

**REPORT
OF
WORKING GROUP
FOR
PORT SECTOR
FOR THE
TWELFTH FIVE YEAR PLAN
(2012-2017)**

Government of India
MINISTRY OF SHIPPING

OCTOBER, 2011

12th Five Year Plan

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CHAPTER – 1

INTRODUCTION

1.1 The Planning Commission vide its O.M. No. 9/5/2011-Tpt dated 16th May 2011(second revised order) constituted a Working Group on Ports for the Twelfth Five Year Plan (2012-2017). The composition of the Working Group is as below:

1.	Secretary, Department of Shipping	Chairman
2.	Adviser (Transport), Planning Commission	Member
3.	Representative of Department of Commerce	Member
4.	Chairman-Cum-Managing Director, Dredging Corporation of India	Member
5.	Representative of the Department of Defence Production & supplier - Ministry of Defence	Member
6.	Representative, Department of Coal	Member
7.	Representative from Federation of Indian Chambers of Commerce and Industry (FICCI)	Member
8.	Chairman, Indian National Ship Owners' Association	Member
9.	Chairman, Indian Coastal Conference, Shipping House, 245, Madam Cama Road, Mumbai – 400 021	Member
10.	President, Indian Barge Owners' Association	Member
11.	Chairman, Gujarat Maritime Board	Member
12.	Chairman, Indian Ports Association	Member
13.	Chairman, Kolkata Port Trust	Member
14.	Chairman, Paradip Port Trust	Member
15.	Chairman, Vishakapatnam Port Trust	Member
16.	Chairman, Chennai Port Trust	Member
17.	Chairman, Ennore Port Trust	Member
18.	Chairman, Tuticorin Port Trust	Member
19.	Chairman, Cochin Port Trust	Member
20.	Chairman, New Mangalore Port Trust	Member
21.	Chairman, Mormugao Port Trust	Member
22.	Chairman, Jawaharlal Nehru Port Trust	Member
23.	Chairman, Mumbai Port Trust	Member
24.	Chairman, Kandla Port Trust	Member
25.	Chairman, Port Blair Port Trust	Member
26.	Chairman, Lakshadweep Port Trust	Member
27.	Chairman, Mundra Port Trust	Member
28.	Chairman, Pipavav Shipyard Ltd	Member
29.	Chairman, Cochin Shipyard Lrd	Member
30.	Prof. A S Ray, SIS/JNU	Member
31.	Managing Director, Indian Ports Association, IPA	Member
31.	Joint Secretary (Ports), Ministry of Shipping	Member Secretary

1.2 The Terms of Reference of Working Group is given under:

- (i) To review financial and physical performance of port sector during Eleventh Plan period
- (ii) To formulate strategy for the development of ports sector keeping in view the need for – (a) making Indian ports more competitive; and (b) meeting the emerging requirements of sea transportation of Indian trade.
- (iii) To project the traffic flows (commodity-wise) and assess the capacity requirements to meet the projected traffic demand during Twelfth Plan.
- (iv) To formulate programmes for the development of Ports sector during Twelfth Plan indicating – (a) physical targets and financial outlays; and (b) sources of funding
- (v) To develop a roadmap to ultimately corporatize the major ports through greater private sector involvement in port development and operations and greater role of PPP ports projects.
- (vi) To develop a comprehensive policy for promoting non-major ports and bringing the minor ports under one & the same laws relating to security as applicable to major ports.
- (vii) To formulate dredging plan along with sources of financing to accommodate larger ships in major ports.
- (viii) To formulate a comprehensive policy for uniform and systematic tariff fixation basis for the berths on all ports.

1.3 The Chairman of the Working Group may include any additional terms of reference in consultation with Member (BKC), Planning Commission.

1.4 The Chairman may constitute various specialists Group/Sub-Group/Task Forces as considered necessary and co-opt other members to the Working Group for specific inputs.

1.5 The expenditure towards TA/DA in connection with the meetings of the Working Group in respect of the official members will be borne by their respective Ministries/Departments. In case of Non-official members of the Working Group, expenditure towards their TA/DA would be met by the Planning Commission as admissible to the Class-I officers of the Government of India.

1.6 Department of Shipping has formulated Maritime Agenda: 2010-2020, which includes policy agenda and the projects to be implemented / under implementation in major ports end of XII plan and beyond. Working Group has taken into account the projects proposed in Maritime Agenda and also projections of traffic, capacity and investment made both in Maritime Agenda as well as by one of the sub-groups of working group on Ports & Shipping constituted by the NTDPCC while formulating its recommendations.

1.7 The first meeting of the Working Group was held on 15th June 2011 under the chairmanship of Secretary, Ministry of Shipping. In the meeting, following nine Sub Groups were constituted to consider and make recommendations relating to development of Ports in the Twelfth Plan period:

- (i) Cargo Traffic, Port Capacity and Investment requirement
- (ii) Port Efficiency and Modernization(including Port Community System- PCS), Human Resources Development, Corporate Social Responsibility and Social integration of Ports
- (iii) Port Connectivity and Logistics
- (iv) Private Sector Participation in Port Sector, Corporatization of Ports and Traffics
- (v) Capital dredging and Maintenance & Deepening of Channels, development of Ports and Harbours in Andaman & Nicobar Islands and Lakshadweep Islands
- (vi) Infrastructure to support Coastal Shipping Cruise Shipping and Development of Ship repair and Maintenance facilities

- (vii) Framework for co-operation between Indian Ports and Ports of other countries and Overseas investments
- (viii) Green ports, handling of dirty and dangerous cargo and port security and safety and modern communication (including VTS)
- (ix) PPP, security clearance and environment clearance

The composition and terms of reference of the various Sub-Groups are given in **Appendices 1.1 to 1.9**.

1.8 For the purposes of preparation of the Working Group's draft Report based on the reports submitted by sub-groups, the Ministry of Shipping constituted a Drafting Committee with the following composition:

1.	Shri A Janardhana Rao, Managing Director Indian Ports Association	Chairman
2	Shri Arvind Kumar, Adviser(TRW) or his representative	Member
3.	Shri C.Venkatachalam, Adviser, IMU	Member
4.	Shri C.S.Venkataraman, Secretary Tariff Authority of Major Ports	Member
5.	Shri T S Ashok Kumar, Deputy Traffic Manager, V.O. Chidambaranar Port Trust	Member Member
6.	Shri I.Ahmed, Sr Deputy Director (MS) Indian Ports Association	Member
7.	Shri M V. Kapardee, Dy. Director(R&P) Visakhapatnam Port Trust	Member
8.	Shri Rajeev Puri, Sr Deputy Director (IT) Indian Ports Association	Member

1.10. The Reports submitted by the various Sub-Groups contained their recommendations relating to Ports on traffic projections, capacities to be created at various ports, key performance parameters, HRD, PPP policy, environment, safety & security, Dredging and hinterland connectivity, etc . On the basis of the above recommendations and also the draft 12th Plan proposals submitted by the Major Ports and other organisations like ALHW, DCI, MPSO and R&D, & SCL, the report of the Working Group has been prepared .

Appendix 1.1

Sub – Group No. 1 on Cargo Traffic, Port Capacity and Investment requirement

Composition of Sub-Group		
1.	Chairman, Visakhapatnam Port Trust	Convenor
2.	Adviser (TR), Transport Research wing, Ministry of Shipping	Co- convenor
3.	Director (Engg.), Development Wing, Ministry of Shipping	Member
4.	Director(PO), Ministry of Shipping	Member
5.	Representative of Ministry of Commerce	Member
6.	Representative of CBEC	Member
7.	Representative of Department of Road Transport & Highways	Member
8.	Representative of Planning Commission (Transport Division)	Member
9.	Representative of Ministry of Railways	Member
10.	Representative of National Highways Authority of India	Member
11.	Representative of Ministry of Petroleum & Natural Gas	Member
12.	Representative of Ministry of Food Processing	Member
13.	Representative of Department of Fertilizer	Member
14.	Representative of Petroleum Planning & Analysis Cell (PP&AC)	Member
15.	Representative of Shipping Corporation of India	Member
16.	Representative of Govt. of Andhra Pradesh, Gujarat, Maharashtra, Orissa, Madhya Pradesh, Chattisgarh.	Member
17.	Chief General Manager (Logistics & Shipping), MMTC	Member
18.	Representative of Ministry of Steel	Member
19.	Representative of Ministry of Coal	Member
20.	Representative of Ministry of Mines	Member
21.	Representative of Ministry of Power	Member

22.	Representative of FICCI	Member
23.	Representative of Indian Private Ports and Terminals Operator Associations (IPPTA)	Member
24.	Representative of CSLA	Member
25.	Representative of MANSRA	Member
26.	Representative of INSA	Member
27.	Representative of IWAI	Member
28.	Representative of RINL	Member
29.	Representative of SAIL	Member
30.	Representative of NTPC	Member
31.	Representative of TNEB	Member
32.	Representative of CII	Member
33.	Sr Deputy Director (MS), Indian Ports Association	Member
34.	Representative of any of the port(s) <ul style="list-style-type: none"> • JNPT/ ChPT /CoPT /TPT/ Mundra Port for containerized cargo • KPT/MbPT/PPT for POL, Chemical, etc • KoPT/CHPT/PPT/MoPT for COAL, Fertilizers, etc 	Member

TERMS OF REFERENCE

1. To evaluate achievement during the 11th Plan vis-à-vis with projection made therein in terms of traffic and capacity of all commodities.
2. To project traffic, port-wise, for each year of 12th Plan and also give a perspective for five years beyond the 12th Plan period in respect of
 - Containerized Cargo.
 - POL, other Bulk Liquids, Chemical, etc (*while assessing the traffic, the impact of transportation of POL through pipelines should also be kept in view*)
 - Iron Ore, Fertilizer, Coal, Steel, etc (*while assessing the coal traffic the requirement of shore based ultra megapower plants may be kept in view*)
 - LNG
3. To formulate programme for development of Port facilities for handling the cargo during each year of the 12th Plan period separately indicating the physical targets and financial outlay requirements of replacements, modernization and augmentation of port capacity including sources of funding and taking into account (i) role of private sector and (ii) technological developments.

4. To examine and suggest measures for speedy and economic movement of containers to inland container depots.
5. With the increased degree of container traffic, to assess whether container handling facilities need to be developed at other ports and if so, the scale of facilities to be developed.
6. To assess further infrastructure required for speedy movement of containers like development of ICDs, CFS, inter modal transport system etc.,
7. To examine the areas providing facilities such as cold storage, warehousing for the exports of agriculture and horticulture products.
8. To examine why a high percentage of India's Container trade continues to be transshipped at Ports outside the country and to suggest methods by which the situation can be addressed.
9. To examine as to which ports should be developed with respect to their cargo.

The Sub-Group is free to consult agencies like CII & FIEO, or any other Association representing trade interests.

Appendix 1.2

Sub – Group No. 2 on Port Efficiency and Modernization (including Port Community System - PCS), Human Resources Development, Corporate Social Responsibility and Societal Integration of Ports.

Composition of Sub-Group		
1.	Managing Director, Indian Ports Association	Convenor
2	Dy Chairman, Jawaharlal Nehru Port Trust	Co-convenor
3.	Director(PO), Ministry of Shipping	Member
4.	Director(PHRD), Ministry of Shipping	Member
5.	Director(Engg), Development Wing, Ministry of Shipping	Member
6.	Representative of Planning Commission (Transport Division)	Member
7.	Representative of Ministry of Labour	Member
8.	Representative of Indian Maritime University	Member
9.	General Manager(F) & Secretary, EPL	Member
10.	Sr Deputy Director(IT), Indian Ports Association	Member
11.	Representative of any of the port(s) KoPT/ NMPT /VPT /MbPT	Member

TERMS OF REFERENCE

1. To evolve the broad strategies to make Indian Ports to achieve international standards in terms of productivity, efficiency and cost-effectiveness keeping in view the need for making Indian ports more competitive and meeting the emerging requirements of sea transportation of Indian trade.
2. To evolve realistic productivity norms both for man and machinery and to suggest measures to improve the labour and equipment productivity at the port and emerging use of computerization to reduce labour intensive mode of handling operations and to prune administrative overheads.
3. To assess the maintenance requirement of port infrastructure at different ports.
4. To evolve broad strategy for development of national skill set in the port sector by way of training, incentives schemes, restructuring of cadre, remuneration package, manning scales and performance appraisal.
5. To assess the surplus manpower at each ports and suggests measures for their re-training, re-development and retrenchment.
6. To identify the surplus equipment at the ports and suggest measures for their quick disposal.
7. To review the progress of Electronic Data Interchange/Port Community System at various Major Ports and suggest measures to remove bottlenecks, if any in its implementation.
8. To dwell upon and recommend the need for corporate social responsibility by the ports and way & means to accomplish the same. A broad policy of corporate social responsibility (CSR) for Major Ports may also be evolved.

The Sub-Group is free to consult agencies like CII & FICCI etc., either formally or informally.

Appendix 1.3

Sub – Group No. 3 on Port Connectivity and Logistics.

Composition of Sub-Group		
1.	Executive Director, NHAI	Convenor
2.	Executive Director(Traffic), Railways Board	Co-convenor
3.	Director(PO), Ministry of Shipping	Co-convenor
4.	Executive Director(PP&D), RVNL	Member
4.	Representative of Ministry of Finance (Deptt. of Exp.)	Member
5.	Representative of Planning Commission, Transport Division	Member
6	Representative of CONCOR	Member
7.	Representative of IWAI	Member
8.	Representative of IPPTA	Member
9.	Representative of INSA	Member
10	Sr. Deputy Director(MS), Indian Ports Association	Member
11.	Representative/s of any of the port(s) Ennore Port Ltd/ JNPT /CoPT /KPT	Member
12.	Representative of State Governments of Gujarat, Andhra Pradesh & Orissa.	Member

TERMS OF REFERENCE

1. To look into current status of port connectivity and container/freight traffic flow and examine the requirements of rail-road connectivity for each of the 12 Major Ports in the 12th Plan period and give a perspective for five years beyond 12th Plan.
2. To suggest measures for speedy implementation of the projects.
3. To suggest the most viable financial model for implementation of rail-road connectivity including source of funds for the projects.
4. To suggest measures for further improvement of rail-road connectivity to Ports.
5. To suggest measures for improving the facilities for multi-model traffic of cargo.

