2010-11, thus registering a strong grwoth of over 33% **.**In terms of btkm cargo movement has increased from 0.603 btkm in 2005-06 to 0.803 btkm in 2010-11.

10.3 Indo-Bangladesh Protocol on IWT

10.3.1 An Inland Water Transit and Trade Protocol exist between India and Bangladesh under which inland vessels of one country can transit through the specified routes of the other country. The existing protocol routes are: (i)Kolkata-Silghat -Kolkata ; (ii)Kolkata-Karimganj-Kolkata; (iii)Rajshahi-Dhulian-Rajshahi and;(iv) Silghat-Karimganj- Silghat. This protocol also allows trade between the two countries through IWT mode. For inter-country trade, five ports of call have been designated in each country. More than 1.5 MMT of fly ash is transported between Kolkata/Haldia and Bangladesh every year under this Protocol. Recently more than 90 consignments of project materials for Palatana power plant of ONGC, being constructed near Agartala in Tripura, have been transported from Kolkata/ Haldia through Protocol route up to Ashuganj in Bangladesh and thereafter by road to Palatana which is only 40 km from Ashuganj.

10.4 Potential of National Waterways and IWT

10.4.1 Cargo Potential on National Waterway1

10.4.1.1 The waterway is known to be most economical mode of transportation especially for bulk cargo like coal, iron ore, cement, food grains, fertilizer etc. Commodities wise transportation demand is discussed in the following section on various existing and proposed waterways.

i) Coal: A 1000 Mw thermal Plant needs 5MMTPA of coal and 100 Cusecs water. Due to their requirement of water they ought to be located along large water bodies. **A**s of now, ten thermal power stations are operational in proximity of NW-1 (as depicted in figure below). Further, eleven more Thermal Power Stations are expected to come up in Bihar and Uttar Pradesh in the next five-eight years with a total installed capacity of over 15000 MW.The total requirement of coal is estimated to be around 70 MMT per annum.Around 14 MMT of imported coal would need to be carried to these power stations from Haldia region. Hence all the existing and proposed thermal power plants along River Ganga are potential shippers for IWT if IWAI can provide assured channel of 2.5 m depth or more (a study to provide 3 m deep channel in Allahabad- Ghazipur stretch of River Ganga by river training/ barrage cum lock approach is already underway by IWAI) then upto 25 MMT per year of coal could be transported by IWT mode on NW1 in the years to come.

ii) Over Dimensional Cargo: As stated in the earlier section that 11 more power plants are scheduled to be commissioned during next 5-8 years. The total requirement of the ODC is expected to be around 2 MMT based on the planned capacity of 15000 MW.

iii) Fly Ash: With the average ash content of 25% in the coal, the total production of fly ash is estimated to be around 17.50 MMTPA (based on the total quantity of 70 MMT of coal). With the likely use of fly ash in the manufacturing of cement and in construction of road, waterway could be utilized for evacuation of fly ash from the power plants as these power plants are on the bank of NW1 and thereafter moved to the respective destination by utilizing multimodal transport system.

iv) Fertilizer: There is substantial potential to transport fertilizers from plants located near Allahabad (IFFCO Phulpur & Indo Gulf, Jagdishpur) and Haldia (Tata Chemicals Ltd, Haldia) to various locations in the State of UP, Bihar and West Bengal.The total consumption of fertilizer in India is estimated to be around 25 MMTPA. Of which around 10 MMTPA of Fertilizers are consumed in the State of UP, Bihar and West Bengal. A part of which could be moved by inland waterways.

vi) Foodgrain : The foodgrain surplus is mainly confined to the Northern States, transportation involves long distance throughout the country. There is huge requirement of foodgrains in the States of UP, Bihar, West Bengal and North Eastern States which are transported by road/rail as of now.

10.4.1.2 Cargo Projection There is huge potential for movement of goods on NW1; however as the IWT sector in India is still in early stage of its development and needs to gain the confidence of the user. It is proposed that the following quantities of cargo could be moved through NW-1 in case the requisite infrastructure would be provided in National Waterways (Table 10B).

Table 10B : Projected Cargo Potential on National Waterway 1

Commodity	**2019-20 (MMMT)**	**2019-20 (BTKM)**	**2020-30 (MMMT)**	**2020-30 (BTKM)**
Coal	10.00	10.00	20.00	16.00
Fertilizer	1.00	0.80	3.00	2.40
Fly Ash	2.50	2.00	5.00	4.00
Foodgrains	2.00	1.60	5.00	4.00
Other Commodities	0.49	0.39	1.50	1.20
ODC	2.00	1.60	5.00	4.00
Total Cargo	**17.99**	**14.39**	**39.50**	**31.60**

10.4.2 Cargo Potential on National Waterway-2

10.4.2.1 The main cargo identified to be moved on this waterway is coal, limestone, cement, fertilizers, iron & steel, building materials etc. It is proposed that the following quantities of cargo could be moved through NW-2 in case the requisite infrastructure would be provided in National Waterways (Table 10C)

Table 10C: Projected Cargo Potential on National Waterway 2

Commodity	**2019-20 (MMMT)**	**2019-20 (BTKM)**	**2020-30 (MMMT)**	**2020-30 (BTKM)**
Coal	2.60	1.30	5.00	2.50
Fertilizer	0.20	0.10	0.80	0.40
Foodgrains	1.00	0.50	3.00	1.50
Cement	2.00	1.00	4.00	2.00
ODC	1.80	0.90	3.60	1.80
Other Cargo	0.50	0.25	1.00	0.50
Total Cargo	**8.10**	**4.05**	**17.40**	**8.70**

10.4.3 Cargo Potential on National Waterway-3

10.4.3.1 The main cargo identified to be moved on this waterway is project cargo, food grains, bulk goods, fertilizers and POL. Besides container traffic which has commenced from February 2011 is of the order 200 containers per day by IWT is expected to pick up substantially (Table 10D).

Table 10D : Projected Cargo Potential on National Waterway 3

Commodity	2019-20 (MMMT)	2019-20 (BTKM)	2020-30 (MMMT)	2020-30 (BTKM)
Foodgrains	0.20	0.03	0.50	0.06
Project Cargo	0.03	0.00	0.05	0.01
Bulk goods	1.80	0.23	3.00	0.38
Fertilisers	1.90	0.24	2.50	0.31
POL	0.80	0.10	1.50	0.19
Total Cargo	**4.73**	**0.59**	**7.55**	**0.94**

10.4.4 Cargo Potential on National Waterway-4

10.4.4.1 The hinterland of NW4 could be divided into four cargo belts viz. Kakinada belt, Krishna belt, South AP belt and Chennai belt. Analysis of these cargo belts indicates that coal, cement, fertilizers and foodgrains account for majority of the total traffic in the hinterland. The main cargo identified to be moved on this waterway are coal, limestone, cement, fertilizers, iron & steel, building materials, paddy, tobacco, oil seeds, pulses, cotton, timber, bamboo, firewood, beedi leaves, chillies, general merchandise and civil supplies. The snapshot of total cargo potential by IWT for the proposed waterway is summarized over the forecast period (Table 10E).

Table 10E : Projected Cargo Potential on National Waterway 4

Commodity	2019-20 (MMMT)	2019-20 (BTKM)	2020-30 (MMMT)	2020-30 (BTKM)
Coal	2.27	1.14	4.22	2.11
Rice	0.90	0.45	2.01	1.01
Foodgrains	0.31	0.15	0.69	0.35
Cement	0.31	0.15	0.76	0.38
Fertilisers	0.41	0.20	0.77	0.39
Forest Products	0.19	0.09	0.41	0.21
Salt	0.14	0.07	0.29	0.14
Other general Cargo	0.32	0.16	0.66	0.33
Total Cargo	**4.85**	**2.42**	**9.82**	**4.91**

10.4.5 Cargo Potential on National Waterway-5

10.4.5.1 It is expected that the following quantities of cargo could be moved through NW-5 in case the requisite infrastructure would be provided in National Waterways. The proposed waterway passes through major towns like Talcher, Paradip, Dhamra in the river section and Bhadrak, Balasore, Jaleswar and Haldia in the canal section. The river section of waterway is basically rich minerals viz coal, iron ore and industrial products such as Ferro-chrome, steel alloys, tyres, granites and forest product. The canal section of waterway carries mainly agriculture production, handicrafts, textiles etc. The likely commodities to use the proposed IWT mode are divided into the following groups: **Minerals** : Coal, Iron Ore ;**Agricultural products**: Paddy, Rice, Straw, Animal fodder, Jute, Coconut and manure, consumables, fish products and; **Finished goods/Manufactured products**: Fertilizer, cement, sugar, salt, building materials (sand, bricks, metals, tiles, Asbestos sheets and fabricated steel items), textiles etc. The snapshot of total cargo potential by IWT for the proposed waterway is summarized over the forecast period in (Table 10F).

Table 10F : Projected Cargo Potential on National Waterway 5

Commodity	**2019-20 (MMMT)**	**2019-20 (BTKM)**	**2020-30 (MMMT)**	**2020-30 (BTKM)**
Coal	10.00	2.00	15.00	3.00
Finished Goods	0.13	0.03	1.83	0.37
Manufactured Goods	0.80	0.16	1.08	0.22
Agriculture Products	0.14	0.03	0.17	0.03
Total Cargo	**11.07**	**2.21**	**18.08**	**3.62**

10.4.6 Cargo Potential on National Waterway-6

10.4.6.1 In respect of proposed NW-6 on river Barak, the potential projected cargo is 1.053 MT (1.0 btkm) and the main commodities to be transported are: Rice, wheat, sugar, cement, edible oils, pulses, POL, military stores, coal, tea, food grains, bamboo, paper and paper products, timber an parcel goods.