Appendix 1.4

Sub – Group No. 4 on Private Sector Participation in Port Sector, Corporatization of Ports and Tariffs

Composition of Sub-Group		
1.	Chairman, Jawaharlal Nehru Port Trust	Convenor
2.	Director (Finance), Department of Shipping	Member
3.	Deputy Secretary (PG), Department of Shipping	Member
4.	Director (PO), Department of Shipping	Member
5.	Representative of Planning Commission (Transport Division)	Member
6.	Representative of Department of Expenditure	Member
7.	Representative of TAMP	Member
8.	Representative of Ministry of Commerce	Member
9.	Representative of Ministry of Environment & Forests	Member
10.	Representative of Department of Ocean Development	Member
11.	Principal Director (Naval Intelligence)	Member
12.	Representative of Government of West Bengal	Member
13.	Representative of Government of Maharashtra	Member
14.	Representative of Government of Gujarat	Member
15.	Representative of Infrastructure Development Finance Corporation (IDFC)	Member
16.	Representative of Confederation of Indian Industries (CII)	Member
17.	Representative of any of the port(s) Ennore Port Ltd/ JNPT /ChPT /KoPT/TPT	Member

TERMS OF REFERENCE

1. To review the progress made towards private sector participation in the development of ports in the 11th Plan and suggest measures for making investment in port sector by private sector more attractive in the 12th Plan.

2. To review the progress made towards corporatisation of Major Ports and suggest remedial measures for speeding up the process of corporatisation at Major Ports.
3. To identify new areas of private investment in Ports.
4. To consider the guidelines and action plan to broaden the operational freedom to the Port authorities to invite private investment.
5. To consider measures for competition and transparency in port services.
6. To review existing tariff policy with special reference to phasing of cross subsidies and suggest ways for the adoption of more realistic tariff policy for the port sector. The role of Traffic Authority for Major Ports may be reviewed with a view to making suitable recommendations.
7. To examine the potential of the minor and intermediate ports to act as local/regional growth centers, to consider development of specialized minor ports as an integral part of the overall port system and suggest measures for the coordinated development of minor and major ports. To examine the need for regulatory authority for Ports in order to optimize investment being made in development of Ports whether major or minor.
8. To examine measures to upgrade the minor ports.
9. To assess the impact of development new ports on the nearby Ports so that the capacity available in the existing Ports is not under-utilized and formation of joint venture for synergy of operations.

The Sub-Group shall be free to consult private port developers, financial institutions engaged in infrastructure finance and Port users Associations at various Ports.

Appendix 1.5

Sub – Group No. 5 on Capital Dredging and Maintenance & Deepening of Channels , Development of Ports and Harbours in Andaman & Nicobar Islands and Lakshadweep Islands.

Composition of Sub-Group		
1.	Development Advisor (Ports), Ministry of Shipping	Convenor
2.	Chairman, V.O. Chidambaram Port Trust, Tuticorin	Member
3	C.O.M(OOT), KPT	Member
4.	Deputy Director (Civil), Ministry of Shipping	Member
5.	Representative of Dredging Corporation of India	Member
6.	Representative of Ministry of Environment & Forests	Member
7.	Representative of Ministry of Defence(Naval Headquarters.)	Member
8.	Chief Hydraulic Engineer, Kolkata Port Trust	Member
9.	Chief Engineer, Tuticorin Port Trust	Member
10.	Chief Engineer, Cochin Port Trust	Member
11.	Executive Engineer, ALHW	Member
12.	Representative of Government of Gujarat	Member
13.	Representative of Government of Tamil Nadu	Member
14.	Representative of Government of Maharashtra	Member

TERMS OF REFERENCE

1. To assess dredging requirements of Major and Minor Ports and prepare a road map/ Dredging plan for all Major Ports during 12th Plan.
2. To suggest measures to optimize the use of dredging fleet owned by Dredging Corporation of India (DCI) and port authorities.
3. To review physical performance of dredger fleet of the port and of the DCI with particular reference to the 11th Plan targets and lessons drawn therefrom for formulation of the 12th Plan.
4. To study the annual requirements of capital and maintenance dredging during the 12th Five year Plan and five years beyond the plan. The study should cover Major Intermediate and Minor Ports, naval and shipyard areas in the ports and fishing harbours.

5. To formulate programme for the development of dredging sector during each year of the 12th Plan indicating the physical targets and financial outlays, requirement for replacement, modernization and augmentation of dredging capacity. While formulating the Plan the following issues should be taken into account (a) role of the private sector in the dredging operations; (b) technological development; (c) comparative cost of dredging operations by DCI and Ports own dredgers and (d) standarization of crafts and dredging equipment (e) sources of funding for channel deepening in ports.
6. To study different practices in other countries for funding dredging contract for both capital and maintenance and suggest funding pattern in respect of Indian Ports.

The Sub-Group shall be free to consult private Dredging Companies formally or informally in case considered necessary.

Appendix 1.6

Sub – Group No. 6 on Infrastructure to support Coastal Shipping, Cruise Shipping and Development of Ship Repair and Maintenance facilities

Composition of Sub-Group		
1	Chairman, Cochin Port Trust	Convenor
2	Dy Chairman, Kandla Port Trust	Co-convenor
3	Director(PO), Ministry of Shipping	Member
4	Representative of JNPT, NMPT, MgPT, MbPT	Member
5	Representative of IWAI	Member
6	Representative of Ministry of Tourism	Member
7	Representative of Cochin Shipyard Ltd	Member
8	Representative of Indian Ship Builders Association	Member
9	Representative from Department of Defence Production and Planning Commission.	Member
10	Officer in-charge of SBR and coastal shipping in Ministry of Shipping	Member
11.	Representative of DG (Shipping)	Member
12.	Representative of INSA	Member

TERMS OF REFERENCE

1. To examine the existing status of coastal shipping and suggest the measures to increase the share of Coastal Shipping in the overall Port Traffic.
2. To recommend various Broad strategies to promote Cruise Shipping.
3. To examine the need for development of ship repair and maintenance facility in Indian ports and recommend various policy measures to increase the number of facility within the Coast
4. To suggest various physical & financial incentives for promotion of ship repair and maintenance facility at Indian Ports

Appendix 1.7

Sub – Group No. 7 on framework for co-operation between Indian Ports and Ports of other Countries & Overseas investments.

Composition of Sub-Group		
1	Managing Director, Indian Ports Association	Convenor
2	Representative of CHPT, VPT, MBPT, JNPT	Member
3	Representative of Ministry of External Affair	Member
4	Representative of Department of Economic Affair, Ministry of Finance	Member
5	Representative of Ministry of Commerce	Member
6	Sr. Deputy Director(IT), Indian Ports Association	Member
7.	Representative of IPPTA	Member

TERMS OF REFERENCE

1. To look into the areas of broad co-operation between Indian Ports and Ports of other countries
2. To identify the issues and matters, which inhibits international co-operation and suggests measures to remove those bottleneck.

3. To suggest Broad policy instrument by which bilateral and multilateral co-operation is sought to be achieved.
4. To develop models by which Indian Ports will have their presence and stacks in the Ports of other countries
5. To develop a broad framework to establish a special purpose vehicle (SPV) namely “Indian Ports Global” for overseas investment by Indian Ports
6. To explore the areas in which financial Aid/Assistance from international/multilateral organization can be sought

Appendix 1.8

Sub – Group No. 8 on Green Ports, handling of dirty and dangerous cargo and Port Security and Safety and Modern Communication (including VTS)

Composition of Sub-Group		
1.	Managing Director, Indian Port Association	Convenor
2.	Dy Chairman of VPT, CHPT, KPT	Member
3.	Deputy Conservator of KoPT, MBPT	Member
4.	Director (PO), Ministry of Shipping	Member
5.	Representative of National Disaster Management Authority (NDMA)	Member
6.	Representative of The Directorate General, Factory Advice Service and Labour Institutes (DG, FASLI), Mumbai	Member

TERMS OF REFERENCE

1. To examine the concept of green ports and suggest steps to be adopted by Indian Ports to transform into the Green Ports at par with international Ports.
2. To suggest various green practices to be adopted in the marine and port sector in collaboration with other sectors.

3. To suggest measure & approach for control of emission of CO₂ gasses and pollutants.
4. To identify the dirty, dusty and hazardous commodities being handled at Indian Ports and suggest measures to control the emission of dust & pollution.
5. To explore the possibility of moving dirty and dangerous cargo out of the city based ports within an identified time frame.
6. To assess the impact of handling of hazardous cargo on human habitation and port cities and suggest re-habitation strategies.
7. To recommend broad safety & security policy for the Indian Ports taking into consideration all the essential parameter including safety & security hazards.
8. To carry out the gap analysis in the channel of communication & navigation and recommend various essential safe guards to fill the gaps.

Appendix 1.9

Sub – Group No. 9 on PPP, Security Clearance and Environment Clearance

Composition of Sub-Group		
1	Chairman, Paradip Port Trust	Convenor
2	Dy Chairman of VPT	Member
3	Secretary, TAMP	Member
4	Director/ Dy. Secy. (PD), Ministry of Shipping	Member
5	Representative of Planning Commission	Member
6	Representative of Ministry of Environment	Member
7	Representative of Ministry of Home Affairs	Member
8	Representative of IDFC	Member

9	Representative of IL & FS	Member
10	Representative of IPPTA	Member
11.	Representative of Mormugao Port Trust	Member

TERMS OF REFERENCE

1. To examine the existing PPP framework in Indian Port sector and identify the possible bottlenecks which impede the private participation/ Investments in port sector.
2. To suggest measures for streamlining the procedures in obtaining early environment and security clearances.
3. To explore the different model for private participation in the port sector and recommend the same for promotion the private investment in port sector.
4. To suggest means/procedures for dealing with post-award developments.

CHAPTER - 2

REVIEW OF ELEVENTH FIVE YEAR PLAN AND MAJOR DEVELOPMENT INITIATIVES

2.1 Major Ports

2.1.1 Physical Infrastructure

The focus of activity in the Major Ports during the 11th Five Year Plan has been on additional capacity creation, modernization and provision of quality service at competitive rates. The aggregate capacity in the 12 Major Ports is expected to reach a level of 702.80 MTPA by the end of the 11th Plan period as against 504.75 MTPA at the end of the 10th Plan period, an addition of 198.05 MTPA. The targeted traffic for the Major Ports during 2011-12 is 600.60 MT. The Major Ports have continued to maintain a favourable capacity – traffic equation during the entire 11th Plan period. Major capacity addition projects completed during the 11th Plan period include SPM facility at Cochin Port for Kochi Refinery Ltd., Installation of SPM by IOC at Paradip Port, Construction of second container terminal at Chennai Port, Construction of second product jetty by ESSAR at Vadinar in Kandla Port, development of Coal and Iron Ore berths at Ennore Port, Commissioning of an International Container Transshipment Terminal at Cochin Port. The long awaited Sethusamudram Ship Channel Project, to provide a direct navigable sea route between India's east and west coasts within own territorial waters was sanctioned on 1st June 2005 and a total quantity of 28.42 Mm³ capital dredging was carried out. However the project is subjudice. A number of road and rail connectivity projects are under execution. Productivity parameters, both in terms of equipment and labour have shown an overall improvement during the Plan period.

2.1.2 Traffic

2.1.2.1 The working group report on 11th plan for port sector projected year-wise and port-wise traffic projections for the 12 major ports and year-wise traffic projections for the non-major ports. As per the report, the traffic projections made for the terminal year 2011-12 was 708.09 & 300.86 million Tonnes for major ports and non-major

ports respectively. The traffic projections made by the 11th plan working group report is compared with the actual traffic of major ports and Non-Major Ports.

2.1.2.2 Commodity-wise traffic handled by **Major Ports** during the first four years of 11th plan period and the estimated for the year 2011-12 are as below:

Year	Traffic handled (Million Tonnes)						
	POL & its Products	Iron Ore	Fertilizer and FRM	Coal	Container	Other Cargo	Total
2007-08	168.75	91.80	16.63	64.93	92.27	84.94	519.32
2008-09	176.14	94.04	18.23	70.40	93.14	78.59	530.54
2009-10	175.09	100.33	17.72	71.71	101.24	95.00	561.09
2010-11	179.17	87.06	19.99	72.73	114.11	96.97	570.03
2011-12 (Estimated)	182.28	86.83	20.60	86.06	122.77	102.06	600.60

2.1.2.3 Commodity-wise traffic handled by **Non-Major Ports** during the first four years of 11th plan period and the estimated for the year 2011-12 are as below:

Year	Traffic handled (Million Tonnes)						
	POL & its products	Iron Ore	Fertilizer and FRM	Coal	Container	Other cargo	Total
2007-08	91.04	34.22	7.11	15.44	11.05	47.52	206.38
2008-09	97.82	35.86	8.86	21.46	11.97	37.25	213.22
2009-10	145.15	49.06	6.33	41.37	14.85	32.56	289.32
2010-11	153.48	42.50	10.98	58.52	17.56	31.60	314.64
2011-12 (Estimated)	188.00	51.00	11.00	77.00	19.00	24.00	370.00

2.1.2.4 Comparison of actual traffic with the traffic projections given for the first year and the terminal year of 11th plan in the working group report is as follows:

(In Million Tonnes)

Commodity	2007-08		2011-12	
	Projected	Actual	Projected	Estimated
POL	247.65	259.79	378.45	370.28
Iron ore	114.30	126.02	128.04	137.83
Coal	93.99	80.37	138.94	163.06
Other cargo	123.00	156.20	193.59	157.66
Containers	86.54	103.32	169.93	141.77
Total	665.48	725.70	1008.95	970.60

2.1.2.5 The anticipated combined traffic of Major and Non-Major ports in the terminal year of 11th plan is likely to be around 970.60 Million Tonnes as against the 11th plan terminal projection of 1008.95 Million Tonnes, thus showing a short –fall in traffic of about 38.35 Million Tonnes. The short-fall is primarily attributable to slow pace of recovery of economy, decline in Iron Ore exports due to restrictions imposed, change in policy to encourage domestic steel industry.

2.1.3 Port Capacity:

2.1.3.1 The actual capacity of major ports at the terminal year of 10th five year plan i.e. as on 31.3.2007 was 504.75 Million Tonnes as against the projection of 508.60 Million Tonnes. The break up of capacity of major ports as on 31.3.2007 is at **Annexure-2.1**. The capacity of major ports is expected to go up to 702.80 Million Tonnes as on 31.3.2012 through implementation of:

- | | |
|---|----------------------|
| i) Spill over schemes of 10 th plan/
New schemes of 11 th Plan | 81.00 Million Tonnes |
| ii) Improvement in Productivity | 84.38 Million Tonnes |
| iii) Capacity addition during end of terminal year | 32.67 Million Tonnes |

2.1.3.2 As against the above the capacity addition due to implementation of Spill over schemes of 10th plan/new schemes of 11th plan and through improvement in Productivity, the increase in capacity for the first four years of 11th Plan period is

165.38 Million Tonnes. The details of schemes are at **Annexure-2.2**. The present capacity of major ports as on 31.3.2011 is 670.13 Million Tonnes and the details are given at **Annexure-2.3**.

2.1.3.3 The details of projects which are likely to be completed before 31.3.2012 are given at **Annexure-2.4**. The total capacity of the Major ports at the end of 11th Five year Plan after considering the above is estimated to be **702.80 Million Tonnes**. The details are at **Annexure-2.5**.

2.1.3.4 The expected capacity of 702.80 Million Tonnes at major ports at the end of 11th five year plan will be more when compared to the targeted traffic of 600.60 Million Tonnes at major ports.

2.1.4 Finance Outlay:

2.1.4.1 The total plan outlay for the 11th Plan was **Rs.30305.16 crore** comprising of Rs.3749.00 crore as Gross Budgetary Support and Rs.26556.16 crore through internal & external resource generation of the Ports/organizations. However, as per the year-wise allocation during the first four years of the 11th Five Year Plan, an amount of Rs.10388.87 crore was allocated out of which Rs.5185.29 crore was utilized, thereby showing a utilization of 49.91%. An amount of Rs.2499.32 crore has been allocated in 2011-12, which is presumably to be spent fully. Therefore, the year-wise allocation during five years of 11th Plan period adds upto Rs. 12888.19 crores. The year-wise allocation and anticipated utilization for the 11th Plan are shown below:-

Year	Plan Outlay* (Rs. in crore)	Expenditure incurred (Rs. in crore)	Percentage of Plan utilization
(A) Major Ports			
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	1143.51	70.71
2011-12	1849.09	1849.09	100.00
Total (A)	7471.02	5566.16	74.50

Year	Plan outlay* (Rs. in crore)	Expenditure incurred (Rs. in crore)	Percentage of Plan utilization
(B) DCI			
2007-08	300.00	123.30	41.10
2008-09	494.40	33.61	6.80
2009-10	495.50	62.54	12.62
2010-11	452.00	110.47	24.44
2011-12	498.43	498.43	100.00
Total (B)	2240.33	828.35	36.97
(C) ALHW(including Post Tsunami Work)			
2007-08	158.25	41.16	26.00
2008-09	96.00	53.97	56.22
2009-10	65.00	109.42	168.34
2010-11	108.80	107.26	98.90
2011-12	113.77	113.77	100.00
Total (C)	541.82	425.58	78.55
(D) SSCP			
2007-08	664.22	412.18	62.05
2008-09	1581.07	337.48	21.34
2009-10	161.10	20.98	13.02
2010-11	10.00	6.02	60.20
2011-12	12.10	12.10	100.00
Total (D)	2428.49	788.76	32.48
(E) WEB Based EDI Port Community System			
2007-08	7.50	0.04	0.53
2008-09	6.00	1.00	16.67
2009-10	3.00	3.33	111.00
2010-11	2.80	4.46	159.28
2011-12	2.37	2.37	100.00
Total (E)	21.67	11.20	51.68
(F) R&D, Assistance for minor ports & MSDC, IT for Dept. of Shipping, Development of Deep Sea Ports			
2007-08	19.01	3.71	19.52
2008-09	7.98	1.01	12.66
2009-10	4.40	0.7	15.91
2010-11	6.91	5.58	80.75
2011-12	8.56	8.56	100.00
Total (F)	46.86	19.56	41.74
(G) Survey vessels			
2007-08	19.00	0.00	0.00
2008-09	79.00	5.00	6.33
2009-10	10.00	10.00	100.00
2010-11	15.00	15.00	100.00
2011-12	15.00	15.00	100.00
Total (G)	138.00	45.00	32.61

Year Wise Total(A+B+C+D+E+F+G)			
2007-08	2109.27	1226.76	58.16
2008-09	3650.97	1309.26	35.86
2009-10	2416.00	1256.97	52.07
2010-11	2212.63	1392.30	62.92
2011-12	2499.32	2499.32	100.00
GRAND TOTAL	12888.19	7684.61	59.62

DCI – Dredging Corporation of India, ALHW – Andaman & Lakshdweep Harbour Works, SSCP- Sethusamudram Ship Channel Project, R&D – Research and Development Schemes

(*) Based on the year-wise allocated outlays.

2.1.4.2 The details of year-wise allocation to the port sector and the actual expenditure for the first four years of 11th plan is given under **Annexure-2.6**.

2.1.4.3 The variation of the actual (taking into account the anticipated expenditure for 2011-12) when compared with Approved Plan Outlay made for the eleventh plan is given under:

(Rs. in crore)

Approved outlay for 11th Plan	30305.16
Anticipated expenditure	7684.61
Variation	22620.55
Year wise approved Outlay	12888.19

2.2 Dredging Corporation of India (DCI):

2.2.1 The existing capacity of DCI Trailer Suction Dredgers (TSHD) and Cutter suction dredgers at the beginning of 11th Five year Plan was 73.60 million cubic meter & 6.25 million cubic meters respectively. The present capacity, as on 31.03.2012, of TSHD and CSD of DCI are 73.60 Mm³ and 11.85 Mm³ respectively. The details of TSHDs and CSDs of DCI are as under:

(a) Trailing Suction Hopper Dredgers (TSHD)

Sl. No.	Dredger	Year of Built	Dredging Depth (mts.)	Hopper Capacity (Cum)	Annual Capacity (M Cum)
01	DCI DREDGE - V	1974	22.00	3539	4.00
02	DCI DREDGE - VI	1975	22.00	3770	4.00
03	DCI DREDGE - VIII	1977	25.00	6500	9.00
04	DCI DREDGE - IX	1984	25.00	4500	6.50
05	DCI DREDGE - XI	1986	25.00	4500	6.50
06	DCI DREDGE - XII	1990	22.00	4500	6.50
07	DCI DREDGE - XIV	1991	22.00	4500	6.50
08	DCI DREDGE - XV	1999	25.00	7400	10.20
09	DCI DREDGE - XVI	2001	25.00	7400	10.20
10	DCI DREDGE - XVII	2001	25.00	7400	10.20
Total (A)					73.60

(b) Cutter Suction Dredger (CSD)

01	DCI DREDGE- VII	1976	20.00	1000	1.25
02	DCI AQUARIUS	1977	25.00	2000	5.00
03	DCI DREDGE- XVIII	2010	25.00	2009	5.00
04	DCI BACKHOE	2011			0.60
Total (B)					11.85
GRAND TOTAL (A+B)					85.45

2.2.2 The approved outlay for 11th Five Year Plan was Rs. 2292 crore. During 11th Five Year Plan, DCI has incurred an expenditure up to June 2011 of Rs. 406.41 crore and their anticipated expenditure by the end of 11th Five Year Plan is Rs.828.35 crore against year wise plan approved outlay of Rs 2240.33, which works out to 36.97%.

2.2.3 The following schemes were deferred in 11th Five Year Plan.

- One no.THSD of 9000 capacity and above.
- 2 no. Self propelled barges
- Retrofit to dredgers
- Multipurpose launch
- Land booster for Haldia shore pumping
- Land booster for CSDs

2.2.4 During 11th Plan (2007 - 2012), DCI has extended dredging services to the following Ports and other maritime establishments:

- Kolkata Port Trust
- Paradip Port Trust
- Visakhapatnam Port Trust
- Ennore Port Limited
- Cochin Port Trust
- New Mangalore Port Trust
- Mormugao Port Trust
- Jawaharlal Nehru Port Trust
- Southern Naval Command Cochin
- Sethusamudram Ship Channel project

2.2.5 Utilization of DCI Dredgers and quantities dredged during last five years ending 2011-12 are given at **Annexure-2.7**.

2.3 Andaman & Lakshadweep Harbour Works (ALHW)

2.3.1 Andaman & Nicobar Islands

2.3.1 (a) Tsunami Restoration Programme:

ALHW has created 56 nos. of various types of berthing facilities and ship repair facilities such as dry docks, slipways, etc by the middle of 10th Plan period in Andaman Nicobar Islands. Due to the devastating earthquake followed by Tsunami waves on 26th Dec 2004 almost all of the Port and Harbours structures suffered varying degree of damages. Govt. had sanctioned 976.19 crore under Tsunami Restoration Programme (TRP).

The total TRP projects have been categorized into three:

- 1) **Reconstruction/ Restoration:** with a target to complete all damaged infrastructure summing to 44 projects with estimated cost of Rs 286.23 crore.
- 2) **Development of addition facilities:** with an objective to develop additional port facilities across the A&N Islands. This plan has 40 projects with an outlay of Rs. 439.76 crore.
- 3) **Creation of additional facilities on Turn Key basis:** Major projects with an outlay of Rs. 250.20 crore to be taken up on Turn Key basis. These Projects are planned to be funded by A&N Administration under ACA.

A & N Administration has dropped some of as the alternatives were available. After the modifications, the total schemes to be funded as central schemes are given below:

1. Reconstruction/ Restoration: 40 projects with 279.04 crore.
2. Creation of addition facilities: 22 schemes with 322.77 crore.

Thus the total revised capital outlay for TRP projects to be funded through MoS has become 601.81 crore.

The ALHW have restored almost all of these facilities except at a few locations where restoration plans were modified during the project planning. These projects are also under progress.

After the revision the total projects are 62 out of which 33 projects of Reconstruction/Restoration of TRP and 15 projects of additional facilities of TRP have been completed. Balance works are under progress. Six projects are expected to be completed by March 2012. Eight projects are likely to spill over to 12th Five Year Plan.

The following important TRP works are completed during 11th Plan period.

- i. Reconstruction of Fisheries Jetty at Port Blair at a cost of Rs. 6.74 crore.

- ii. Rehabilitation of breakwater at Campbell Bay at a cost of Rs. 12.15 crore.
- iii. Construction of jetty at Gandhi Nagar in North Andaman at a cost of 4.27 crore.
- iv. Providing 5 Nos. Tyre cranes at southern group of A & N Islands at a cost of Rs. 6.01 crore.
- v. Construction of jetties at Munak and Itui in Nancowry group of Islands at cost of Rs. 5.45 crores and Rs.4.42 crore respectively.

Some of the Major schemes expected to spill over to 12th Plan in A & N Island are as under:

- Replenishing damaged breakwater and approach to wharf at Hut Bay in Little Andaman costing Rs. 78.93 crore approx.
- Construction of additional Jetty for mainland vessels at Kamorta costing Rs. 48.00 crore.
- Reconstruction of office building complex of ALHW at Port Blair costing Rs 11.76 crore.
- Development of Jungly Ghat Harbour- Phage 2 costing Rs. 78.93 crore.

2.3.1 (b) Plan Schemes:

During 11th Five Year Plan the following plan schemes in Andaman Nicobar have been completed:

- i. Deep water wharf the Campbell bay in Great Nicobar Islands costing Rs. 16.64 crore.
- ii. Replacement by providing 25 ton ELL crane 25 ton Fork Lift including transport vehicle at a cost of Rs. 9.16 crore.
- iii. Junglighat harbour phase I costing Rs. 17.44 crore.
- iv. Development of I.T. Infrastructure in ALHW costing Rs. 0.89 crore.

All the plan schemes in Andaman Nicobar Islands have been completed during the 11th plan period itself.

2.3.2 Lakshadweep Islands

All inhabited Islands of Lakshadweep are provided with ferry jetties located inside lagoon, whereas two Islands i.e. Androth and Kalpeni are provided with breakwater and wharf for catering to the ships having draft up to 1.8 meters. Government has sanctioned four projects at Agatti, Amini, Kavaratti and Minicoy Islands, for construction of open jetties at Eastern side of these Islands for berthing of ships plying between mainland and Islands.

2.3.2(a) Plan Schemes:

During the 11th plan period the following schemes have been completed/going to be completed by the end of 11th plan period.

Completed:

- i. Construction of Eastern side Embarkation facilities at Minicoy at a cost of Rs. 19.86 crore.
- ii. Construction of Eastern side Embarkation facilities at Agatti at a cost of Rs. 19.48 crore.

Under Progress, expected to be completed by March 2012:

- i. Construction of Eastern side Embarkation facilities at Kavaratti at a cost of Rs. 20.44 crore.
- ii. Construction of Eastern side Embarkation facilities at Amini at a cost of Rs. 21.51 crore.

The following scheme is expected to spill over to 12th Five Year Plan:

- i. Procurement of Cutter suction dredger for Lakshadweep coast at a cost of Rs. 4.93 crore.

2.3.3 The expenditure incurred by ALHW till July 2011 was Rs. 393.00 crore during 11th Plan period. ALHW is expected to spend Rs. 425.58 crore against the actual allocation of 541.82 crore, works out to 78.55%

2.4 SETHUSAMUDARAM SHIP CHANNEL PROJECT

2.4.1 To ensure that vessels moving between eastern and western coasts of India could have a continuous navigable route within India's own territorial waters, the implementation of Sethusamudaram Ship Channel Project envisaging cutting of a channel to connect the Gulf of Mannar and Bay of Bengal through Palk Strait and Palk Bay is underway.

2.4.2 The dredging in Adams Bridge region has been stopped in view of the hon'ble Supreme Court Order dated 31st August, 2007 and 14th September, 2007. Pursuant to orders of the Hon'ble Supreme Court, a committee of Experts has been constituted under the Chairmanship of Dr. R.K. Pachauri, Director General, the energy & Resources Institute to consider the alternative alignment in respect of the Sethusamudaram Ship Channel Project.

2.4.3 Accordingly an Expert Committee was formed under the Chairmanship of Dr. R. K. Pachauri, Director General, The Energy and Resources Institute, New Delhi. During its meeting the committee has decided to go for detailed EIA Study for the alternative alignment. The EIA Study was carried out by National Institute of Oceanography (NIO) for one year covering all aspects and draft final report was submitted to the committee during July 2011, which is under the scrutiny of the committee. The Expert Committee is expected to forward its recommendations to Government shortly, which will be submitted to Hon'ble Supreme Court for Judgment.

2.4.4 Due to prolonged court cases and some other internal problems, DCI has stopped the dredging works at PalkBay/Palk Strait also from 26.07.2009. During 11th Plan period total 28.42 Mm³ capital dredging was carried out.

2.5 R & D Schemes

2.5.1 An outlay of Rs. 1.90 crore was provided for R & D schemes (misc. studies) in the 11th plan for the ongoing as well as new schemes, against which the anticipated expenditure will be about Rs. 1.55 crore.