10.4.7 Tourism

10.4.7.1 The usage of the IWT network for “water tourism” theme has potential to generate considerable income for the local economies and **additional income** from tourist/luxury taxes for regional and federal governments. Expanding the usage of the IWT for tourism can be efficiently included as one objective of broader plans to improve waterways for economic development. For example, in the **Philippines "Nautical Highway System"** was established to enhance investment opportunities for agro-industrial, commerce, trade and tourism, and also provide efficient and convenient travel movement of local and international tourists and investors through shorter travel time and cheaper transportation costs.

10.5 Projects in collaboration with Private Sector

10.5.1 Coal Movement for NTPC Power Plant at Farakka

10.5.1.1 NTPC's power plants at Farakka and Kahalgaon face acute shortage of coal mainly on account of limitation in transportation capacity of railways for both domestic and imported coal. These power plants are located on the bank of Ganga (the National Waterway-1). IWAI working with NTPC provided a solution for transportation of imported coal from Haldia/ Sagar/ Sandheads to these power plants by inland water transport (IWT) mode. NTPC provided long term commitment of transportation of 3 million tons per year (MMTPA) imported coal for their power plant at Farakka for seven years. Part of this coal can be transported from Farakka to Kahalgaon power plant through MGR railway line of NTPC between these power plants.

10.5.1.2 IWAI and NTPC along with IL&FS-IDC, developed a project envisaging an investment of about Rs 650 cr for setting up (a) transshipment facility at Sagar/ Sandheads, (b) barges for 3 MMTPA coal transportation (c) inland water terminal at Farakka; and (d) conveyor system from the terminal to the coal stack yard of Farakka power plant. The work for this project has been awarded to Jindal ITF Ltd whose quoted price for transportation of coal by IWT mode was about 15% less than what is currently being paid by NTPC. A Tripartite Agreement (TPA) was executed between NTPC, Jindal ITF and IWAI to carry out the development and operation of the project in August 2011. As per the agreement, Jindal ITF have been granted upto 24 months to undertake construction of entire facilities and thereafter operation and maintenance for seven years. IWAI has guaranteed Least Available Depth (LAD) of 2.5 m in the entire fairway up to Farakka for a period of 330 days along with provision of other navigational aids to ensure safe 24x7 river navigation. The coal supply under this project is expected to commence in 15 months from date of signing of TPA.

The Project will immensely help NTPC to overcome the acute shortage of coal due to inadequate capacity of its existing supply chain network. Since there are several existing thermal power plants along Ganga and many more are going to come up, success of this pioneering project may pave way for many more projects for transportation of coal on NW-1 and possibly on other National Waterways. This could also result in emergence of IWT as a supplementary mode for movement of bulk cargo for various Thermal Power Stations located on banks of River Ganga / Hooghly in West Bengal, Bihar and UP. Since IWT is an energy efficient mode of transportation, Power Plants could also earn 'carbon credits'.

10.5.1.3 This project shows that the private sector is indeed ready to make the requisite investment in construction and operation of IWT vessels and even to some extent in unloading infrastructure if adequate contract arrangements are made to mitigate demand and technology risks. If the consignees like Power Utilities, Food Corporation of India, Fertilizer Companies, Oil companies etc. are willing to give long term cargo commitment and IWAI is willing to guarantee safe navigation on the National Waterways with assured LAD, adequate private investment can be attracted in IWT sector to facilitate movement of several commodities. Keeping in view the strategic, environmental and economic benefits that can accrue to the country by developing IWT as a supplementary mode of transport for bulk cargo, this is an option worth promoting.

10.5.2 The other project being launched is Container Ro-Ro Services on NW 3.

10.5.2.1 IWAI and Cochin Port Trust have entered into an MOU for development of Ro-Ro/Lo-Lo IWT Terminals at Bolaghaty and Willington Island for providing connectivity to International Container Transhipment Terminal at Vallarpadam. Container traffic is expected to rise from 0.7MMTpa to 2.6 MMTPA in initial years of operation.

10.5.3 World over IWT is a preferred mode for transportation of **Over Dimensional Cargo (ODC).** With the proposed STPS coming up in UP,Bihar,West Bengal and NE States movement of ODC through Ganga and Brahmputra offers good opportunity. IWAI is charging user charge of Rs.1.50 per tonne km. of ODC transportation through NWs. IWAI has also entered into an MOU with NHPC, Jindal Power etc for usage of waterways for transportation of ODC over waterway. The Over Dimensional cargo moved on National Waterways for the past three years (2008-09 to 2010-11) has shown a six fold increase.

10.6 Policy Issues

10.6.1 Integration of waterways with other modes of transportation to form an efficient multimodal transport network is the key to achieve sustainable development of IWT sector. This requires detailed mapping of waterways and industrial clusters and analysis of origin and destination of cargo to undertake development of suitable waterways as well as multimodal transport hubs in IWT corridors.

10.6.2 Public investment in development of waterways shall serve as an important economic lifeline for development of North Eastern (NE) region which has abundant water resources ideal for IWT. The NE region does not have adequate road and rail connectivity but has an excellent river line network which can be developed as an integral mode of transport.

10.6.3 Policy support for creation of floating infrastructure i.e Barges/ Inland Vessels is critical to attract private capital for development of IWT sector. Being in its early stages of development in India, IWT sector bears significant technology and commercial risks. An institutional arrangement wherein the risk on investment is shared through a PPP mode could be more effective in making available the requisite infrastructure.

10.6.4 Extending mandatory intermodal share for cargo movements (currently mandated to all PSUs by PMO) to all public limited companies and creation of a suitable tradable instrument to help monetize the environmental advantages of the IWT sector on the lines of Renewable Energy Certificate (REC) can serve as a significant policy support. IWT sector has specificity in regard to type of cargo and regional configuration, therefore users' proximity to the waterways shall be critical in making the entire logistic chain cost competitive. Considering the significant environment advantages of IWT sector, its positive externalities need to be captured and monetized to effectively promote its use. A market based instrument similar to REC which will help monetize the positive externalities of IWT sector such as reduced carbon foot prints could be an effective policy incentive for the efficient development of this sector. Such a tradable instrument will help meet the modal share commitment as mandated by the Government while incentivizing the actual users of IWT for their contribution to the environment and society.

10.6.5 An institutional framework to appraise mission critical projects identified by IWAI will ensure timely and effective project development. Sub Group has conceptualized projects for creation of supporting infrastructure for movement of bulk cargo such as coal, fertilizer and food grains. Effective co-ordination across the respective functional ministries and PSUs shall ensure timely implementation of these projects. The project conceptualized by IWAI for movement of coal to NTPC Farakka Plant through NW-1 is a good example.

10.6.6 For effective resolution of policy and administrative issues, State Level Coordination Committees (SLCC) of various State Government agencies and IWAI under the State Chief Secretaries is critical imperative. Waterways other than NWs are being developed by the State Governments.. There is an urgent need for every reverine/coastal State to set up an IWT organization and to frame a long-term strategy for the IWT development.

10.6.7 Creation of adequate education and training facilities to help sector specific capacity building is necessary. IWT training facilities in the country are limited. National Inland Navigation Institute (NINI) was set up by the IWAI at Patna which started functioning from February 2004.The Working Group recommends NINI at the apex level and Regional Crew Training Centers (RCTCs) at State level.

10.6.8 For effective development of IWT sector in India all major waterways may be developed with 3 m depth and Government may take a policy initiative in this regard. IWT in all developed countries may vary greatly but they all have one common strategic fact that they have major IWT routes capable for efficient navigation of large IWT vessels.

10.7 Approach & Methodology for development of IWT sector in India

10.7.1 Analyzing, understanding and suitably adopting international experiences while formulating solutions are also important for their effectiveness. There are successful examples of IWT being systematically and sustainably developed internationally viz USA, EU, and China etc. There are lessons to be learnt from their experiences in creation of IWT infrastructure and vessels and in achieving an equitable modal share. Four countries in EU have more than7% cargo share by IWT. In Netherlands it is 42% and in China 8.7%. Our national average share of cargo will increase with formalization of IWT specific regions like in the Netherlands. It is in this context that fairway development and long term cargo assurance should get priority in IWT specific regions. In EU there is a **Marco Polo programme** which incentivize mode shift from road to environment friendly modes e.g. waterways/ shipping/ railways. Transport strategies in China, the USA and the EU all have the stated aim of increasing the role of IWT. **IWT has a great potential for development, this sector should be developed proactively**.

10.7.2 Efficiency and equity of resource allocation is critical to compliment the relative advantages of competing infrastructure sectors and thereby ensuring sustainability. Germany has 7700 km of waterways and 20% share of cargo by IWT. Their IWT budget for 2012 is 15 billion Euros, whereas India invested just over Rs 1000 Crore in last 25 years. The Sub Group has identified a number of projects whose financial implications have been worked out in detail. The aggregate amount of investment and its break up in terms of Budgetary support and private investment are given in **Table 10G.**

Table 10G: Investment Needs for IWT

Funding through	**2012-20**	**2021-30**	**Total (2012-30)**
Budgetary Support (BS)	17,430	12,530	29,960
Private Sector Participation (PSP)	15,940	17,860	33,800
Total	**33,370 (or say 33,500)**	**30,390 (or say 30,500)**	**63,660 (or say 64,000)**

10.8 Lessons from International Best Practices

10.8.1 World over bimodal and tri-model inland terminals have become an intrinsic part of the transport system. The tri-modal inland terminals have developed in European countries. Tri-modal terminals are so far not developed in our country and there is need to develop such infrastructure to meet the growing demand of efficient economical and sustainable logistics of the country.

10.8.2 The waterways in most of developed economics are extension and integration of rivers and canals thereby providing longer and deeper stretches of waterway. Most of the gateway ports are linked with all the three mode of transportation that provide an alternative mode of transportation for both inbound and out bound cargo.

10.8.3 China and the EU have both been successful in developing IWT container operations and China's container traffic between the coast and inland ports has nearly trebled in the last five years. **This is the case in India where IWT has a greater unrealized value or potential for development**. **In line with EU, USA and China standardization of waterway should be done in India to ensure depth and width which in turn enable in fixation of barge specification and configuration**. **Need for state funding of IWT infrastructure though other models like PPP, Viability gap funding etc. can be considered on the stretch which are viable from the point of private sector**.

10.8.4 Germany has 7700 km of waterways and 20% share of cargo by IWT. Its IWT budget for 2012 is 15 billion Euros. Four countries in EU have more than7% cargo share by IWT. In Netherlands it is 42%, and in China 8.7%. The national average will increase when IWT specific regions have a much larger share like in the Netherlands. **It is in this context that fairway development and long term cargo assurance should get priority in IWT specific regions e.g. the national waterways in consonance with the directive from the PMO.**

10.8.5 An efficiently run IWT system has environmental and social benefits over other modes of freight transport. It entails reduced congestion on roads, lower road accident costs, reduced the average energy consumption of freight transport, and lower the greenhouse gases (GHG).

10.8.6 Efforts should be made to develop tributaries of River Ganga & River Brahmaputra as feeder routes for inland waterway in line with waterways in European countries

10.9 Key Issues and Recommendations

10.9.1 The interaction with various stakeholders of IWT sector was of utmost importance to understand their concerns and to know their suggestions for growth of IWT sector in India. Dtailed interactive sessions were held with the stakeholders in Guwahati, Kochi and Kolkata in the months of January, February and March 2011 respectively These sessions were well attended by various stakeholders' including Shippers (CIL, NTPC, JCI, POL companies, Cement Companies) Operators, State Government agencies, Port Trust, Consultants, State IWT departments, Logistic operators, Ship Builders, FICCI etc. The key issues, challenges and suggestions emerged therein were carefully analyzed, and international experiences are suitably adapted while formulating recommendations for key issues. The key issues and recommendations thereon are outlined below:

10.9.2 Navigational Infrastructure :

a) Develop deeper stretches and maintain Least Available Depth (LAD) at 2.5 metres, preferably 3 metres for round the year navigation.

b) A special central fund may be made available for raising vertical clearance of at least 5 metre above HFL to facilitate passage of bigger IWT vessels.

c) Develop intermodal connectivity at IWT terminals through proper connectivity with road/rail.

d) Develop night navigation infrastructure in all National Waterways.

10.9.3 Inland Vessels

a) Revive Inland Vessel Subsidy Scheme.

b) Set up a Special Purpose Vehicle (Inland Vessel Leasing Company) that can procure and lease out the IWT vessel based on market demand.

c) Private sector participation should be explored for development of Maintenances Repair and Overhaul (MRO) facilities in North East States and other National Waterway Corridors.

d) Make IWT vessel building eligible for “Infrastructure Status” to avail easier credit availability

e) Make inland vessel building eligible for priority lending.

f) Bring inland vessels under Tonnage Tax.

10.9.4 River Basin Development

a) Each river basin should be developed with total integration of multiple users. To this end, a central legislation of “River Basin Authorities” under the control of Ministry of Water Resources will help total development of river basin.

10.9.5 River Training Work

10.9.5.1 Extensive river training works of spurs and dykes or barrages with navigation locks to be carried out in NW 1 & NW 2 for improving the navigation channel with depth 2.5 m to 3.0 m and width of about 50 metres for accommodating economic size vessels/tugs/barges.

10.9.6 Modal Integration

10.9.6.1 There is need to identify and develop the feeder routes on the water under jurisdiction of State, to National waterways so that the entire channel can be developed on the “fish bone structure” This would involve development of feeder routes in the North East such as Subansiri, Dhansiri, Dibang etc. as well as major tributaries of River Ganga such as Yamuna, Gandak, Kosi, Ghagra etc. Upon successful operations of these feeder routes will pave the way for the improvement of these routes by the development of barrages/weirs with navigational locks to ensure round the year operations of the routes

10.9.6.2 Similarly, integrate IWT and coastal shipping operations on stretches where feasible to promote seamless connectivity. One way could be combining inland terminals with automated RO-RO systems.

10.9.7 International Protocols

10.9.7.1 Simplify administrative processes and develop suitable operational support systems to reduce the average turnaround time of vessels plying on protocol route.

10.9.8 Access to tradable renewable energy certificate

10.9.8.1 Create a suitable instrument to help monetize the environmental advantages of the IWT sector on the lines of Renewable Energy Certificate.

10.9.9 Private Sector Participation in Waterways

10.9.9.1 Private sector participation into the development, maintenance and regulation of some stretches of rivers for inland water transport may be looked into.

10.9.9.2 Power utilities to bear cost of construction and O&M of material handling at power plant end as in the case with facility for unloading of railway wagon.

10.9.10 Training and Capacity Building

10.9.10.1 Need to revive and expand inland vessel crew training facilities in different States to meet requirement of manpower in IWT.

10.9.11 Long Term Cargo Commitment

10.9.11.1 Need for a longer term cargo commitment for economic/revenue sustainability. The shipper should provide guaranteed cargo for a specific period of time; focus on a few bulk commodities such as coal and iron ore besides over-dimensional cargo.

10.9.11.2 Fix 50% transportation of coal through IWT for new power projects, where origin-destination is on navigational waterways.

10.9.12 Policy Parity- Level Playing Field

10.9.12.1 Provide freight subsidy to IWT sector which is presently available for transportation of fertilizers by rail and road.

10.9.12.2 Provide transport subsidy for transportation by IWT mode in the North East. Abatement of Service Tax to the same extent as that provided to rail and road.

10.9.13 Legal and Administrative Issues

10.9.13.1 Need for uniformity in the realm of various operational/regulation aspects of IWT. This is necessary as navigable inland waterways run through more than one State.

10.9.13.2 Other matters pertaining to legal framework in IWT include : (a) Rewriting Inland Vessel Act; (b) Formulation of Model Rules under IV Act for adoption by States; (c) Regulations issued by IWAI to be adopted by the States for their waterways; (d) Notifications of Inland Water Limits; (e) MOU of IWAI with relevant Ports for promotion of IWT as a mode for evacuation of cargo; (f) Recognition of certificates issued by National Inland Navigation Institute (NINI) through appropriate regulation.

10.9.13.3 Need to address following risks which impact PPP projects in IWT: (a) IWAI only has "right to develop and regulate infrastructure for navigation" under IWAI Act; (b) Water is a State subject – State Government has the right to draw water as per its needs; (c) IWAI/Ministry of Shipping can't guarantee/compensate private developers if the State Government decides to draw water from the waterway and ; (d) Toll levied on use of fairway alone may not enable the private developer to recoup his investment.

10.10 Strategy for Development of IWT Sector

10.10.1 The table below summarises the targets for IWT sector, various recommendations for development of IWT sector and financial implications totaling around of Rs. 64,000 Crore proposed for investment in IWT by way of continuation, upgradation and launching of new projects during 2012 to 2030.

Table : Strategy for 2020 and 2030

#	Activity	Other Stakeholders	2012-20	2021-30	Financial Implication (in Rs. Cr)	
					2012-20	2021-30
1	**Target**					
1.1	Fix IWT target	Shippers & Transporters	25 btkm/ year by 2020	50 btkm/ year by 2030	-	-
2	**Policy issues**					
2.1	<u>Modal Shift incentives</u>					
2.1.1	Incentivize Modal Shift to IWT	MoEF				

2.1.2	Fix 50% transportation of coal through IWT for new power projects, where O-D is on navigable waterways	Ministries of Power and Coal; Planning Commission	-	-	-	-
2.2	**Level Playing Field**					
2.2.1	Transport subsidy at par with road & rail for fertilizer movement;	IWAI/ IWT Operators	Approval and continuation of the scheme	Continuation of scheme		
2.2.2	Transport subsidy for transportation to North East	Ministry of North East Region	Approval and continuation of the scheme	Continuation of scheme		
2.2.3	Power Utilities to bear cost of construction and O&M of material handling at power plant end as is the case with facility for unloading of railway wagons	Ministry of Power	To be approved and continued	Continuation of scheme	-	-
2.3	**Financial & Fiscal Incentives**					
2.3.1	Revival of Inland Vessel Building Subsidy Scheme	Planning Commission; Ministry of Finance	Approval and continuation of the scheme	Continuation of scheme	10000	16250
2.3.2	Abatement of Service Tax to the same extent as that provided to rail and road	CBEC	Approval and continuation of the scheme	Continuation of scheme		
2.4	**Long term IWT infrastructure Development Strategy**					
2.4.1	Up gradation of NWs by river training works for higher depth and width (say > 3m LAD) with other support infrastructure	Ministry of Shipping;	Policy Decision and implementation of projects in phased manner	Continuous process		
2.4.2	Development of Feeder IWT routes in 'fish bone model'	State Govts. Agencies	Implementation of projects	Implementation of projects	1500	3500