SL. No.	Nomenclature	Amount (Rs. In crore)
1	Assistance to State Government for Development of minor ports	0.98
2	MSDC meeting	0.35
3	Misc studies	0.57
	Total	1.90

2.5.2 During the 11th plan period, the following three schemes have been completed.

Sl. No.	Name of the Scheme	Agency
1.	Study of the impact of alluvial meanders & tributaries on the river Bhagirathi Hughli River System.	Kolkata Port
2.	Improving durability and strength of plain and reinforced concrete used in ports and harbor and off-shore structure with addition of Ground granulated blast furnace slag	IIT Roorkee

2.5.3 The schemes at Sl. No. 1 & 2 have been sanctioned and the scheme at Sl. No. 3 is likely to be sanctioned during 11th plan.

Sl. No.	Name of the Scheme	Agency
1.	Interaction of ships with basin entrance and approach channels	IIT Chennai
2.	FRP Laminated Sand witch panels for bridges/walkways of Marine structures	IIT Roorkee
3.	Geo-Hydro Morphological studies of three tributaries and their impact on sedimentation with respect to some critical stretches in Hooghly river and estuary.	Kolkata Port

2.5.4 In order to encourage Research activities in the Ministry, Research papers are being invited annually from the Year 2004-05, from Indian citizens and one maritime award each in port, shipping and inland water transport sector and in General Category are given. A participation certificate is also being issued to all participants. Every year a compendium of research papers has also released for distribution to major ports. State ports etc., for their reference and use.

2.6 Review of schemes planned during 11th plan period:

2.6.1 Organization-wise details of outlay & variation in expenditure are given in **Annexure-2.8.**

2.7 Productivity in Major Ports

2.7.1 The productivity parameters have generally shown a steady improvement in the 11th Five Year Plan. The actual Port productivity achieved during the last five years is shown below:

YEAR	Productivity Parameters		
	Average output per ship berth day (Tonnes)	Average turnaround time (Days)	Average pre-berthing detention time (Hours) (On Port A/C)
2006- 07 (10 th Plan)	9745	3.62	10.05
2007-08	10071	3.93	11.40
2008-09	10473	3.87	9.55
2009-10	10482	4.42	11.75
2010- 11	10735	4.67	11.76

2.8 Private Sector Participation in Major Ports

2.8.1 Upon the entry of private sector in the Ports sector as a sequel to the opening up of the Indian economy a Model Concession Agreement (MCA) has been finalized after detailed inter- Ministerial consultations to ensure transparency in the selection process for award of contracts and to enable the ports to have a standard model for concession agreements with the scope of making project / commodity specific alterations to suit the specific requirements of the project. The objective is to give a fillip to private investment in the port sector estimated at Rs. 36,868.00 crore in the eleventh Five year Plan. Model documents for Request for Qualification (RFQ) and Request for Proposal (RFP) has also been finalized and circulated among all the major ports so as to ensure the uniformity in the selection process in the award of contracts. With the experience gained in the award of PPP projects in the past few years, the RFQ documents were reviewed to streamline the process of award of contracts. The amendments have been given effects to after emergence of consensus among various stakeholders, viz. bidders. Concessioneering Task force constituted for revising RFQ have has been circulated to all ports maintaining uniformity in invitation for bids.

2.8.2 During 11th Plan period, award on PPP projects was commenced only in 2009-10 as first two year of 11th Plan were spent in finalizing of MCA document. The details of year wise investment are as follows:

Years	Investment (Rs. In Crore)	Capacity Addition (In MMT)
2007-2008	703.34	7.50
2008-2009	749.43	18.00
2009-2010	618.95	19.50
2010-2011	3147.13	30.50

2.8.3 The Status of PPP projects, as on September, 2011, are as follows:

Status	No. of Projects	Investment (Rs. In Crore)	Capacity Addition (In MMT)
Completed/ Operational	29	9116.40	193.84
Under Implementation	25	17,880.00	221.25
Identified for award in 2011-12	24	14,363.63	230.37

2.8.4 The list of Major Private sector/Captive Port projects is at **Annexure-2.10**(List of projects developed during the 10th Plan through private sector participation is at **Annexure-2.9**). The list of Private Sector/Captive Port projects under implementation/construction is at **Annexure-2.11(i)** and list of projects under implementation through Government/Port funding is at **Annexure-2.21(ii)**. The list of projects under planning/bidding is at **Annexure-2.12**.

2.9 OTHER MAJOR INITIATIVES:

2.9.1 Maritime Agenda 2010-20

One of most important initiatives of Ministry of Shipping is the formulation of a comprehensive **Maritime Agenda : 2010-2020**, which aims at facilitating enhanced private investment, improved services and port performance at par with the best practices in the world, increasing the volume of coastal shipping and facilitating hassle free multimodal transport, promoting use of the inland waterways for cargo movement. The important items in the agenda are increase of port capacity,

compatible technology for efficiency, safety and security, environment safeguards, Human Resources development, strengthening of Inland Waterways, Institutional development, etc.

2.9.2 National Maritime Development Programme

2.9.2.1 The National Maritime Development Programme has been formulated during 2005 envisaging an investment of Rs.1,00,339.00 crore, comprising 276 projects covering all major ports entailing activities like construction / up gradation of berths, deepening of channels, rail/road connectivity projects, etc. at a cost of Rs.55,804.00 crore and 111 projects covering tonnage acquisition maritime training , coastal shipping , aids to navigation, shipbuilding and building up of IWT infrastructure at a cost of Rs. 44,535.00 crore.

2.9.2.2 The share of the private sector investment in the ports sector was expected to be about Rs. 34,505.00 crore mainly consisting of commercially viable projects like development and operation of berth, terminals, etc. Public funded projects would cover the activities like creation of common user infrastructure facilities. The objective is to upgrade and modernize the infrastructure in India considering global standards as the benchmark. Some of the projects included in the programme have been completed.

2.9.2.3 Out of 276 projects identified for Major Ports, at present, 67 projects have been completed as on September 2011 and work is in progress in 70 projects. The status of NMDP projects are as follows:

Category	No of Projects	Estimated Cost/ Expenditure
Projects Completed	67	7187.85
Work In progress	70	18583.04
Approved & Yet to be awarded	18	3255.49
Firmed up and under process of approval	24	10779.87
Under Planning Stage	68	18654.64
Dropped	29	6269.14
Total	276	64730.03

2.9.3 Rail/Road Connectivity:

2.9.3.1 During the year 2006, Ministry of Railways announced its new Container Train Policy wherein it allowed Private Operators to obtain licences for operating container trains on Indian Railways network. The policy was conceived with a view to attracting greater share of container traffic for Railways and for introducing competition in rail freight services. Railways has given licences to 16 private operators to run trains till date.

2.9.3.2 Ministry of Railways has undertaken the Construction of a Dedicated Freight Corridor (DFC) between Delhi and Mumbai. It will be a high speed rail connection with multi modal linkages connecting 1483 Kms in length, covering 6 states of India. The focus of the DFC is to ensure high impact developments within 150 Km distance on either side of alignment of DFC.

2.9.3.3 There is a proposal for a 'Logistics Corporation of India' to be created jointly by three public sector undertakings which is in the preliminary stages.

2.9.3.4 In this, Shipping Corporation of India, CONCOR and Central Warehousing Corporation of India will be the equity partners in the multi-modal joint venture logistics company. The proposed corporation will provide integrated transport services as an integrated entity by the three public sector corporations as partners. Such an entity should be able to resolve the problems in ensuring seamless movement of cargo, and to provide an 'end-to-end transport solution.' CONCOR and the Warehousing Corporation can take care of the rail and road segments of the chain and Shipping Corporation can provide the shipping link. SCI, CONCOR are keen in this proposal. CONCOR already had a tie-up with the Mumbai-based private shipping line, Shreya Shipping for movement of containers.

2.9.3.5 Such services can also be provided by the private sector, at later stages and at present public sector should take the lead.

2.9.4 Trade Facilitation – Port Community System (PCS)

- 2.9.4.1 Ministry of Shipping is taking a number of trade facilitation initiatives. One of them is Implementation of Port Community System(PCS) at Major and Non-Major Ports, to enable inter organizational exchange of data for
- *Speedy clearance and increase the efficiency in ports*
 - *Maintaining the competitiveness of the Indian exporters in the global market*
 - *Increasing the transparency in submission of trade document electronically*
- 2.9.4.2 PCS 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, CONCOR/Railways, etc. through common interface with the following key features:
- *Single window system for the stakeholders of Maritime transport*
 - *On-line request for services*
 - *24 * 7 submission convenience & support*
 - *ePayment (on-line payment) for services with multiple banks*
 - *Timely alerts and email notifications in case of exceptions*
- 2.9.4.3 Already vessel, cargo, container, Transport, Finance related messages and e-payment module with 14 banks have been made ONLINE. Regarding, Port-Customs messages interface, one messages (VESPRO) was made LIVE in Dec 2010 and Eight messages (IGM, BE, Out of Charge, Transshipment Permit, Shipping Bill, LEO, Allotment of Rotation Number, Cargo Movement Approval) were made LIVE from 1st June 2011 in phases and other messages are likely to be made LIVE soon.
- 2.9.4.4 PCS has been implemented at Major Ports and Non-Major Ports like Mundra, Pipavav, Dahej. Efforts are being made to bring other non-major ports also under the ambit of PCS.
- 2.9.4.4.1 Around 8-9 lakhs messages are being exchanged between Stakeholders every months.

Annexure-2.1

Port Capacities as on 31.3.2007 (Taking into account the Reassessment of existing capacities)

Sl. No.	COMMODITY	KOPT	HDC	PPT	VPT	CHPT	ENNO	TPT	COPT	NMPT	MGPT	MBPT	KPT	J.N.P	TOTAL
1	P.O.L	3.60+ 4.0 (7) +A	17.00 (3+2BJ)	6.00 (1)	17.15 (4)	11.25 (2)		2.30 (1)	11.20 (3)	21.20 (4)	1.50 (1)	32.00 (5)	46.00*+ 0.4 (7+3SB M)+ A	5.50 (2)	174.70 + 4.4 (40+3SBM+ 2BJ) + A
2	IRON ORE		4.00 (1)	4.50 (1)	12.00 (1)	8.00 (1)				7.50 (1)	21.50 (1+Trans)				57.50 (6+Trans)
3	COAL (THERMAL)		7.00 (2)	20.00 (2)			13.00 \$ (2)	6.22 (2)							46.25 (8)
4	FERTILISER			7.50 (2)	1.00 (1)				0.60 (1)						9.10 (4)
5	GEN. BREAK BULK CARGO	5.00 + 0.5 (22)+A	11.50 (7)	18.00 (8)	26.65 ** (15)	15.55** (14)		7.00 (9+B Zone)	4.27 ^ (8)	12.60 (8)	7.00 (4)	9.15+ 6.00 (40)+ A	11.70+ 0.5 (10)+ A	0.70 (1)	129.12+7.0 (146+B Zone) + A
6	CONTAINERS	4.80 (4)	4.00 (2)		1.70 (1)	15.20 (4)		5.00 (1)	4.08 (3)			3.50 (4)	3.60 (1) #	46.20@ (9)	88.08 (29)
	In Lakhs TEUs	4.00	3.33		1.42	12.66		4.17	3.40			2.92	3.00	38.50	73.40
TOTAL		13.40 + 4.5 (33) + A	43.50 (15+2BJ)	56.00 (14)	58.50 (22)	50.00 (21)	13.00 (2)	20.55 (13+B Zone)	20.15 (15)	41.30 (13)	30.00 (6+Trans)	44.65 + 6.0 (49)+ A	61.30+ 0.90 (18+3SB M) + A	52.40 (12)	504.75+ 11.40 (233+3SBM+ Trans+2BJ+B Zone + A)

\$ ENNORE: Capacity of Ennore Port is 13.0 MT considering the capacity of fully equipped First Berth (8MT) and partially equipped Second Berth (5MT).

** VIZAG & CHENNAI: There is a reduction of capacity at berth no. 7 (0.5MT) due to decommissioning of berth for repairs in VPT and At ChPT at berths EQ(1.5 MT) & SQ3(0.5MT) due to decommissioning of berths for development of Second Container Terminal.

^ COCHIN: Berth Q7 has been shown as container berth during this year at Cochin Port.

* KANDLA: Capacity of 5 POL berths(10MT), IFFCO berth(3MT), and anchorages(0.40MT)=16.40MT, Balance 30MT capacity for 2 SPM of IOC(21MT) & ESSAR SPM(9MT).

KANDLA: Capacity of 3.6 MT will be added after commissioning of berth no. 12.

@ JNPT: Capacity of JNP container terminal(3 berths), NSICT(2 berths), GTIPL(3 berths) & 1 shallow water berth has been taken as 15.0 MT, 14.4 MT, 15.6MT and 1.20 MT respectively.