2.4.3	Integration with Coastal Sipping	Port Trusts, State Maritime Board, State Govts. Agencies	Implementation of projects	Implementation of projects	500	500
3	**Legal Framework**					
3.1	Rewriting of Inland Vessel Act	Ministry of Shipping	Notification of rules and regulation and implementation.	Implementation.		
3.2	Formulation of Model Rules under IV Act for adoption by States	Ministry of Shipping	Implementation of rules	Implementation of rules.		
3.3	Regulations issued by IWAI to be adopted by States for their waterways	IWAI	Implementation of regulations	Implementation of regulations.		
3.4	Recognition of certificate issued by NINI through appropriate regulation	Ministry of Shipping	Recognition of certificate issued by NINI			
3.5	Notification of Inland Water Limits	IWAI; DG, Shipping; Ministry of Shipping	Enforcement of rules by State Govts.	Enforcement of rules by State Govt.		
3.6	MoU of IWAI with relevant ports for promotion of IWT as a mode for evacuation of EXIM goods	Ministry of Shipping	Implementation	Implementation		
4	**Human Resource Development**					
4.1	Assistance to States for revival of Regional Crew Training Centers	MoS, Riverine states	Implementation	Implementation	50	-
4.2	Strengthening of NINI and its networking with RCTCs and IMU etc	MoS, DG Shipping	Implementation	Implementation	20	-
4.3	IWT training on STCW 2007 pattern	IMU, MoS	Implementation	Implementation	-	-

5	**Strengthening of Institutional Capacity**					
5.1	Restructuring of IWAI	MoS	Approval of proposal and implementation			
5.2	Strengthening of IWT units /departments in the States	MoS	Strengthening of State units			
6	**Projects**					
6.1	Operation & Maintenance of NW-1, NW-2 & NW 3	IWAI	Continuing project	Continuing project	500	500
6.2	Development of NW-4	Dept. Of Economic Affairs; CIL; Govt. of Orissa,	Development of entire NW4	Upgradation of water way	1800	1000
6.3	Development of NW5	Dept. Of Economic Affairs; CIL; Govt. of Orissa,	Development of entire section of waterway	Upgradation of water way	4500	800
6.4	Development of NW6	Ministry of Shipping	Declaration & Development of Barak river	Operation, maintenance and upgradation of water way	200	100
6.5	Development of Protocol route in Sunderbans	Ministry of Shipping	Development and upgradation of waterway	Upgradation of waterway	50	50
6.6	**River Training works, Stabilisation and rectification in NW 1 and 2: Commencement in 12 th Plan**					
6.6.1	Haldia – Farakka stretch of NW-1 & Dhubri – Pandu stretch of NW-2	Ministry of Shipping	Preparation of DPR and implementation	Maintenance and upgradation	300	100
6.6.2	Farakka – Patna stretch of NW-1 &Pandu – Neamati stretch of NW-2	Ministry of Shipping	Preparation of DPR and implementation	Maintenance and upgradation	300	100

6.6.3	Patna – Varanasi stretch of NW-1 & Neamati Dibrugarh stretch of NW-2	Ministry of Shipping	Preparation of DPR and implementation	Maintenance and upgradation	300	100
6.6.4	Varanasi – Allahabad stretch of NW-1 & Dibrugarh – Sadiya stretch of NW-2	Ministry of Shipping	Preparation of DPR and implementation	Maintenance and upgradation	2500	200
6.6.5	Development of IWT Terminals on National Waterways as multimodal (bi-modal & Tri-modal) terminals	Private Operators	Preparation of DPR and implementation	Upgradation and Operation of Terminals	2500	500
6.6.6	Barge Repair Facility in NER	Government of Assam & GRSE	Development & Operation of Repair facility on NW2	Operation of the facility	50	40
6.6.7	Extension of NW-3	Ministry of Shipping	Declaration as NW, land acquisition and development of waterway stretches		1000	100
6.6.10	Development of left bank DVC canal	Dept. Of Economic Affairs; Govt. of West Bengal; SAIL; DVC	Preparation of DPR & upgradation of water way	--------	200	50
6.6.11	River training and flow regulation structures and lean season flow augmentation with river linkages for improvement in LAD for round the year navigability.	Dept. Of Economic Affairs; MEA, State Governments; Min. of Water Resources; Power Utilities	Policy framework approval and Implementation of the projects	Implementation of projects	500	500

6.6.12	Development of Irrigation-cum-navigation canals like Sarda canal, Ganga canals, Yamuna Canal, Delta canal of Mahanadi, Godavari & Krishna	IWAI/Ministry of Shipping/ State Governments	Preparation of DPRs and implementation of projects	Implementation & operation of projects	500	500
6.6.13	Development of Goa Waterways	IWAI/Ministry	Upgradation of waterway	Upgradation of waterway	600	200
6.7	**Long Term Cargo Commitment based projects**					
6.7.1	Thermal Coal	Ministry of Power	12 btkm (in 2019-20)	23 btkm (in 2029-30)	1000	1000
6.7.2	Fertilizers	IFFCO, Phulpur; Tata Chemicals, Haldia	1.3 btkm (in 2019-20)	3.5 btkm (in 2029-30)	200	100
6.7.3	Food grains	State Govts.	2.3 btkm (in 2019-20)	5.9 btkm (in 2019-20)	300	200
6.7.4	Coking Coal	Ministry of Steel	1 btkm	2 btkm	200	200
6.7.5	Cement/Fly ash		3.2 btkm	6.5 btkm	50	50
6.7.6	POL products & Others cargo	Ministry of Petroleum	1.0 btkm	3 btkm	50	50
6.8	**Augmentation of vessel fleet**					
6.8.1	Setting up Inland Vessel Leasing Company	Financial Institutions	Approval of scheme and placement of orders for vessel construction in phased manner	Continuation of Leasing of vessels & maintenance of fleet	2000	2000
6.8.2	Setting up of JVs for vessel acquisition & operation	Ministry of Shipping, Private Operator	Approval of scheme and placement of order for vessel construction	Operation of vessels	1000	1000

7	**Scheme for Mechanized Country Boats**					
7.1	Commence scheme for technology upgradation of mechanized country boats for safety and operational capability.	IWAI; Ministry of Shipping	Approval of scheme & implemen tation	Implementa tion	100	100
8	**Promotion of River Tourism**					
8.1	Promote operation of River Cruises on Ganga, Brahmaputra and other Feeder routes	Ministry of Tourism	Setting of terminal for tourist	Setting of terminal for tourist	100	100
9	**International Cooperation**					
9.1	Timely completion of Kaladan Project	Ministry of External Affairs	Completi on by June, 2013	Operation of IWT services	-	-
9.2	Further improvement of Indo-Bangladesh Protocol Route; opening new routes & ports of call, joint river training projects to improve LAD, provision of Night navigation,, River information system etc..	Ministry of Shipping; Ministry of External Affairs	Financial assistance to govt. of Banglades h	Financial assistance to govt. of Bangladesh	500	500
TOTAL FINANCIAL IMPLICATION					**33370**	**30390**
		TOTAL			**63760**	
					say Rs. 64000 cr	

Annexure - I

No.-3/1/2010-Tpt.
GOVERNMENT OF INDIA
Planning Commission
National Transport Development Policy Committee (NTDPC)

Capital Court, Olof Palme Marg
Munirka, New Delhi-110067
Dated: 19th July, 2010

Subject: Working Group on Ports and Shipping for the National Transport Development Policy Committee (NTDPC).

It has been decided by the National Transport Development Policy Committee (NTDPC) to constitute a Working Group on Ports and Shipping Sector. The Composition and Terms of references of the Working Group are as under:

1. Composition

1	Secretary (Shipping) - Chairman
2	Shri Bharat Sheth, Member, NTDPC
3	Shri Gajendra Haldea, Member, NTDPC
4	Member Secretary/ Co-ordinator, NTDPC
5	Director General, Shipping
6	Director General, Foreign Trade (DGFT), M/o Commerce & Industry
7	Additional Member, Planning, Railway Board)
8	CMD, Shipping Corporation of India
9	Joint Secretary, Ports
10	CEO, Gujarat Maritime Board
11	MD, Container Corporation of India
12	Chief Engineer, Planning, Ministry of Road Transport & Highways
13	External Academic Expert
14	External Academic Expert
15	Shri Jimmy Sarbh, Sarbh Consultancy
16	Shri Krishna Kotak, Managing Director, J.M. Baxi & Company
17	Shri Thomas Netzer, Director, McKinsey & Company.
18	Representative of financial sector (nominated by Secretary, Department of Financial Services)
19	Representative of IT Sector
20	Adviser, (Transport Research) - Convenor

2. Terms of Reference

1. Review and determine the role of the maritime sector in meeting transport requirements of the economy over the next two decades, keeping in view the need to
   a. Conserve energy and protect the environment,
   b. Promote safety and sustain future quality of life,
   c. Create an optimal intermodal mix.

2. Estimate the potential growth in waterborne traffic by 2020 and 2030 in terms of both passengers and freight by
    a. Sea borne, Coastal and Inland Water.
    b. Major ports and non-major ports.

3. Consistent with the above, assess the current capacity and the required capacity in future, maritime infrastructure, including:
    a. Port infrastructure.
    b. Shipping.
    c. Creation of additional port infrastructure or the creation of ports at new, greenfield sites, and their role in promoting regional development.

4. In light of the above,
    a. Assess the investment required to achieve the projected maritime infrastructure capacity.
    b. Identify sources of funding and assess fund requirements from budgetary, non-budgetary and private sources for different areas in maritime infrastructure.
    c. Identify areas for PPP and the requirement of private and public funding in these areas.
    d. Examine the existing PPP policy framework and policy initiatives including regulatory and institutional framework and suggest changes necessary to attract greater private investment.

5. Examine the regulatory issues including the role of the Tariff Authority for Major Ports (TAMP) and suggest changes in policies concerning ports and shipping.

6. Review the relative role of major and non-major ports and suggest measures for integrated development of the ports sector, including a review of the current legislative provisions.

7. Estimate the energy requirements necessary for port infrastructure and shipping and suggest measures to put water transport sector on a sustainable low carbon path and promote energy efficiency, emission reduction and environment protection.

8. Review the status of rail-road connectivity of ports to the hinterland and make recommendations for development of multi-modal transport systems.

9. Assess the availability of human resources for the maritime sector and suggest measures for skill development and institutional capacity building for various stakeholders.

10. Suggest measures for promotion of research and development and technology upgradation in the water transport sector, including evaluation of technology trends in global shipping.

11. Indicate broad areas and investment for IT in water transport to improve customer interface/satisfaction and internal efficiency.

12. Identify data deficiencies in water transport and suggest measures for improving, maintaining and updating the database, including institutional measures.

13. Review the processes, productivity and efficiency of ports and shipping development and operations and make appropriate recommendations for their improvement.

3. Additional guidance for the Working Group

1. The Group may get special studies carried out by experts.

2. The Group may visit such places and consult such stakeholders, key users and experts as may be considered necessary for its work.

3. The Group may examine the laws, rules and regulations pertaining to maritime sector in connection with the TOR above and suggest legal, organizational, institutional and procedural reforms as necessary.

4. The Chairman may co-opt up to two additional members.

5. The expenditure on studies commissioned by the Working Group would be borne by the Ministry of Shipping.

6. The Working Group shall submit its report within nine months.

7. The non-official members of the Working Group will be paid TA/DA in accordance with the guidelines of NTDPC. The official Members will be paid TA/DA as per their entitlement by concerned Ministry/Departments where they are working.

(B.N. Puri)
Member Secretary (NTDPC)

Copy to

1. Chairman, NTDPC
2. All the Members of the Working Group

Annexure-II

OM No.22017/2/2010-TRW (Coord)
Government of India
Ministry of Road Transport & Highways
Ministry of Shipping
Transport Research Wing

Date: October 7, 2010

Subject: Constitution of the Sub Groups (SG) under Working Group (WG) on Ports & Shipping for the National Development Policy Committee (NTDPC)

It has been decided to constitute the following Sub Groups with the approval of the Chairman, WG on Ports & Shipping and Secretary (Shipping). The composition and issues to be addressed by these Sub Groups are as under.

Constitution of Sub-Groups for the WG on Ports & Shipping

It is suggested that following Sub-Groups may be formed to facilitate finalization of the Working Group Report on Ports & Shipping:

Sub Group-I

Sub Group on Cargo Traffic, Port Capacity, Investment requirements and review of processes and operation in the Port sector

Chairman: Shri Rakesh Srivastava, Joint Secretary (Ports), M/o. of Shipping, Transport Bhavan, New Delhi. Tel. 23711873; Fax. 23328549; Email: js-ports@nic.in
Members

1. **Shri Arvind Kumar,** Adviser (TR), Transport Research Wing, IDA Building (Room No.106), Jamnagar House, Shahjahan Road, New-Delhi. Tele:23381204:Fax:23383251; Mobile:9871248662; Email:adv-rth@nic.in
2. **Dr.ArchanaMathur,** Economic Adviser, Ministry of Petroleum and Natural Gas:Tele:24369261:Fax:24363047/24362589;Email:archana.mathur@nic.in
3. **Shri A. Janardhan Rao,** Managing Director, Indian Ports Association, First Floor, South Tower, NBCC Place, Bhismapitha Marg, Lodhi Road, New-Delhi. Tel. 24365632;Fax. 24365866; Mob. 9958675111: Email: md.ipa@nic.in
4. **M/O Power (Nomination to be intimated)**
5. **Shri R.Kishore, P**resident , Indian Private Ports & Terminal operators Association, CEO & Director, Vizag Seaport Pvt Ltd., Administrative Block, S-4 Gallery Port Area, Visakhapatnam-530035, Tele:0891-2556400;Fax:0891-2556400; M;09866398100;Email:rk@vizagseaport.com
6. **Capt.S.C.Mathur**, Chief Nautical Officer, Gujarat Maritime Board. Tel. No. 079-23234716; Mob.9898081610; Email: scmathur@airtel.blackbery.com
7. **Shri Jatin Sarkar,**General Manager (Economics & Transport),RITESTele:0124-2450510;M:9873405858;email:jatinsarkar@yahoo.com

8. **Shri M.M.Hasija, Adviser (Statistics)-Convenor,** M/o. Road Transport & Highways, Transport Research Wing, IDA Building, Jamnagar House, Shahjahan Road, New Delhi. Tel. 23389017; Mob. 9810932789; Email: mmhasija@yahoo.co.in

The Sub group would look into following aspects of major and non-major ports:1. Current and future Cargo traffic; 2. Capacity requirement; 3. Investment requirement; 4. Policy issues/regulations regarding the port sector

Sub Group-II

Sub Group on Rail Road Connectivity with Ports to look into current status of Port Connectivity, container/freight traffic flows and future connectivity requirements

Chairman: Additional Member (Planning), Rail Bhawan (Room No.202), New-Delhi.Tele:23382623; Fax:23303988

Members:

1. **Shri S.K. Puri,** Additional Director General (Roads), M/o. Road Transport & Highways, Transport Bhavan, New Delhi. Tel. 23739026; Mob. 9818222800; Email: adg2-rth@nic.in
2. **Shri Anil K. Gupta,** Managing Director, Container Corporation of India, CONCOR Bhavan, C-3, Mathura Road, Opposite Apollo Hospital, New Delhi-110076. Tel. 41673013; Fax. 41673019;Email: md@concorindia.com
3. **Shri A. Janardhan Rao,** Managing Director, Indian Ports Association, First Floor, South Tower, NBCC Place, Bhismapitha Marg, Lodhi Road, New-Delhi. Tel. 24365632;Fax. 24365866; Mob. 9958675111; Email: md.ipa@nic.in
4. **Shri B.Poiyaamozhi DA (Ports) –Convenor,** M/o. Shipping, Transport Bhavan, New Delhi. Tel. 23710456. Email: pirdsgn@nic.in

Sub Group-III

Sub Group on Data under Shri Arvind Kumar-, Adviser (TR), Transport Research Wing, IDA Building (Room No.106), Jamnagar House, Shahjahan Road, New-Delhi. Tele:23381204:Fax:23383251; Mobile:9871248662; Email:adv-rth@nic.in

Members:

1. **Shri A. Janardhan Rao,** Managing Director, Indian Ports Association, First Floor, South Tower, NBCC Place, Bhismapitha Marg, Lodhi Road, New-Delhi. Tel. 24365632;Fax. 24365866; Mob. 9958675111; Email: md.ipa@nic.in
2. **Shri Suresh Kumar Kantholy,** General Manager (ODC), Crimson Logic India Pvt.Ltd, 124 ,6th Floor, Surya Chambers, Murugeshpalya Airport Main Road, Begaluru-560017; Tele:080 4128 9999;Fax:080 2522 2889/4;M:9845999898; Email:suresh@crimsonlogic.co.it
3. **Shri M.M.Hasija, Adviser (Statistics)-Convenor,** M/o. Road Transport & Highways, Transport Research Wing, IDA Building, Jamnagar House, Shahjahan Road, New Delhi. Tel. 23389017; Mob. 9810932789; Email: mmhasija@yahoo.co.in
4. **Shri J.Murgadas, GM(ERP),** Shipping Corporation of India Ltd., Shipping House 245, Madame Came Road, Mumbai – 440021. Mob. 9869023980; Tel. 24937484/6179; Email: j.murugadas@sci.co.in

Sub Group-IV

Sub Group to look into R&D and Technology evolution in Shipping, energy requirements and initiatives to put the shipping sector on a sustainable low carbon path and promote energy efficiency, emission reduction and environment protection;

Chairman Prof.S.C.Mishra, Director, National Ship Design & Research Centre (NSDRC), Visakhapatnam Campus, Gandhigram,Visakhapatnam 530005; Tel:0891-2577744;Fax:0891-2577754;Mobile:09490417748
Email:misra.sc@nsdrc.res.in;misra_s_c@yahoo.com
Members:

1. **Shri Suresh Kumar,** Chief Ship Surveyor, DG, Shipping, Mumbai, Tel. 22656295/22613651/534; Email: suresh@dgshipping.com
2. **Shri G.V.S. Rao**, Executive Director, Shipping Corporation of India (SCI) Shipping House 245, Madame Came Road, Mumbai – 440021. Tel. 24950289; Email: gvs.rao@sci.co.in
3. **Shri D.J.Basu, Deputy Director, Development Adviser Ports Wing-Convenor,** M/o. Shipping, Transport Bhavan, New Delhi. Tel. 23357558;Email:ddmech@nic.in

Sub Group-V

Sub Group on IT to examine broad areas of IT investment and interface with users
Chairman: Shri Janardhan Rao, MD,IPA
Members:

1. **Shri J.Murgadas, GM(ERP),** Shipping Corporation of India Ltd., Shipping House 245, Madame Came Road, Mumbai – 440021. Mob. 9869023980; Tel. 24937484/6179; Email: j.murugadas@sci.co.in
2. **Shri Suresh Kumar Kantholy,** General Manager (ODC), Crimson Logic India Pvt.Ltd, 124 ,6th Floor, Surya Chambers, Murugeshpalya Airport Main Road, Begaluru-560017; Tele:080 4128 9999;Fax:080 2522 2889/4;M:9845999898; Email:suresh@crimsonlogic.co.it
3. **Shri Rajiev Puri, Deputy Director, IPA –Convenor,** First Floor, South Tower, NBCC Place, Bhismapitha Marg, Lodhi Road, New-Delhi. Tel. 24365041;M:9818555789;Email:rajivpuri@gmail.com