**DETAILS OF CAPACITY ADDITION SCHEMES TAKEN UP IN
11TH PLAN (AS ON 31-3-2011)**

(In Million Tonnes)

SNo	Name of the Scheme	Capacity additions during 11 th Plan
During 2007-08		
(a)	Construction of berth No.2 at Haldia Dock Complex	2.00
(b)	Construction of berth No. 13 at Haldia Dock Complex	1.00
(c)	SPM facility at Cochin Port for Kochi Refinery Ltd.	7.50
(d)	Addition due to productivity	16.82
During 2008-09		
(a)	Construction of berth No 9 at TPT	1.00
(b)	Construction of Marine Liquid Cargo Terminal at EPL	3.00
(c)	Container handling facilities at KPT (balance capacity)	3.60
(d)	Installation of SPM by IOC at PPT	15.00
(e)	Construction of new berth at Tuna at KPT	0.80
(f)	Decommissioning of P & V berth at MbPT	1.00
(g)	Addition due to productivity	20.30
During 2009-10		
(a)	Construction of second container terminal at ChPT	9.60
(b)	Construction of second product jetty by ESSAR in Vadinar of KPT	7.00
(c)	Construction of Ro-Ro berth at PPT	1.50
(d)	Reconstruction of Mattancherry Wharf in PPT	1.50
(e)	Addition due to productivity	22.36
During 2010-11		
(a)	Coal berth at EPL	8.00
(b)	Iron Ore berth at EPL	6.00
(c)	Development of General Cargo Berth at EPL	1.00
(d)	ICTT Vallarpadam Container Terminal at CoPT	12.50
(e)	Balance capacity of 9 th cargo berth at TPT	1.00
(f)	Addition due to productivity	24.90
	Total	165.38

Commodity-Wise Capacity of Major Ports as on 31.3.2011

(Taking into account the Reassessment of Port Capacities)

(IN MILLION TONNES)

S.No.	COMMODITY	KOPT	HALDIA	PPT	VPT	CHPT	ENNORE	TPT	COPT	NMPT	MGPT	MBPT	KANDLA	J.N.P.T	TOTAL
1	P.O.L	4.11+ 4.00 (7)+A	17.00 (3+2BJ)	21.00 (1)+ SBM	17.65 (4)	11.80 (2)	3.00 (1)	2.30 (1)	18.70 (3)+ SPM	23.37 (4)	1.50 (1)	32.00 (5)	62.83+ 0.8 (8+3SBM)+ A	5.50 (2)	220.76 + 4.80 (42+5SBM+2BJ) + A
2	IRON ORE		8.00 (2)	4.50 (1)	12.50 (1)	8.00 (1)	6.00 (1)			7.50 (1)	33.00 (1+Trans)				79.50 (8+Trans)
3	COAL (THERMAL)		7.00 (2)	20.00 (2)			21.00 (3)	6.25 (2)							54.25 (9)
4	FERTILISER			7.50 (2)	1.00 (1)				0.80 (1)						9.30 (4)
5	GEN. BREAK BULK CARGO	6.51+ 0.51 (22)+A	14.70 (8)	23.50 (9)	32.28 (15)	17.92 (14)	1.00 (1)	13.49 (10)	8.98 (12)	14.70 (8)	7.40 (4)	11.53 + 6 (25)* + A	16.88 (11)	0.90 (1)	168.79 + 6.50 (140) + A
6	CONTAINER	5.73 (4)	4.00 (2)		2.50 (1)	42.00* * (7)		5.00 (1)	12.50 (2)			1.00 (1)	7.20 (2)	57.60@ (9)	137.53 (30)
	In lakhs TEUs	4.58	3.33		2.08	35.00		4.17	10.00			0.83	6.00	45.50	114.19
TOTAL		16.35+ 4.50 (33)+A	50.70 (17+2BJ)	76.50 (15)+ SBM	64.93 (22)	79.72 (24)	31.00 (6)	27.04 (14)	40.98 (19)+ SPM	45.57 (13)	41.90 (6+Trans)	44.53 + 6 (31) + A	86.91+ 0.8 (21+3SBM) + A	64.00 (12)	670.13 + 11.30 (233+5SBM+ Trans+2BJ+A

Figures in the parenthesis indicate number of berths. BJ= Barge Jetty, SBM= Single Buoy Mooring, SPM= Single Point Mooring, Trans= Transhippers and A= Anchorage.

@ Capacity of JNP container terminal (3 berths), NSICT (2 berths), GTIL (3 berths) and shallow water berth (1 no) has been taken as 15.0MT, 15.0 MT, 26.40 MT 1.20 MT respectively. Capacity of one shallow water berth at JNPT is 0.90 MT for dry bulk cargo.

Berth no. 2&4 of Indira dock of Mumbai Port has been redesignated as general cargo berths. As P & V dock (18 berths) is being converted as container storage yards the capacity & number of berths have been taken as nil.

** Capacity of Chennai Port 1st Container Terminal (4 Berths) and IInd Container Terminal (3 Berths) has been taken as 24.00 MT and 9.60 MT respectively.

**DETAILS OF THE PROJECTS EXPECTED TO BE
COMPLETED BY 31.03.2012**

Sl. No.	Name of the Scheme	CAPACITY (In MTPA)
1	Construction of Coal Berth at NBW for NLC – TNEB(NCBI) at TPT	6.30
2	Development of coal handling facilities for captive user at NMPT	5.40
3	Procurement of one RMQC and shifting of two old RMQC at SWB at JNPT	1.87
4	Increase in draught at existing dock system for 12.5m to 14.0m to cater to panamax vessels at PPT	5.00
5	Mechanization of Central Quay3 Berth at PPT	4.00
6	Modification to Tuna for barge handling at KPT	0.40
7	Phase II Deepening at VPT	1.20
8	Strengthening of 3 berths at VPT	0.50
9	SPM as JV (HPCL) at VPT	8.00
	Total	32.67

Expected Capacities of Major Ports as on 31.3.2012

(IN MILLION TONNES)

S.No.	COMMODITY	KOPT	HALDIA	PPT	VPT	CHPT	ENNORE	TPT	COPT	NMPT	MGPT	MBPT	KANDLA	J.N.P.T	TOTAL
1	P.O.L	4.11 (7) +A	17.00 (3+2BJ)	23.50 (1)+ SBM	25.65 (4)	11.80 (2)	3.00 (1)	2.30 (1)	18.70 (3)+ SPM	23.37 (4)	1.50 (1)	32.00 (5)	62.83 (8+3SBM)+ A	5.50 (2)	231.26 (42+5SBM+2BJ) + A
2	IRON ORE		8.00 (2)	8.50 (1)	12.50 (1)	8.00 (1)	6.00 (1)			7.50 (1)	33.00 (1+Trans)				83.50 (8+Trans)
3	COAL (THERMAL)		7.00 (2)	22.50 (2)			21.00 (3)	12.55 (2)		5.40		6.00	9.80		68.45 (9)
4	FERTILISER			7.50 (2)	1.00 (1)				0.80 (1)						9.30 (4)
5	GEN. BREAK BULK CARGO	6.51 (22)+A	14.70 (8)	23.50 (9)	32.98 (15)	17.92 (14)	1.00 (1)	13.49 (10)	8.98 (12)	14.70 (8)	7.40 (4)	11.53 (25)* + A	17.28 (11)	0.90 (1)	170.89 (140) + A
6	CONTAINER	5.73 (4)	4.00 (2)		2.50 (1)	42.00* *		5.00 (1)	12.50 (2)			1.00 (1)	7.20 (2)	59.47@ (9)	139.40 (30)
	In lakhs TEUs	4.58	3.33		2.08	35.00		4.17	10.00			0.83	6.00	45.50	114.19
TOTAL		16.35 (33)+A	50.70 (17+2BJ)	85.50 (15)+ SBM	74.63 (22)	79.72 (24)	31.00 (6)	33.34 (14)	40.98 (19)+ SPM	50.97 (13)	41.90 (6+Trans)	44.53 (31) + A	87.31 (21+3SBM) + A	65.87 (12)	702.80 (233+5SBM+ Trans+2BJ+A

Figures in the parenthesis indicate number of berths. BJ= Barge Jetty, SBM= Single Buoy Mooring, SPM= Single Point Mooring, Trans= Transhippers and A= Anchorage.

@ Capacity of JNP container terminal (3 berths), NSICT (2 berths), GTIL (3 berths) and shallow water berth (1 no) has been taken as 15.0MT, 15.0 MT, 26.40 MT, 1.20 MT respectively. Capacity of one shallow water berth at JNPT is 0.90 MT for dry bulk cargo.

Berth no. 2&4 of Indira dock of Mumbai Port has been redesignated as general cargo berths. As P & V dock (18 berths) is being converted as container storage yards the capacity & number of berths have been taken as nil.

** Capacity of Chennai Port 1st Container Terminal (4 Berths) and IInd Container Terminal (3 Berths) has been taken as 24.00 MT and 9.60 MT respectively.

Financial Review of 11th five year plan for Port sector

(Rs. In crores)

Name of the Port	Approved 11 th Plan Outlay	Annual Plan 2007-08		Annual Plan 2008-09		Annual Plan 2009-10		Annual Plan 2010-11		Annual Plan 2011-12 Outlay
		Outlay	Exp.	Outlay	Exp.	Outlay	Exp.	Outlay	Exp.	
1	2	3	4	5	6	7	8	9	10	11
(A) Major Ports										
Kolkata	267.63	7.05	26.02	10.47	16.85	11.00	15.81	13.50	6.84	15.39
Haldia Dock System	279.40	30.31	30.58	64.00	42.27	45.00	33.03	40.75	49.92	48.56
RR Schemes	374.96	0.01	0.00	0.50	0.00	2.00	0.00	1.00	0.00	1.00
Kolkata Total	921.99	37.37	56.60	44.97	59.12	58.00	48.84	55.25	49.76	64.95
Mumbai	4464.62	50.36	29.32	150.00	43.36	192.00	146.09	329.72	116.76	285.00
JNPT	1724.04	188.18	70.29	175.17	50.58	324.00	177.94	281.78	38.24	195.00
Chennai	1254.79	47.81	46.72	72.95	67.77	34.00	64.46	58.84	184.46	97.00
Cochin	1299.97	158.52	149.71	255.65	248.29	191.97	190.93	237.97	160.86	120.11
Visakhapatnam	1396.14	83.00	37.32	39.97	31.01	65.01	75.74	151.00	121.19	320.00
Kandla	1175.98	89.49	41.39	140.87	57.64	115.00	64.78	58.35	52.70	100.00
Mormugao	420.96	10.10	11.48	22.07	20.19	71.00	31.01	72.98	71.52	166.03
Paradip	1207.81	100.00	87.05	288.00	101.48	276.51	128.19	139.74	81.26	160.00
New Mangalore	1009.00	36.00	29.25	30.00	30.20	34.00	32.48	31.50	24.56	36.00
Tuticorin	1448.20	79.46	52.71	96.87	65.12	220.50	39.02	52.96	172.08	195.00
Ennore Port Ltd.	1227.74	61.00	34.53	70.00	102.43	95.01	50.52	125.13	70.12	110.00
Sub-Total(A)	17551.24	941.29	646.37	1386.52	877.19	1677.00	1050.00	1617.12	1143.51	1849.09
(B) Others										
DCI	8142.00	300.00	123.30	494.40	33.61	495.50	62.54	452.00	110.47	498.43
ALHW+LHW	266.37	53.16	21.65	36.00	14.10	36.47	20.92	108.80*	107.26	17.77
R&D Studies		17.74	3.36	0.35	0.23	2.70	0.06			2.00
Assistance for minor ports & MSDC		1.27	0.00	0.98	0.10	1.20	0.15	4.35	4.59	0.40
IT for Dept. of Shipping	1425.65		0.35	0.20	0.68	0.50	0.49	2.56	0.99	6.16
Post Tsunami Works		105.09	19.51	60.00	39.87	28.53	88.50	0.00	0.00	96.00
PCS-EDI		7.50	0.04	6.00	1.00	3.00	3.33	2.80	4.46	2.37
Survey Vessels		19.00	0.00	79.00	5.00	10.00	10.00	15.00	15.00	15.00
SSCL	1919.90	664.22	412.18	1581.07	337.48	161.10	20.98	10.00	6.02	12.10
Development of Deep Sea Ports	1000.00	0.00	0.00	6.45	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total(B)	12753.92	1167.98	580.39	2264.45	432.07	739.00	206.97	595.51	248.79	650.23
Total (A+B)	30305.16	2109.27	1226.76	3650.97	1309.26	2416.00	1256.97	2212.63	1392.3	2499.32
* included Rs. 91.00 Crs. For Post Tsunami works										

Utilization of DCI Dredgers during last five years ending 2011-12**(a) Dredging days:-**

Dredger	Dredging Days				
	2007-08	2008-09	2009-10	2010-11	2011-12 (Target)
TRAILING SUCTION HOPPER DREDGERS (TSHD's):					
Dredge-V	96	268	201	293	275
Dredge-VI	187	146	231	274	261
Dredge-VIII	204	123	205	273	220
Dredge-IX	210	201	270	296	194
Dredge-XI	258	189	217	62	170
Dredge-XII	93	275	165	303	300
Dredge-XIV	317	74	311	296	247
Dredge-XV	273	305	180	235	275
Dredge-XVI	297	278	274	304	243
Dredge-XVII	312	311	243	279	258
Sub-total - 1	2247	2170	2297	2615	2443
CUTTER SUCTION DREDGERS (CSD's):					
Dredge-VII	189	248	32	159	125
Dredge-Aquarius	14	229	247	93	180
Dredge-XVIII	0	0	0	11	98
Sub-total - 2	203	477	279	263	403
Grand Total	2450	2647	2576	2878	2846

(b) Dredging quantities:-

Dredger	Dredging Quantity (M Cum)				
	2007-08	2008-09	2009-10	2010-11	2011-12 (Target)
TRAILING SUCTION HOPPER DREDGERS (TSHD's):					
Dredge-V	1.149	3.539	1.672	2.707	2.800
Dredge-VI	1.636	1.899	3.284	3.232	4.081
Dredge-VIII	3.670	2.053	3.323	8.076	3.483
Dredge-IX	34.01	2.957	3.669	4.067	2.956
Dredge-XI	4.167	1.698	2.262	0.658	1.900
Dredge-XII	1.153	4.970	3.445	6.111	6.600
Dredge-XIV	3.432	1.289	5.922	6.822	5.406
Dredge-XV	9.089	5.592	9.049	8.197	13.800
Dredge-XVI	7.512	4.544	6.344	6.931	7.334
Dredge-XVII	9.813	156.98	10.554	18.688	14.190
Sub-total - 1	45.022	44.239	49.524	65.489	62.550
CUTTER SUCTION DREDGERS (CSD's):					
Dredge-VII	0.945	1.354	0.088	0.668	0.400
Dredge-Aquarius	0.028	4.275	4.056	0.871	3.400
Dredge-XVIII	0.00	0.00	0.00	0.023	1.871
Sub-total - 2	0.973	5.629	4.144	1.562	6.071
Grand Total	45.995	49.868	53.668	67.051	68.621

(c) Dredging days targets vs Achievement during 11th Plan

Dredger	Age as on 2007 (yrs.)	Recommended dredging days per year during 11th Plan	Average(actual) dredging days per year during 11th Plan (2007-08 to 2011-12)
DCI Dredge- V	33	260	227
DCI Dredge VI	32	260	220
DCI Dredge VIII	30	260	205
DCI Dredge IX	23	260	234
DCI Dredge XI	21	260	179
DCI Dredge XII	17	265	227
DCI Dredge XIV	16	265	249
DCI Dredge XV	8	280	254
DCI Dredge XVI	7	280	279
DCI Dredge XVII	6	280	281

**Organization-wise details of Outlay and Variation in Expenditure
during 11th Plan**

(Rs in Crore)

Name of organization	Approved 11 th Plan outlay	Revised Requirement of 11 th plan	Variation (+) excess (-) savings
Kolkata (a)	921.99	279.27	(-) 642.72
Mumbai	4464.62	620.53	(-) 3844.09
JNPT	1724.04	532.05	(-) 1191.99
Chennai	1254.79	460.41	(-) 794.38
Cochin	1299.97	869.90	(-) 430.07
Vizag	1396.14	585.26	(-) 810.88
Kandla	1175.98	316.51	(-) 859.47
Mormugao	420.96	300.23	(-) 120.73
Paradip	1207.81	557.98	(-) 649.83
New Mangalore	1009.00	152.49	(-) 856.51
Tuticorin	1448.20	523.93	(-) 924.27
Ennore Port	1227.74	367.60	(-) 860.14
Total(A)	17551.24	5566.16	(-) 11985.08
SSCP	1919.90	788.76	(-) 1131.14
WEB Based EDI PCS	-	11.20	(+) 11.20
Others *	10834.02	1273.49	(-) 9560.53
Total(B)	12753.92	2073.45	(-) 10680.47
(C) Survey Vessels	-	45.00	(+) 45.00
Total	30305.16	7684.61	(-) 22620.55