Sub Group-VI

Sub Group to look into existing framework of PPP, Private financing and bench marking of Indian Shipping and Port operations/practices and efficiency parameters
Chairman; **Shri Thomas Netzer, Director,** Mckinsey & Company Inc., Express Towers, 21st Floor, Nariman Point, Mumbai – 400021. Tel. 022-66302108;M:09833898856:Email:Thomas_netzer@mckinsey.com
Members:

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2) **Prof G. Raghuram,** Indian Institute of Management, Ahmedabad, Tel. 079-66324948;Fax. 079-66326896; Mob. 9825304948; Email: graghu@iimahd.ernet.in
3) **Shri A. Janardhan Rao,** Managing Director, Indian Ports Association, First Floor, South Tower, NBCC Place, Bhismapitha Marg, Lodhi Road, New-Delhi. Tel. 24365632;Fax. 24365866; Mob. 9958675111; Email: md.ipa@nic.in
4) **Smt. Geetu Joshi, Director,** M/o Shipping;Telefax:23321672;Email:dspd-ship@nic.in

5) **Shri C.S. Venkatraman, Secretary, TAMP-Convenor,** Tariff Authority For Major Ports, 4th Floor, Bhandar Bhavan, M.P. Road, Mumbai – 400010. Tel. 022-23792003; Mob. Email: tamp@tariffauthority.org

Sub Group-VII

Sub Group on Shipping to look into status of shipping and requirement, review of processes and operation in shipping, human resource requirement of the maritime sector and related policy issues and regulations

Chairman: Dr. S.B. Agnihotri, DG(Shipping), Directorate General of Shipping, Jahaz Bhavan, Walchand Hirachand Marg, Ballard Estate, Mumbai – 400001. Tel. 022-22673827 Fax. 022-22613655/22626756; Mob. 9403933383; Email: sbagnihotri@dgshipping.com

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9. **Shri C. Rathina Das,** Deputy Director General, DG Shipping, Directorate General of shipping, Jahaz Bhavan, Walchand Hirachand Marg, Ballard Estate, Mumbai –**Convenor**, Tel. 22612385; Email: rathinadhas@dgshipping.com

Sub Group-VIII

Sub Group on Inland Waterways to look into status, growth in cargo traffic and its composition, future scenario; infrastructure; technical and regulatory issues related to its operation and potential.

Chairperson: Smt Bhupendra Prasad, Chairperson, Inland Water Authority of India (IWAI), A-13, Sector -1,NOIDA, Uttar Pradesh, Tele:0120-2543972/2543973: Email: iwaich@rediffmail.com

Members:

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2. **Shri Jimmy Sarbh,** Sarbh Consultancy, Kamu Villa, 9 J.Mehta Road, Malabar Hill, Mumbai 400006; Tele:022 23611266;Fax:022 2361 1267; M:91 9867 333888; Email: sarbhmaritime@gmail.com
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4. **Shri Suresh Kumar,** Chief Ship Surveyor, DG, Shipping, Mumbai, Tel. 22656295/22613651/534; Email: suresh@dgshipping.com
5. **Shri G.S.Bhalla**,Sr Vice President, The Shipping Corporation of India Ltd. Shipping House 245, Madame Came Road, Mumbai – 400021. Tel: 22027346/22772411; Email: gsbhalla@sci.co.in

Appendix-I

Some Important Policy Issues & Recommendations

Mega Ports: Mega Ports find mention in the Interim Report. However, the time frame for planning/execution required to be curtailed from 20 years to a 12 years69999999999 time horizon, given the Exim requirements of the Indian economy in the coming years. In choosing location for mega ports, it is imperative to ensure rail-road connectivity and requirements of end users.

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On the issue of unified law for the Port Sector, there is need to use/modify the existing port legislations to suit present day requirements. While the focus of Major Ports Act, 1963 is primarily on the governance structure for Major Ports that of Indian Ports Act, 1908 is on host of other technical issues – conservancy, safety, navigation, technical, health, etc. In a federal set up to put in place a unified law may be a daunting task and this should later not inhibit the process of bringing about changes from time to time. Therefore a feasible option is to modernize the above general sections of Indian Ports Act, 1908 where it would be easier to achieve consensus and support from Maritime States. At the same time concerted efforts could be made to modernize the Major Ports Act 1963. This being a Central Act would be easier to amend and help bring convergence between these two Acts.

Efficiency Parameters: To tackle the high turn round time and pre-berthing detention one needed to take a holistic view of port operations: ship to shore and shore to hinterland. This needs identification of weak links in the chain. Presently only 33 berths at Major Ports are under Private/ (PPP) mode and the rest continue to be under the management of respective Major Ports. Therefore, a concerted effort is required to mechanize and modernize berth side operations, so as to concentrate on improvement of the efficiency parameters at ports.

Shipping: Domestic Shipping Lines have expressed strong need for cargo support for Indian Flagged Vessels to arrest the decline in share of Indian cargo being carried on Indian Flagged Vessels. While it may be not be easy to pursue "cargo support" for Indian Flagged Vessels there is need to focus on other fiscal incentives etc. for protecting the interests of the Domestic Shipping Industry. A desirable option to promote Indian Shipping is to put in place an incentive framework which : (a) promoted long term charter arrangements between India Flagged Vessels and domestic users (bulk commodities in particular) and; (b) promoting Indian owned but foreign flagged vessels in the first instance over the foreign owned foreign flagged vessels.

Coastal Shipping: In order to make coastal shipping a competitive and attractive alternative to road/rail, following initiatives could be pursued: (a) accord import duty exemption to bunker fuel; (b) 100% service tax abatement. Presently, transportation by coastal mode is subject to full service tax which makes it uncompetitive *viz-a-viz* other competing modes, such as Road (75% abatement) and Rail (70% abatement).

Tariff setting for Major Ports: Presently scale of rates for vessels/cargo handling for Major Ports (excluding corporatized Port of Ennore) is done by TAMP. Non Major/Minor Ports governed by States are outside the ambit of TAMP. This has led to a situation where Non Major Ports enjoy complete freedom/flexibility in tariff setting whereas Major Ports do not. Keeping these factors into account there is need to look into a dispensation where tariff is not set by TAMP but determined by competitive forces with TAMP overseeing from the point of view of maintaining competition and preventing monopoly/oligopoly situations.

Specialized Financing Agency for Maritime Sector: Keeping in view the massive funding requirement for the maritime sector there is a case for a specialized financing agency for maritime sector on the grounds: (i) Port projects involve huge sunk costs with long gestation period. Dwindling GBS for Major Ports and their weak balance sheets makes it difficult to access capital markets; (b) to get focused sectoral attention in accordance with the sectoral priorities; (c) maritime sector encompassed many other activities/businesses as well, such as, shipbuilding, ship repair, specialized equipment for loading/unloading etc. In case specialized financing institution for the maritime sector is not possible as it may face the risk on account of concentrated lending and exposure to a single sector, a specialized window within the existing financial institutions may be set up.

Model Concession Agreement (MCA): It has been observed that that MCA while reducing scope for constructive innovation in tendering process provided no flexibility and little scope for customization to suit the specific requirements of a port. The Land Lord Port Authority model may cut down time for investment approvals.

Coastal Vessels: Need for separate codes for coastal vessels which provide less rigorous construction specifications and manning scales viz-a-viz ocean going vessels. This would ultimately result in lower cost of operations for coastal fleet.

With the growing **emphasis on modal shift** towards eco friendly and efficient mode of transport there is a need to take a cue from Marco Polo Scheme in vogue in European Union to promote modal shift in favor of IWT/Coastal Shipping. Marco Polo Scheme offers subsidy to innovative schemes which promote coastal/IWT mode.

ADDENDUM

Projection of Cargo Traffic, Port Capacity, Investment requirements in the Port Sector

During 2011-12 Major and Non-major ports in India accomplished a total cargo throughput of 912 million tonnes reflecting a modest increase of 3.0% over 2011-12 compared to a growth of 4.2 % in 2010-11. The growth in cargo handled at Major and Non-major ports in 2011-12 was 1.7% and 11.5% respectively compared to 1.6% and 9.1% achieved in 2010-11. The deceleration in overall growth in India's seaborne cargo traffic in 2011-12 reflects slowdown in global and domestic growth during the course of 2011-12.

2. The year 2011-12 was a challenging year for the Major Port Sector as it was buffeted by three exogenous shocks (a) growth in major industrial countries which are a major market for Indian merchandise trade decelerated from 3.2% in 2010 to 1.6% in 2011 and is projected to grow at mere 1.4% for 2012. Similarly, growth in world merchandise trade decelerated sharply from 14.3% in 2010 to 6.3% in 2011; (b) India's GDP growth slowed down from 8.4% in 2010-11 to 6.5% in 2011-12. Slowdown and decline was pronounced in case of India's GDP pertaining to manufacturing and mining sectors: while growth in manufacturing slowed from 7.6% in 2010-11 to 2.5% in 2011-12, growth in mining sector made a complete about turn from 5% in 2010-11 to -0.9% in 2011-12; (c) series of judicial interventions leading to ban/restrictions on iron ore exports which resulted in more than 30% decline in its export. Iron ore loadings at major ports at 60.69 MT in 2011-12 were 27 MT lower compared with iron ore loadings 2010-11 leading to overall shortfall of 30.5 MT between the target and achievement for overall cargo traffic for 2011-12. These exogenous factors to a large extent reflect in sharp fall in iron ore loadings and deceleration in container traffic from 12.7% in 2010-11 to 5.4 % in 2011-12.