(a) includes Haldia & RR schemes : (*) includes DCI,ALHW, R&D studies, Post Tsunami works, Minor port studies etc., PCS means Port Community System

MAJOR PRIVATE SECTOR/CAPTIVE PORT PROJECTS AND INVESTMENTS –10th PLAN

Sl.no.	Name of the project	Name of the Investor	Capacity (in MTPA)	Amount (in crores)
1	Container terminal at multi - purpose berth of Visakhapatnam	United Liner Agencies Limited & Dubai Ports International	1.74	100.00
2	Multi -purpose berth 4A of Haldia	International Sea Ports	1.5	150.00
3	Development of container freight station at Kandla	Central warehousing corporation	3.0	41.10
4	Allotment of multipurpose berth no 12 of Haldia port	Tata Martrade International Logistics Ltd.	0.50	30.00
5	Multi purpose general cargo berth 5A & 6A of Mormugao	M/s ABG GAO Limited	5.00	224.00
6	Multipurpose cargo berths EQ8 & EQ9 of Visakhapatnam	M/s Visag Seaports Limited	2.00	240.00
7	Redevelopment of existing bulk terminal into container terminal of J.N. Port	APM Terminal Mauritium & Container corporation of India	26.40	900.00
8	Oil jetty & Related facilities for ESSAR	M/s ESSAR	12.00	750.00
9.	Development & Operation of Container Terminal (Phase I)	M/s ABG Kandla Container Terminal Ltd	3.60	300.00
10.	Second Container Terminal in Chennai Port	M/s PSA SICAL Ltd	9.60	495.00

MAJOR PRIVATE SECTOR/CAPTIVE PORT PROJECTS COMPLETED

(As on Oct 2011)

S. No.	Name of the Project	Department/ Agency	Estimated Cost (Rs. In crore)	Capacity (in MTPA)	Date of Completion & Operation
(1)	(2)	(3)	(4)	(5)	(6)
1	Container Terminal, NSICT.	Jawaharlal Nehru Port Trust	965.00	15.00	Apr. 1999
2	BPCL Jetty	Jawaharlal Nehru Port Trust	200.00	5.50	Feb. 2002
3	Third Container Terminal	Jawaharlal Nehru Port Trust	900.00	26.40	30/10/2006
4	Bulk Cargo berths No. 5A & 6A	Mormugao Port Trust	250.00	5.00	June, 2004
5	Fifth Oil Jetty (IFFCO)	Kandla Port Trust	21.50	3.00	30/4/1998
6	Oil Jetty related facilities at Vadinar (ESSAR)	Kandla Port Trust	750.00	12.00	14/12/2006
7.	Oil Jetty awarded to M/s IOCL	Kandla Port Trust	20.70	2.00	01/03/2001
8	Container Freight Station	Kandla Port Trust	41.07	3.00	12/02/2004
9	Container Terminal (Phase I & II)	Kandla Port Trust	446.54	7.20	03/2007 12/06/2009
10	Container Terminal (Berth No.7)	Tuticorin Port Trust	100.00	5.00	21/12/1999
11	Container Terminal, Outer Harbour	Visakhapatnam Port Trust	108.00	1.74	26/06/2003
12	Multipurpose Berths – EQ-8 & EQ-9	Visakhapatnam Port Trust	196.00	2.00	EQ8- July 23, 2004 EQ9-Sept 6, 2005
13	Captive Fertilizer Berth	Paradip Port Trust	26.17	2.50	27/08/1999
14	Mechanisation of Cargo Handling Project-1 at Paradip Port	Paradip Port Trust	37.32	2.00	15 th Apr - 2009
15	Mechanisation of Cargo Handling Project-2 at Paradip Port	Paradip Port Trust	25.13	2.00	24 th Apr - 2009
16	Construction of SPM Captive Berth	Paradip Port Trust	500.00	15.00	28.12.2008
17	Captive Fertilizer Berth to PPL	Paradip Port Trust	100.00	2.50	3.8.1995

(As on Oct 2011)

S. No.	Name of the Project	Department/ Agency	Estimated Cost (Rs. In crore)	Capacity (in MTPA)	Date of Completion & Operation
(1)	(2)	(3)	(4)	(5)	(6)
18	Container Terminal at Chennai	Chennai Port Trust	400.00	24.00	7/03/2007
19	Development of 11nd Container Terminal	Chennai Port Trust	495.00	9.60	22/9/2009
20	Multipurpose Berth No. 4A	Kolkata Port Trust (HDC)	150.00	1.50	07/12/2003
21	Multipurpose Berth No. 12	Kolkata Port Trust	30.07	0.50	29/01/2002
22	Mechanisation at HDC Berth No. 2	Kolkata Port Trust	75.00	2.00	Sep. 2010
23	Mechanisation at HDC Berth No. 8	Kolkata Port Trust	75.00	2.00	Sep. 2010
24	Marine Liquid Terminal at Ennore	Ennore Port Ltd.	249.43	3.00	16/01/2009 (Operational)
25	Development of an Iron Ore Terminal on BOT basis at Ennore	Ennore Port Ltd.	360.00 (1 st Phase)	6.00	2/2/2011 (1 st Phase)
26	Development of Coal terminal for users other than TNEB on BOT basis at Ennore	Ennore Port Ltd.	399.13	8.00	2/2/2011
27	ICTT at Cochin Vallarpadam	Cochin Port Trust	1262.00 (1 st Phase)	12.50	11/2/2011 (1 st Phase)
28	Crude Oil handling facility	Cochin Port Trust	703.34	7.50	03/12/2007
29	Construction of Captive Jetty for handling Coal by M/s. NPCL	New Mangalore Port	230.00	5.40	Sep. 2011
Total			9116.40	193.84	

Annexure-2.11(i)**PRIVATE SECTOR / CAPTIVE PORT PROJECTS UNDER IMPLEMENTATION
(AS ON 1.10.2011)****(Rs in Crore)**

Sl. No.	Name of the Project	Port	Cost	Capacity (in MTPA)
(1)	(2)	(3)	(4)	(5)
1.	International Container Transshipment Terminal (ICTT) (Phase II to III)	Cochin	518.00	25.00
2.	LNG Regassification Terminal	Cochin	3195.00	2.50
3.	Iron Ore Terminal (Phase II)	Ennore	120.00	6.00
4.	Construction of two new off shore Container berths and development of Container terminal	Mumbai	1460.00	9.60
5.	Construction of Captive Jetty for handling Coal by M/s NPCL	New Mangalore	230.00	5.40
6.	Construction of Coal Berth at NBW for NLC-TNEB on captive basis	Tuticorin	49.00	6.30
7.	Development of 13 th multipurpose cargo Berth (other than liquid and container cargo Berth)	Kandla	188.00	2.00
8.	Construction of Deep Draft Iron Ore Berth	Paradip	591.00	10.00
9.	Construction of Deep Draft Coal Berth	Paradip	479.00	10.00
10.	Setting up of Mechanized Iron Ore Handling Facilities at Berth No. 14	New Mangalore	277.11	6.62
11.	Development of berth No. 7 for handling Bulk cargo	Mormugao	252.00	7.00
12.	Development of Western Quay (WQ-6) in the northern arm of Inner harbour	Visakhapatnam	114.37	2.00
13.	Development of EQ-10 berth in Inner Harbour for handling liquid cargo	Visakhapatnam	55.38	1.85
14.	Mechanised Coal handling facilities at General cum Cargo Berth (GCB) in the Outer Harbour	Visakhapatnam	444.10	10.18
15.	Mechanisation of Central Quay-III Berth	Paradip	40.00	4.00
16.	Multi-purpose berth Project	Paradip	387.31	5.00
17.	Development of Container Terminal	Ennore	1407.00	18.00
18.	Construction of NCB-II	Tuticorin	332.16	7.00

Annexure-2.11(i)**PRIVATE SECTOR / CAPTIVE PORT PROJECTS UNDER IMPLEMENTATION
(AS ON 1.10.2011)**

(Rs in Crore)

Sl. No.	Name of the Project	Port	Cost	Capacity (in MTPA)
(1)	(2)	(3)	(4)	(5)
19.	Development of 15 th multi-purpose cargo berth	Kandla	188.00	2.00
20.	Development of 16 th multi-purpose cargo berth	Kandla	189.00	2.00
21.	Development of Captive barge Jetty for IFFCO	Kandla	27.00	2.00
22.	Development of EQ 1 in Inner Harbour to handle Steam coal	Visakhapatnam	323.18	5.60
23.	Development of EQ 1A in Inner Harbour to handle Thermal coal	Visakhapatnam	313.39	5.60
24.	Development of 4 th Container terminal	JNP	6700.00	57.60
25	SPM by HPCL	Visakhapatnam	NA	8.00
	Total		17,880.00	221.25

Annexure-2.11(ii)**Capacity Addition Schemes under implementation
through Government/Port Funding (As on 1.10.2011)****(Rs in Crore)**

Sl. No.	Name of Scheme	Cost	Capacity (in MTPA)
1.	Construction of POL berth in New Mangalore Port	79.17	7.80
2.	Harbour wall berth 18-21 of Indira dock of Mumbai Port	353.00	8.00
3.	Enhancement Draft at existing dock from 12.5 m to 14.0 m at Paradip Port	40.00	5.00
4.	Deepening of channel at Visakhapatnam from 11.0 m to 14.0 m at Inner harbor	350.04	1.20

Projects under Planning/Bidding

(As on 1.10.2011)

S.No.	Project Name	Department/ Agency	Est. Cost (In Rs Crore)	Structure (BOO T/BOT)	Likely Date of Award	Remarks, if any
1	2	3	4	5	6	7
1	Construction of Outer Terminal 1 upstream of 3rd Oil Jetty with ancillary facilities on PPP basis (linked with transloading facilities at Kanika/Sandheads)	Kokata Port	290.00	BOT	Jan.2012	Concessionaire will handle min cargo of at least 70% of capacity through transshipment facilities within KOPT Limits RFQ issued on 7.2.11.
2	Installation of Mechanised handling facilities for fertilizers at EQ 7 in the Inner Harbour	Visakhapatna m Port	217.58	BOT	May 2011	RFP reissued Earlier single bid on 30.4.10 discharged Security clearance awaited
3.	Development of WQ 7 for handling Import Dry bulk cargo at	Visakhapatna m Port	180.00	BOT	Oct. 2011	Earlier RFP received poor response
4	Development of WQ 8 for handling break bulk cargo and export bulk cargo	Visakhapatna m Port	230.00	BOT	Jan. 2012	Earlier RFP received poor response
5.	Installation of Mechanised Iron Ore handling facilities at WQ-1 in the northern arm of Inner harbour of VPT for handling Dry bulk cargo at	Visakhapatna m Port	275.20	BOT	July 2011	PPPAC Memo under consideration -

6.	Creation of Mega Container Terminal	Chennai Port	3686.0	BOT	May,11	
7	Development of RO-RO cum multi-purpose berth & car parking at Bharthi Dock	Chennai Port	100.00	BOT	Feb, 12	
8	Development of Barge jetty at Bharthi Dock	Chennai Port	25.00	BOT	Feb, 12	
9	Construction of Shallow draft berth for handling cement	VOC Port, Tuticorin	86.17	BOT	Nov. 2011	
10	Upgradation of Mechanical handling equipment in berth no.1 to 6 and berth no.9	VOC Port, Tuticorin	80.10		Jan.2012	Decision taken to purchase cranes on PPP basis. SFC held on 10.11.10. Port was asked to convene pre bid meeting with prospective bidders and suggest views to be placed before SFC again.
11	Constn. of shallow draught Berth(2 Nos) for handling construction materials	VOC Port, Tuticorin	56.17	BOT	Jan 2012	
12.	Conversion of berth no- 8 as Container Terminal	VOC Port, Tuticorin	312.23	BOT	Court case filed by M/s PSA Sical challenging rejection of their RFQ	RFQ recd from PSA Sical kept in safe custody. Awaiting Supreme Court's order.
13	Development of NCB-III for handling thermal coal & rock phosphat at V.O.C. Port Trust	VOC Port, Tuticorin	420.00	BOT	Dec, 2011	

14	Development of NCB-IV for handling thermal coal & Copper concentrate.	VOC Port, Tuticorin	355.00	BOT	Dec, 2011	
15	Container of container truck parking terminal, CFS & Elevated Express way	VOC Port, Tuticorin	150.00	BOT	Not firmed	EOI Issued. RFQ will be issued later.
16	International Bunkering Terminal - Construction of Multi-purpose Liquid Terminal	Cochin Port	206.30	BOT	June 2011	RFP issued to shortlisted bidders on 21.12.10.
17	Development of 4 MMTPA mechanised Coal Import Terminal at Berth No.11	Mormugao Port	425.00	BOT	Feb.2012	Fishing Jetty has to be transferred.
18	Development of 7.2 MMTPA Iron ore export Bulk Handling Terminal west of breakwater	Mormugao Port	721.00	BOT	June 2011(Not Firmed up)	PPPAC approved on 25.1.11. .
19	Development of standalone container handling facility with a quay length of 330 m North of NSICT Terminal	JNPT	600.00	BOT	June 2011	Court case filed by M/s D.P. World in Supreme Court.
20	4th Container Terminal	JNPT	Ph—I-4100 Ph-II-2600	BOT	May 2012	Court case filed by M/s A.P.N. Terminal in Supreme Court.
21	Development of Dry Bulk Terminal off Tekra near Tuna	Kandla Port	1060.00	BOT	Jan 2012	.
22	Setting up of Single Point Mooring(SPM) and allied facilities off Veera in Gulf of Kutch	Kandla Port	621.53	BOT	March 2012	.
23	Upgradation of Barge Handling Facilities at Bunder Basin	Kandla Port	85.74	BOT	March 2012	.
24	Mechanisation of cargo berth No.7 & 8	Kandla Port	80.61	BOT	March 2012	
		T O T A L	14363.63			

CHAPTER - 3

EMERGING SCENARIO

3.1 Introduction

3.1.1 The emerging global economy has opened up new avenues in all the sectors in general and maritime sector in particular. The maritime sector through economic liberalization, competition, upgraded technology, application of modern information technology is being talked about world-wide. The impact has been very positive in India as also GDP growth rate attained newer heights during the recent past and projected to achieve 9.5% growth rate during the 12th Plan period. Globally also, apart from the last two years of economic meltdown, the overall emerging scenario is becoming very aggressive.

3.1.2 CONFIDENCE in the shipping industry has fallen to its lowest level in three and a half years because of overcapacity, declining freight rates, rising bunker costs and increasing uncertainty in global economy. According to a latest Shipping Confidence Survey report from international accountant and shipping adviser Moore Stephens, the average confidence level in August, 2011 responded by key market players in the shipping industry worldwide was 5.3, on a scale of 1 (low) to 10 (high), compared to 5.6 in the previous survey in May, 2011.

This is the lowest figure recorded since the survey began in May 2008 with a confidence rating of 6.8 - the highest so far. Richard Greiner, a shipper partner of Moore Stephens, said it was a disappointment to see a decline in shipping confidence. "Confidence remained surprisingly high last year, but it started to slip in 2011. Indeed in many ways, it is back to the levels of two years ago." Also, the report stated that confidence level among shipowners from June to August fell from 5.8 to 5.1, the lowest owner rating recorded during the life of the survey. Confidence levels among charterers were even lower at 5.0. And confidence on the part of ship managers dropped from 5.8 to 5.6, while brokers remained comparatively low rating of 5.1.

3.2 International and Domestic Factors Related to Seaborne Trade

3.2.1 After a contraction of 0.5 percent in 2009, global real output expanded by 5.0% in 2010 and is forecast to expand by 4.4% in 2011. Output of developing economies which grew by 2.7 % in 2009 posted a robust growth of 7.3 % in 2010 and is projected to expand at 6.5% in 2011. In advanced countries, however, growth is projected to be modest at only 2.4% in 2009 compared with a growth of 3.0 % in 2010 and contraction by 3.4 % in 2009. World trade volume that had plunged by close to 11 % in 2009, recovered by more than 12% in 2010 is expected to further expand by 7.4 % in 2011 (World Economic Outlook, April 2011, IMF). The global crises in 2008-2009 was exceptional in many ways: it was the first time in the post war period that the global GDP contracted, almost all the regions of the world were affected, and the time lag between the financial crises and its impact on the real economic activity was short. No region was spared by the crises. The global contagion hit some countries harder than others. While developing countries are leading recovery, it remains fragile and uneven in developed countries. Strong counter cyclical macroeconomic policies in most developed and developing economies helped the global economy to turn the corner, although rates of recovery are uneven across countries and regions.

3.3 Economic Liberalisation

3.3.1 Opening up of the economy results in increase in the volume of imports and exports. The mid term strategy outlined by the Export Import (EXIM) Policy of the Government of India envisages an increase in India's share in world trade from the current 0.80 percent to 1.5 percent. To meet such ambitious target, cost and speed have to be the essential factors in the movement of cargo. Inefficient port operation and inadequate port capacity not only increase the total transportation cost but also hinder the smooth flow of traffic through the port. Port congestion or detention to a vessel in the port retards the speed of cargo movement. Fast movement of cargo through ports is of vital importance to a shipper. The primary consideration of port users in the selection

of port for movement of cargo is the quality of service provided by the port at the least cost.

3.3.2 Liberalisation of trade has also resulted in the globalization of the manufacturing process, which in turn has led to a massive increase in trade, with the majority of these manufactured goods moving in containers. As competition increases, manufacturers and shippers strive to minimize transport costs. At the same time, they want guaranteed delivery time and the ability to know the location of their goods on a real time basis. Port users have been putting enormous pressure on authorities to improve cargo handling efficiency, reduce port costs, and provide facilities to meet the changing demands of the ships and cargoes. Liberalisation has brought in competition in the provision of efficient and customer based services by the port management. The ports which will be able to meet the challenges posed by the competition will emerge as winners and will flourish in the long run.

3.4 Competition

3.4.1 Indian economy is at the threshold of a golden age of growth. Goldman Sachs economists say that over the next 50 years, what they call the BRIC economies (Brazil, Russia, India and China) could become a much larger force globally. The Goldman Sachs economists predict that India will overtake Italy in 2015, France in 2020, Germany in 2023 and Japan in 2032. China's economy will be larger than everybody else by 2016 and even larger than the US economy in 2041. Also they say: "India has the potential to grow the fastest over the next 30 to 50 years." Its GDP growth rate will stay above 5 per cent till 2050; China's will drop to 5 per cent by 2020 and to around 3.5 per cent in the mid – 2040s.

3.4.2 Global Competition has changed the world and therefore, the business today, whether large and small, search the entire world for customers, suppliers, labour, know-how, technical expertise, finance, etc. This has resulted in merger and amalgamation and joint ventures. Dubai Port International renamed as Dubai World had taken over world-

wide rights of P&O operations. Shipowners now group themselves to form consortia to reduce the cost and increase the capacity which results in enhanced market penetration.

3.4.3 Globalisation has its impact on the developments of ports in India. There is a clear trend towards the global ownership and management of port terminals as witnessed by the entry of P&O Lines, D P World, Maersk Lines, PSA, etc. in certain Indian Ports. This has resulted in transfer of a range of port related activities from mainly publicly owned to privately owned undertakings. Changes in the world economy, shifts in composition, magnitude and direction of international trade, innovations in shipping, advancements in cargo handling technology, greater need for multi-modal transport, higher capital intensity and massive private sector participation have been rapidly transforming the competitive scenario in the port sector.

3.4.4 In India, the competition has been noticed during the post liberalisation period due to emergence of large number of State and Private Ports and Private terminals within major ports. This has resulted in newly emerging private Ports within a Maritime State competing stiffly with the Major Ports in attracting/diverting the cargo from the latter by various means. Competition is emerging among the Major Ports and also in the ports within and outside the region. This has also compelled the Major Ports to pay more attention for improvement in productivity. Further, a terminal of the Major Port and that of BOT operator within the Major Port has made the port terminal to perform better to meet the competition from the BOT operator. An example of JNPT is worth mentioning. Similarly, intra-port competition exists in some ports, meaning thereby competition among terminals within a Port in terms of quality & service, tariff, technological support and environment friendly measures.

3.4.5 Another factor that enhances competition is due to the WTO negotiations on commitments in services, which include port services. Under Maritime Transport services, negotiations may lead to agreements where foreign firms would be able to compete for providing port services including pilotage, towage, stevedoring services, etc. This would throw open these services to be offered by outside agencies. If these

occur, there would be increased pressure on port authorities to divest some of the services rendered now.

3.4.6 To stay competitive, port authorities had to modernize and upgrade port facilities to meet the needs of the port users. However, the investment required and managerial capabilities will pose challenges to public port authorities.

3.5 Technological Changes

3.5.1 The shipping and cargo handling technologies are changing rapidly. The ship size is getting bigger and in tune, the harbours need to be deepened and modernized in superstructure. Cargo handling takes place in many forms: bulk, break bulk, liquid bulk and in containers. Containerized traffic is the most prominent type in the era of growing industrial exports. These changes have an influence on the method of working and labour deployment at the terminals. More mechanization, unitization of cargo and computerization are becoming imperative. Manning scales have to change. Workforce needs to be better educated and more skilled.

3.5.2 With the percentage of containerization growing steadily the growth of container traffic is becoming more and more significant. As per an ESCAP study conducted in 2005, it is estimated that by 2015, Asia's share of containerised exports will increase from 55% of the world total in 2002 to 64%, while the share of containerised imports is expected to rise from 46% to 53% during the same period. In order to meet this growing global demand, the Asian ports including ports in India have to adopt the modern cargo handling technologies.

3.5.3 The biggest container ship deployed has grown at a tremendous rate over the past few decades. The driving force has been international globalisation. Increased competition and economy of scale have fuelled the development of ever bigger ships. In the early 1970s, the biggest ship had a carrying capacity of about 2,000 TEU, compared to 15,000 TEU today. A question at large is, whether this development going to continue or will it be curbed by global warming and the carbon footprint. Large ships are green ships by virtue of the fact that the fuel consumption per TEU transported is

lower. The cost is also lower due to the economy of scale. Two decades ago, studies were published comparing two 4,000 TEU ships to one 8,000 TEU ship and showed a reduced total cost per unit. Today, a comparison between two 8k TEU ships and one 16k TEU shows the same trend. The capital cost for the bigger ship is in the order of 20% less and the fuel cost around 40% less, the exact numbers depend on the building price and fuel price. There is a gain to be made by going for bigger units, in terms of not only the cost, but also the carbon footprint. Slow steaming will also contribute to lower fuel consumption, even if more ships are needed in the loop to maintain the service schedule. So, bigger ships going at lower speed are what the world may be looking for in the years to come.

But, we all know that big ships need to be filled up to be able to reap the benefits. In times of fluctuating transport volumes, it is prudent to ask if big units provide the best solution for adjusting the transportation service supply to the demand. To accommodate such vessels, container hub ports must have access channels of sufficient depth, along with advanced and highly efficient terminal facilities.

3.5.4 Another example in this regard may be quoted about installation of World's largest ship to shore crane at Georgia Port. The 242 tonne crane is 142 m. long 114 m high with the boom raised. It can span 22 containers across and 6 containers high. The lift capacity of this crane is 65 tonne under spreader bar and 85 tonne under cargo beams.

3.5.5 Along with technological changes in Ports, changes in technology in other allied sectors are occurring. In transportation, dedicated freight corridors, High-speed Axle trains, double-stock box trains, etc are in reality in aiding faster evacuation & transportation of cargo from/to Ports.

3.6 Global Challenges Ahead

3.6.1 According to a study on Perspective of Changes in the Port Industry, made by IAPH , based on ESCAP forecasting assumptions, it has been indicated that “upto 8000

TEU vessel will be in operation by 2006, and upto 12000 TEU vessel size by 2011 on the major routes. Such assumption becomes a reality now with operation of over 15,000 TEU ship of the Emma Maersk class on the major routes. The handling rate is likely to be 160 moves per hour per berth in future. The Shippers' choice will be determined by cost of service, transit time, frequency and transshipment.”

3.6.2 Another study titled as “Regional Shipping and Port Development Strategies” conducted by ESCAP in 2005 has made the following findings:

- The total volumes of world international container handling will increase to 576.4 million TEU by the year 2015 with an annual average growth rate over the period of 6.9 per cent.
- The total volumes in the ports of ESCAP countries will increase from 133.7 million TEU in 2002 to 352.3 million TEU in 2015 at an annual average growth rate of 7.7 per cent.
- The study estimates that the world total trans-shipment volume of containers will increase from 58 million TEU in 2002 to 152 million TEU in 2015 at an average growth rate of 7.7 per cent per annum.
- The study estimates that the total volume of containers trans-shipped within the ESCAP region will increase from an estimated 42.2 million TEU in 2002 to 109.6 million TEU in 2015 at an average growth rate of 7.6 per cent per annum.

3.7 New Terminals and Global Investments

3.7.1 The ESCAP study further estimated that, in total, 927 new container berths will be required to meet anticipated world demand in 2015, of which 569 berths will be for the ESCAP region. The biggest share of this total is accounted for by East Asia, which will require over 270 new berths by 2015. South-East Asia and North Asia will require 148 and 65 new berths, respectively. It is estimated that 66 additional berths will be needed in the South Asia sub-region.

3.7.2 However, based on typical costs to develop new infrastructure and procure the handling equipment required to allow the terminal to operate at a satisfactory level of

efficiency, the total capital required has been estimated at approximately US\$ 55 billion, of which US\$ 36 billion for the ports in ESCAP region.

3.7.3 Another study by UK-based Ocean Shipping Consultants (OSC) analyses the dramatic development in container-handling activity at East Asian ports (includes North East, Far East and South East Asia) for the period up to 2020. Under so-called normal scenarios, OSC forecasts that total container port demand is set to increase by between 102% and 126% over the 2004-15 period, to a maximum threshold of 385 million TEU. By 2020, a further expansion of 20-27% will take the figure up to 487 million TEU. Under this increased-risk scenario, total East Asian container port demand is projected to grow by 88% to 321 million TEU by 2015 and by further 20%, to 386 million TEU by 2020. Despite the increased risks, the forecast for container port demand growth is still substantial.

3.7.4 On all trade routes cargo volumes are rising – and it is ports that are putting in the investment to make sure that world trade keeps moving. A Ports and Harbour survey of the world's 50 ports found that some \$40 Billion is being spent by them on infrastructure developments. To this conservative estimate must be added huge investments by terminal operators on equipment. The amount being spent by ports is probably close to the GNP of a country such as Egypt. In this year alone, \$700 Million worth of investments at other ports has been chronicled. This is only a sample of the information that gets published – much more is being spent by large and small ports alike.

3.8 Changes in Information Technology

3.8.1 As a result of fallout of 9/11 incident a number of new technologies have been introduced to help the implementation of International Ship & Port Security code in various countries. Now, ships tend to have GPS systems 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 quite cleverly in terminals to speed up the processing of containers in and out.

3.8.2 In latest generation Ports, optimization software is giving operators new opportunities to enhance their asset value. As a result, port planning software have been

developed which enable port operators to discover and overcome any operational problems before they start. Singapore's unchallenged position as a global transport hub can largely be put down to its geographic good fortune at a cross-road of world trade, but its astonishing throughput capacity is empowered by complex and innovative software managing operations at the port. At the heart of this, are PSA's Computer Integrated Terminal Operations System (CITOS) and Portnet. Together, these two integrated real-time e-commerce systems control all of PSA's colossal container-moving operations world-wide, from booking tug and berth applications to all the way through stevedoring, loading trucking, tracking and ship-planning and to final billing. As a sign of how accurate container software-controlled system works is demonstrated by the PSA Singapore Terminal system which processes one truck every 25 seconds and remotely operates yard cranes at the state-of-the-art Pasir Panjang Terminal. To meet the future requirements and to ensure its continued smooth handling, PSA has embarked on an upgradation programme to further streamline CITOS to CITOS21, making use of new technology.