Cargo traffic at Major Ports in 2011-12

3. Cargo traffic at 560.1 million tonnes at India's 12 major ports during 2011-12 accounted for 61.4% of India's total sea borne cargo. Total cargo of 560.1 million tonnes comprises of cargo loaded, cargo unloaded and transhipped to the tune of 194.1 million tonnes, 341.6 million tonnes and 24.4 million tonnes respectively. The overall compound Annual rate of Growth (CAGR) of traffic at major ports during 1950-51 to 2011-12 has been 5.7 percent, whereas during the post- liberalisation period i.e. from 1991-92 to 2011-12, the CAGR was 6.7 percent. **The CAGR of traffic growth at major ports for the last 5 years was 3.8 percent.**

4. Commodity groupwise analysis of last 5 years of CAGR reveals that the **highest CAGR of 10.3% has been observed in container traffic, followed by 7.0% for Fertilizer and Fertilizer raw material** and 5.5% for the coal. As far as the cargo composition is concerned, there has been a significant change in the share of Iron Ore and container traffic during the past 5 years. The share of container traffic increased from 15.8% in 2006-07 to 21.5% in 2011-12 while the share of Iron Ore decreased from 17.4% in 2006-07 to 10.8% in 2011-12. During 2011-12, POL traffic maintained a dominant share of more than 32%, followed by Container traffic (21.5%), Other cargo (18.0%), Iron ore (10.8%), Coal (14.1%) and Fertilizer & FRM (3.6%).

Non – Major Ports – An Overview

5. Non-major ports in India collectively handled 351.51 million tonnes of traffic during the year 2011-12 as compared to 95.52 million tonnes of cargo handled in 2001-02. The CAGR growth in traffic during 2001-02 to 2011-12 achieved by Non-major ports was 13.9% compared with 6.9% achieved by Major ports in the country. The share of cargo traffic of Non-major ports in the total cargo traffic handled by all ports in India has increased steadily from 24.9% in 2001-02 to 38.6% in 2011-12. POL & its products (45.8%) was the single largest commodity handled at non major ports in 2011-12 and its share has ranged between 44% (in 2006-07) to 55 % (in 2001-02). It is observed that during last five years, the relative shares of commodities handled by the non major ports have not shown any pronounced shift. In 2011-12, the share of coal in the total traffic was 22.3% followed by Iron Ore (10.3%) and Building Material (3.2%).

6. The Table 1 gives commodity- wise CAGR of cargo traffic of Major Ports, Non-major ports and for all ports from 2001-02 to 2011-12 and 2006-07 to 2011-12.

Table 1 : CAGR Cargo Traffic						
Commodity	20001-02 to 2011-12			2006-07 to 2011-12		
	Major Port	Non-major Port	Total	Major Port	Non-major Port	Total
POL	5.7	7.8	6.4	4.7	6.4	5.4
Iron ore	19.2	14.9	17.6	-5.5	-2.0	-4.4
Coal	4.4	24.1	10.0	5.5	40.7	16.0
Fert & FRM	19.3	16.6	18.1	7.6	15.8	10.5
Containers	12.4	-	14.8	10.3	29.7	12.8
Other cargo	2.1	14.5	6.2	1.6	16.9	7.3
Total	**6.9**	**13.9**	**9.1**	**3.8**	**13.7**	**7.0**

Capacity at Major Ports

7. The total cargo handling capacity at the Major Ports exceeded the actual traffic handled for the first time in 2000-01 with little excess capacity in subsequent years.. The capacity in the Major ports as on 31.03.2012 was 696.53 million tonnes against the traffic of 560.1 million tonnes with a capacity utilization of 80.4%. The capacity at Non-major ports as on 31.03.2012 is estimated at 445 million tonnes against a traffic of 351.5 million tonnes reflecting capacity utilization of the order 79%.

Investment in major Ports

8. During the 11th Five Year Plan, an amount of Rs.5621.93 crore was allocated out of which Rs.3717.07 crore was utilized, thereby showing a utilization of 66.18%. The year-wise allocation and expenditure during XIth Plan is given in Table 2.

Table 2: Plan Outlay and Expenditure			
Year	**Plan Outlay (Rs. in crore)**	**Expenditure incurred (Rs. in crore)**	**Percentage of Plan utilization**
2007-08	**941.29**	**646.37**	**68.67**
2008-09	**1386.52**	**877.19**	**63.26**
2009-10	**1677.00**	**1050.00**	**62.61**
2010-11	**1617.12**	**1165.67**	**72.08**
2011-12	**1849.9**	**1180.21**	**63.82**
Total	**7471.02**	**4919.44**	**65.85**

Projection of Cargo Traffic, Capacity and Investment upto 2031-32

Cargo Traffic

9. Cargo traffic at Indian ports is affected in the short run by global economic and trade conditions and state of domestic economy. The sharp slowdown in the growth of world trade and in domestic growth in 2011-12 impacted Cargo traffic at Indian ports. As a consequence, the projections for Cargo traffic to be handled by Indian ports have been reworked. **The growth in cargo traffic handled by Major ports in the first quarter of 2012-13 was -5.5%.** Considering the weak global growth prospects and weakening of domestic growth dynamics, the cargo traffic at major ports is expected to grow at 3% in 2012-13 and thereafter at 6% for the remaining 4 years of the XIIth Plan. For Non-major ports the annual growth cargo traffic is assumed at 10%. Keeping in view the trends in the share of commodities in the Cargo traffic at Major ports and Non-major, the cargo traffic at Indian Major port and Non-major ports in maritime States is estimated to increase from 911.7 million tones in 2011-12 to 1315 million tones in 2016-17. Table 3 gives the Commodity-wise projected traffic of Major & Non-Major ports up to the end of XIIth Plan.

Table 3 : Projected Cargo Traffic at the end of XIIth Plan			
Commodity	2016-17		
	Major Port	Non-major Port	Total
POL	218.5	246.6	465.1
Iron ore	65.6	58.7	124.3
Coal	116.5	146.8	263.3
Fert & FRM	22.6	20.5	43.1
Containers	167.5	47.0	214.5
Other cargo	137.7	67.5	205.2
Total	**728.4**	**587.0**	**1315.4**

Cargo Traffic Projections during 2017-18 to 2031-32

10. The cargo handled at Indian ports mainly comprise of POL, Iron ore, coal and General cargo (in containers or break bulk). General cargo traffic handled at ports is affected by the changes in the global economy and domestic manufacturing activity. The Cargo traffic for subsequent year's upto 2031-32 has been projected using expected growth rate for various commodity groups based on perceptions of the user Industry and long term growth rate trends. Cargo traffic for the period 2017-18 to 2031-32 has been estimated using different growth rates across broad commodity groups; 4% for POL as long term availability of crude oil is likely to be tight resulting in high level of crude prices; Iron Ore export will need to be balanced keeping in view domestic consumption requirements of steel industry and environmental concerns, therefore,a modest growth of 2 % in cargo traffic of iron ore (mainly loadings) is expected; 5% for Fertiliser & FRM to meet domestic demand-supply mismatch, 8% for Coal to meet the requirement of Thermal generation and steel plants and; 7% each for Container and other Cargo due to increase in trade of manufactured goods.

11. The projected cargo traffic at the end of XIIth Plan (2016-17), XIIIth Plan (2021-22), XIVth Plan (2026-27) and in 2029-30 are given in Table 4.

Table 4: Commoditywise Cargo Traffic Projections (Major & Non-major Ports)							
							(Million tonnes)
Commodity Year	**POL**	**Iron ore**	**F&FRM**	**Coal**	**Containers**	**Other cargo**	**Total**
2016-17	465.1	124.3	263.3	43.126	214.5	205.1	1315.4
2021-22	565.8	137.2	386.9	50.0	315.2	287.8	1742.8
2026-27	688.4	151.5	568.4	58.0	463.1	403.6	2332.9
2031-32	837.6	167.2	835.2	67.2	680.4	566.1	3153.7

Capacity Required at Indian Ports during 2012-13 to 2031-32

Capacity Requirement at Indian Ports during 12th Plan (2012-13 to 2016-17)

12. The international practice for ports is to plan for cargo handling capacity of 30% more than the projected cargo traffic so that pre-berthing detention of ships on port account is minimised. The cargo handling capacity have to be planned separately for each commodity group as each of them require different configuration of facilities. The estimated capacity at the end of XIth Plan at all major ports and Non-major Ports is estimated at 696.5 million tones and 445 million tonnes respectively against traffic at 560.1 million tonnes at Major ports and 351.6 million tonnes at Non-major ports respectively. The traffic at Major and Non-major ports is expected at 728.4 million tones and 587 million tonnes by the end of the XIIth. Keeping in view the projected traffic at Major & Minor ports, the capacity required by Major and Non-major ports at the end of 12th Plan is estimated at 1710 million tones. Based on cargo traffic projections, commodity-wise total capacity requirement at the end of the year have been worked out from 2017-18 to 2031-32. Table-5 gives Commodity-wise capacity required at the end of XIIth Plan 2016-17), XIIIth Plan (2021-22), XIVth Plan (2026-27) and XVth Plan (2031-32) to handle projected traffic.

Table 5: Commoditywise Cargo Capacity Projections (Major & Non-major Ports)							
							(Million tonnes)
Commodity Year	**POL**	**Iron ore**	**F&FRM**	**Coal**	**Conta-iners**	**Other cargo**	**Total**
2016-17	604.6	161.5	342.3	56.1	278.8	266.7	1710.0
2021-22	735.6	178.3	502.9	65.0	409.7	374.1	2265.6
2026-27	894.9	196.9	739.0	75.3	602.0	524.7	3032.8
2031-32	1088.8	217.4	1085.8	87.3	884.5	735.9	4099.8

Investment Required during 2012-13 to 2029-30 in Port Sector

13. The investments required to create capacity for cargo handling in a port depends on several factors such as type of cargo, topography of port, channel depth and width, type of equipment etc. The cost of creating additional capacity depends on the commodity or group of commodities to be handled. Proper development of capacity at ports involve not only construction of berths/jetties for cargo handling but also other activities such as deepening of channels/berths, procurement of equipments and rail-road connections.

14. In order to create capacity necessary to handle projected traffic in XIIth Plan, a number of port development projects have been identified by Major Ports and Maritime States to be taken up by the terminal year of the 12th five year plan (2016-17). Most of the projects/ schemes conceptualized for capacity augmentation are through PPP mode. Based on the plans of Major ports and maritime States, the investment required and pattern of financing for capacity addition of 250.4 million tones at Major Port and 318.1 million tonnes at Non-major ports during XIIth Plan is given in Table-6.

Table 6: Investment by Major and Non-major Ports during XIIth Plan				
				(Rs Crore)
	GBS	**IEBR**	**Private Sector**	**TOTAL**
Major Port				
Construction of Berth/Jetties	166.0	4203.7	9448.3	13818.0
Dredging	3303.2	3791.8	0.0	7095.0
Port equipment & Machinery	0.0	1022.9	558.4	1581.3
Rail-Road Connectivity	0.0	3442.6	5531.1	8973.7
Total (Major Port)	**3469.2**	**12461.0**	**15537.8**	**31468.0**
Non-major Port				
Construction of Berth/Jetties	0.0	812.7	20024.8	20837.5
Dredging	45.0	369.1	3227.0	3641.1
Port equipment & Machinery	11.3	540.1	3306.1	3857.6
Rail-Road Connectivity	777.9	286.8	2963.6	4028.3
Total(Non-major Port)	**834.2**	**2008.8**	**29521.5**	**32364.5**
ALL ports				
Construction of Berth/Jetties	166.0	5016.4	29473.1	34655.5
Dredging	3348.2	4160.9	3227.0	10736.1
Port equipment & Machinery	11.3	1563.0	3864.6	5438.9
Rail-Road Connectivity	777.9	3729.4	8494.7	13002.0
Total (All Ports)	**4303.4**	**14469.8**	**45059.3**	**63832.5**

15. For estimates of investments required beyond 12th Plan, the methodology followed by the Working Group has been adopted. Investment requirement has been estimated at 2011-12 prices instead at 2010-11 pricesin the earlier

projections.. Plan-wise investment required for creative capacity during $XIII^{rd}$, XIV^{th} and XV^{th} Plan at Table-7.

Table 7 : Projected Investments (Rs Crore)

(Rs Crore)

Year	GBS	IEBR	Private Sector	TOTAL
2012-13 to 2016-17	4303	14470	45059	63833
2017-18 to 2021-22	4248	14284	44481	63013
2022-23 to 2026-27	5879	19767	61554	87200
2027-28 to 2031-32	8193	27547	85782	121522
Total	22623	76068	236877	335568

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Shipping: Domestic Shipping Lines have expressed strong need for cargo support for Indian Flagged Vessels to arrest the decline in share of Indian cargo being carried on Indian Flagged Vessels. While it may be not be easy to pursue “cargo support” for Indian Flagged Vessels there is need to focus on other fiscal incentives etc. for protecting the interests of the Domestic Shipping Industry. A desirable option to promote Indian Shipping is to put in place an incentive framework which : (a) promoted long term charter arrangements between India Flagged Vessels and domestic users (bulk commodities in particular) and; (b) promoting Indian owned but foreign flagged vessels in the first instance over the foreign owned foreign flagged vessels.

Coastal Shipping: In order to make coastal shipping a competitive and attractive alternative to road/rail, following initiatives could be pursued: (a) accord import duty exemption to bunker fuel; (b) 100% service tax abatement. Presently, transportation by coastal mode is subject to full service tax which makes it uncompetitive *viz-a-viz* other competing modes, such as Road (75% abatement) and Rail (70% abatement).

Tariff setting for Major Ports: Presently scale of rates for vessels/cargo handling for Major Ports (excluding corporatized Port of Ennore) is done by TAMP. Non Major/Minor Ports governed by States are outside the ambit of TAMP. This has led to a situation where Non Major Ports enjoy complete freedom/flexibility in tariff setting whereas Major Ports do not. Keeping these factors into account there is need to look into a dispensation where tariff is not set by TAMP but determined by competitive forces with TAMP overseeing from the point of view of maintaining competition and preventing monopoly/oligopoly situations.

Specialized Financing Agency for Maritime Sector: Keeping in view the massive funding requirement for the maritime sector there is a case for a specialized financing agency for maritime sector on the grounds: (i) Port projects involve huge sunk costs with long gestation period. Dwindling GBS for Major Ports and their weak balance sheets makes it difficult to access capital markets; (b) to get focused sectoral attention in accordance with the sectoral priorities; (c) maritime sector encompassed many other activities/businesses as well, such as, shipbuilding, ship repair, specialized equipment for loading/unloading etc. In case specialized financing institution for the maritime sector is not possible as it may face the risk on account of concentrated lending and exposure to a single sector, a specialized window within the existing financial institutions may be set up.

Model Concession Agreement (MCA): It has been observed that that MCA while reducing scope for constructive innovation in tendering process provided no flexibility and little scope for customization to suit the specific requirements of a port. The Land Lord Port Authority model may cut down time for investment approvals.

Coastal Vessels: Need for separate codes for coastal vessels which provide less rigorous construction specifications and manning scales viz-a-viz ocean going vessels. This would ultimately result in lower cost of operations for coastal fleet.

With the growing **emphasis on modal shift** towards eco friendly and efficient mode of transport there is a need to take a cue from Marco Polo Scheme in vogue in European Union to promote modal shift in favor of IWT/Coastal Shipping. Marco Polo Scheme offers subsidy to innovative schemes which promote coastal/IWT mode.

Policy Recommendations to promote Coastal Shipping

1. Promoting River Sea Vessels:

a. Facilitate smooth switch between IV (inland vessels) and RSV (river sea vessels) category on one hand and RSV and MS (larger merchant shipping vessels) category on the other, as per the need of the trade.
b. Create facility for e-notification of change of command, category of vessel and crew.
c. Consider extending the limit of 3000 GT / 3000 KW further for RSVs
d. Extend the scope of RSVs to other types of vessels such as oil tankers and other specialized vessels.

2. Infrastructure:

a. Set up dedicated berths for coastal ships (or exclusive coastal jetty)
b. Promote of Ro-Ro jetties
c. Set up adequate ship repair facility and dry-docks along the Indian coast to cater to coastal shipping
d. LNG supply facilities
e. Setup dedicated warehouses for coastal cargoes
f. Setup rail and road connectivity at the ports to the nearest rail heads
g. Deepening of sea channels at minor ports

3. Financial incentives including subsidies:

a. Accord ship repair unit status to individual ships
b. Delinking port tariff for coastal vessels from foreign going vessels and reduce it further by 30%
c. Waive service tax on costal/inland sea-freight as well as charter-hire of coastal/inland vessels
d. Duty free bunkers to coastal vessels

e. Confer "Declared Goods" status to bunkers being consumed by coastal/inland vessels
f. Establish a Coastal (Shipping) Development Fund for coastal ships. This fund may be used for an interest subsidy scheme for acquisition of coastal ship
g. Coastal vessels should be treated as movable infrastructure and therefore granted such status for the purpose of ensuring competitive funding and fiscal benefits
h. Exemption of Customs Duty on import of certain categories of vessels (e.g. Tugs, Pusher Crafts, Dredgers and Floating Docks/Cranes/ Production Platforms etc)

4. **Manpower issues including manning scales**:

a. Upgrading of IV crew to RSV crew through bridge courses
b. Permitting CoC (FG) holders of MS vessels to jump one level up in manning RSVs
c. Permitting foreign CoC holders working on Indian coastal ships for a specified period before permitting them to appear for Indian CoC examinations
d. Establish a RSV cadre for officers-Master (RSV), Mate (RSV), 2nd Mate (RSV), MEO CI III (RSV-Ch. Engg), MEO CI IV (RSV)
e. Allowing Candidates with certificates from ITI's should be allowed to work on coastal vessels with certain bridge courses

5. **Cabotage Policy Support**
a. Promote acquisition of vessels through the BBCD route

6. **Declaration of IV (inland vessel) limits for different states**

a. Integration of the IV waters with coastal shipping will require the declaration of smooth and partially smooth water limits and notification by all maritime states of model IV rules for construction and survey of IV vessels for operating in smooth and partially smooth waters

7. **Promoting modal shift from road and rail to coastal shipping**

   a. Improve competitive ability of coastal ships and facilitate shifting of cargo from road and rail to sea

   b. Carbon credit scheme: Not withstanding all its merits, the modal shift from road / rail to coastal shipping is not happening at the desired pace. It is necessary to incentivise this shift by bringing it under a carbon credit scheme;

8. **Data base and communication infrastructure**

   a. Establish & maintain a robust system/database for collection of accurate voyage specific data on coastal shipping
   b. INSA to publish annual report on coastal tonnage and coastal cargo and work towards a coastal index
   c. Develop a freight exchange for India-centric international container trade which may later be extended to coastal operations
   d. Streamlining the multi-modal transport operations