3.9 Perspective of Indian Port Sector

3.9.1 India has been emerging as a modern economy. The Government is committed to ensure that the economy growth at 8% or more per year in a sustained manner over the next decade. In order to realize this growth potential, a number of policy initiatives have been taken during the recent past. Attention has been focused on improvement in infrastructure, modernization of existing facilities, better logistic chain, doing away with the licensing system, more openings in the domestic retail market with entry for the world class players, increased avenues for Special Economic Zone type of projects etc. Canalysing system has been done away with. Indian Oil Corporation, Oil Coordination Committee, have ceased to be the only agency for import of Petroleum crude and products. State Trading Corporation is no longer the canalysing agent for import of newsprint, edible oil, sugar and food grains. The role of Mineral & Metal Trading Corporation as the sole canalysing agency for import of fertilizers, rock phosphate and sulphur has been taken away. In the context of Port sector, Private Sector has been allowed to participate in the development of Port Infrastructure – new berths are being commissioned on BOT basis. Documentation procedures have become simple. To become globally competitive, utmost

importance has been placed on the development of physical infrastructure like roads, airports, seaports, railways in general and Port Sector in particular. Single window concept with web based Port Community System has been introduced in many Ports. Indian Ports, earlier developed to handle bulk and break bulk cargo, are developing more containerized handling facilities. Development of International Container Transshipment terminal at Cochin has fructified. Due to concerted efforts over the years, Jawaharlal Nehru and Chennai ports are attracting larger number of mother vessels for containers.

3.9.2 The improvement of technology in shipping – the size, fleet, design and capacity of the ships, inventions in the new method of handling of cargo has necessitated the Indian Major Ports to pay more attention in modernization of the port and upgradation of technology, induction of more sophisticated and modern method of handling of cargo to meet increasing demands. The increasing container penetration has resulted in downward trend in break bulk cargo and Indian Ports, earlier developed to handle bulk and break bulk cargo are gradually shifting towards containerized handling. In bulk cargo, rapid mechanization process has been introduced and manual operation has begun to decline. This has resulted in increased cargo throughput transferred between ship and shore and vice versa.

3.9.3 On the operational side, all the Major ports are attaining newer heights in terms of volumes as the traffic during the XI plan period has been growing reasonable rates despite of global recession in two/three years of the plan period. As may be seen from the following table, an all time record traffic of 570.03 MT was handled during 2010-2011.

TRAFFIC GROWTH AT MAJOR PORTS

(From 2007-08 to 2010-11)

Year	Traffic Handled (In million tonnes)	% Growth over Previous Year
2006-07	463.78	9.49
2007-08	519.32	11.97
2008-09	530.54	2.16
2009-10	561.09	5.76
2010-11	570.03	1.59

3.9.4 As far as the cargo composition is concerned, the pattern remains unchanged during the past 5 years. During 2010-11, POL traffic maintained predominant share of about 31.4%, followed by container and iron ore traffic around 20% and 15.3% respectively while the share of coal traffic was 12.8%. This clearly shows that the investment made at Major Ports in modern cargo handling equipment has resulted in growth of traffic over the years.

3.9.5 For the first time, the total cargo handling capacity in the Major Ports exceeded the actual traffic handled as on 31-3-2001 and the trend is still continuing. The capacity of the Ports as on 31.03.2011 was 670.13 million tonnes against the traffic of 570.03 million tonnes in 2010-11 with a capacity utilization of 85.06%, which is incidentally lowest during the last five years. It shows that the capacity available was more than the traffic at ports, which is an ideal situation.

Capacity Utilisation at Major Ports

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

3.10 EMERGENCE OF NON-MAJOR PORTS

Besides, the growth of traffic at major ports, one has witnessed the emergence of non-major ports and private ports particularly during the last few years. Though, the share of cargo traffic of the non-major ports has increased with a higher pace, Non-major ports in India collectively handled 314.64 million tonnes of traffic during the year 2010-11 as compared to 87.37 million tonnes of cargo handled in 2000-01. The Compound Annual Growth Rate (CAGR) of traffic during 2000-01 to 2010-11 achieved by Non-major ports was 13.7% as compared to 9.2% achieved by all the 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 from 23.7% in 2000-01 to 35.6% in 2010-11. This trend definitely shows the level of competition which Major Ports have faced during the last few years and is likely to continue in years to come and as per current indications, non-major ports will have an edge over major ports due to

their growth rates as a number of green field ports are coming up with huge capacities through private sector in non-major ports echelon.

3.11 Challenges ahead for Indian Ports

3.11.1 In order to meet the challenges emanating from intense global competition, advancement in Information & Communication Technology, technological changes in shipping and related sectors coupled with stiff demands from trade, ports in India are required to gear-up themselves by modernizing the port infrastructure, enhancing the quality of service and increasing the productivity level at par with International standards.

3.11.2 A number of initiatives have been taken during the recent past to bring the port sector at par with world standards like development of perspective plans for individual ports, releasing of a new RFQ, RFP & MCA documents, implementation of a comprehensive National Maritime Development Programme, etc. The most important is the formulation of a comprehensive **Maritime Agenda : 2010-2020**, which aims at facilitating enhanced private investment, improved services and port performance at par with the best practices in the world, increasing the volume of coastal shipping and facilitating hassle free multimodal transport, promoting use of the inland waterways for cargo movement. The important items in the agenda are increase of port capacity, compatible technology for efficiency, safety and security, environment safeguards, Human Resources development, strengthening of Inland Waterways, Institutional development, etc.

3.11.3 With all the above programmes, there is no doubt that the Ports of India are heading for a better future and ready to take up the challenges of India's growing international trade. At the same time, the operational efficiency of Major Ports have to be competitive and be at par with any of the ports of our region in particular and the ports of the world in general. Modern cargo handling techniques must be introduced to improve port performance in the Indian Major Ports, particularly in the dry bulk cargo, conventional and unitized general cargo trades. Proper policies and actions have to be taken up to deal with port efficiency, modernization (Including implementation of PCS), productivity, Public Private Partnership, Dredging requirement and Policy Frame work, Rail-Road connectivity, Human Resources

Development, Cruise Shipping/Coastal Shipping, Port Security, Environment Issues, Social Integration of ports, etc., which are dealt at length in this report.

3.11.4 Meanwhile, it is pertinent to mention that an attempt has also been made to compare the growth of traffic in Indian ports with some of the leading ports of the world but it is found that due to paucity of the related information for the same and also the composition and nature of cargo handled in India and elsewhere, it is not possible draw an parallel analysis in this regard. However, an attempt has been made to compare the growth achieved for container traffic for the last four years i.e., 2006-07 to 2009-10 for some of the top container handling ports of the world with India's leading container handling ports like JNPT and Chennai, since the handling methodology of boxes across the globe is almost same. Details of volume handled and the growth rate achieved on year-on-year is given as under:

PORT	CONTAINER THROUGHPUT (IN MTEUs)				Y-O-Y GROWTH (%)		
	2007	2008	2009	2010	2008	2009	2010
International							
Shanghai	26.15	27.98	25.00	29.07	7.00	-10.65	16.28
Singapore	27.94	29.92	25.86	28.43	7.09	-13.57	9.94
Hong Kong	24.00	24.25	21.04	23.70	1.04	-13.24	12.64
Shenzhen	21.100	21.41	18.25	22.51	1.47	-14.76	23.34
Dubai	10.650	11.830	11.10	11.60	11.08	-6.17	4.50
Rotterdam	10.790	10.800	9.74	11.14	0.09	-9.81	14.37
Antwerp	8.18	8.660	7.31	8.47	5.87	-15.59	15.87
Los Angeles	8.36	7.850	6.75	6.50	-6.10	-14.01	-3.70
India							
JNPT	3.30	4.06	3.95	4.28	23.03	-2.71	8.35
Chennai	0.89	1.13	1.14	1.22	26.97	0.88	7.02

As may be seen from the above statement that while most of the International Ports have attained single digit growth, the container traffic at JNPT and Chennai have recorded a growth of more than 23% during 2008. Similarly, the dip in the growth of leading container ports was negative during the year 2009 due to Global slowdown, but the negativity in growth was less than 3%, in JNPT whereas the traffic has grown by 0.88% at Chennai. Similar situation has been noticed in the year 2010 also when the Indian Ports has attained a respectable growth rate as compared to some of the top container handling ports like Dubai, Los Angeles etc.

CHAPTER - 4

APPROACH TO THE TWELFTH FIVE YEAR PLAN

4.1 The Approach Paper to the Twelfth Five Year Plan (2012-2017) prepared by the Planning Commission proposes the basic objective for the Plan period as faster more inclusive and sustainable growth. It suggests various measures that would promote greater inclusiveness and would ensure that the benefits of development reach the hitherto excluded people. The Approach Paper envisages that the GDP growth rate for the period 2012-17 will be 9%.

4.2 The extracts of the Approach Paper covering the Ocean ports is reproduced below:

1. It is imperative that the pace of expansion of the port sector is accelerated, building on the successful experience of the past few years and increased co-operation between the publicly owned ports and private container and other terminal operators, as well as the strengthening of established private ports.
2. The draft in most of our ports is not adequate for dealing with bigger ships, the use of which is an important component of reducing costs. Deepening of selected ports and also intermediate off-loading terminals offer solutions that should be carried forward in the course of the Twelfth Plan. The pace of dredging has been inadequate and needs to be greatly expanded.
3. The capacity for dredging of ports in the private sector needs to be further augmented and full operational flexibility given to the ports to use it. While capital dredging of ports will lead to further deepening and larger size ships will be able to use the ports, maintenance dredging will ensure a continued efficient operation of current port capacity.

4. Another constraint that has emerged is the lack of capacity / availability of rail and road networks linking ports especially the new minor ports coming up in the private sector. These connectivity projects should be identified on a priority basis and implemented using private participation wherever possible. In such cases the projects will need to be facilitated including in the matter of land acquisition.

4.3 In order to achieve the above broad objectives, the ports should formulate strategies, both long term and short term on the key areas during the 12th Plan period. The key areas, which need to be addressed to and the strategies to be focussed and are laid by the working group:

1. To formulate programme for development of Port facilities for handling the cargo during each year of the 12th Plan period separately indicating the physical targets and financial outlay requirements of replacements, modernization and augmentation of port capacity including sources of funding and taking into accounts (i) role of private sector and (ii) technological developments.
2. To examine and suggest measures for speedy and economic movement of containers to inland container depots.
3. To evolve the broad strategies to make Indian Ports to achieve international standards in terms of productivity, efficiency and cost – effectiveness keeping in view the need for making Indian ports more competitive and meeting the emerging requirements of sea transportation of Indian trade.
4. To evolve realistic productivity norms both for man and machinery and to suggest measures to improve the labour and equipment productivity at the port and emerging use of computerization to reduce labour intensive mode of handling operations and to prune administrative overheads.

5. To review the progress of Electronic Data Interchange / Port Community System at various Major Ports and suggest measures to remove bottlenecks, if any in its implementation.
6. To dwell upon and recommend the need for corporate social responsibility by the ports and way & means to accomplish the same. A broad policy of corporate social responsibility (CSR) for Major Ports may also be evolved.
7. It is estimated that the Indian Ports will have to handle cargo traffic of about 1758 MT by 2017 as compared to 885 MT handled in 2010-11. This would require substantial capacity augmentation at Major and Non-Major Ports.
8. To look into current status of port connectivity and container /freight traffic flow and examine the requirements of rail-road connectivity for each of the 12 Major Ports in the 12th Plan period and give a perspective for five years beyond 12th Plan.
9. To suggest the most viable financial model for implementation of rail-road connectivity including source of funds for the projects.
- 10.To review the progress made towards private sector participation in the development of ports in the 11th Plan and suggest measures for making investment in port sector by private sector more attractive in the 12th Plan.
- 11.To review the progress made towards corporatization of Major Ports and suggest remedial measures for speeding up the process of corporatization at Major Ports
- 12.To identify new areas of private investment in Ports.
- 13.To consider the guidelines and action plan to broaden the operational freedom to the Port authorities to invite private investment.

14. To review existing tariff policy with special reference to phasing of cross subsidies and suggest ways for the adoption of more realistic tariff policy for the port sector. The role of Traffic Authority for Major Ports may be reviewed with a view to making suitable recommendations.
15. To assess the impact of development new ports on the nearby Ports so that the capacity available in the existing Ports is not under-utilized and formation of joint venture for synergy of operations.
16. To assess dredging requirements of Major and Minor Ports and prepare a road map / dredging Plan for all Major Ports during 12th Plan.
17. To suggest measures to optimize the use of dredging fleet owned by Dredging Corporation of India (DCI) and port authorities.
18. To formulate programme for the development of dredging sector during each year of the 12th Plan indicating the physical targets and financial outlays, requirements for replacement, modernization and augmentation of dredging capacity. While formulating the Plan the following issues should be taken into account (a) role of the private sector in the dredging operations; (b) technological development ; (c) comparative cost of dredging operations by DCI and Ports won dredgers and (d) standardization of crafts and dredging equipment (e) sources of funding for channel deepening in ports.
19. To examine the existing status of coastal shipping and suggest the measures to increase the share of Coastal Shipping in the overall Port Traffic.
20. To recommend various Broad strategies to promote Cruise Shipping.
21. To examine the need for development of ship repair and maintenance facility in Indian ports and recommend various policy measures to increase the number of facility within the Coast.

22. To look into the areas of broad co-operation between Indian Ports and Ports of other countries. To identify the issues and matters, which inhibits international co-operation and suggests measures to remove those bottleneck.
23. To suggest Broad policy instrument by which bilateral and multilateral co-operation is sought to be achieved. To develop models by which Indian Ports will have their presence and stacks in the Ports of other countries.
24. To develop a broad framework to establish a special purpose vehicle (SPV) namely "Indian Ports Global" for overseas investment by Indian Ports. To explore the areas in which financial Aid / Assistance from international / multilateral organization can be sought.
25. To examine the concept of green ports and suggest steps to be adopted by Indian Ports to transform into the Green Ports at par with international Ports. To suggest various green practices to be adopted in the marine and port sector in collaboration with other sectors.
26. To explore the possibility of moving dirty and dangerous cargo out of the city based ports within an identified time frame. To assess the impact of handling of hazardous cargo on human habitation and port cities and suggest re-habitation strategies.
27. To recommend broad safety & security policy for the Indian Ports taking into consideration all the essential parameter including safety & security hazards.
28. To suggest measures for streamlining the procedures in obtaining early environment and security clearance.

29. To explore the different model for private participation in the port sector and recommend the same for promotion the private investment in port sector.

30. To suggest means / procedures for dealing with post-award developments.

CHAPTER-5

TRAFFIC FORECAST AND CAPACITY REQUIREMENT

5.1 Introduction

The pre-requisite for port planning and for formulating development programmes is assessment of Traffic likely to be channelled through the ports and capacity required for ports to handle the projected traffic. The factors which influence cargo traffic through the ports are (i) growth of population (ii) level of foreign trade and (iii) economic situation. The forecast made with reference to these economic variables serve as a guiding factor to assess the cargo flows. Though there are several qualitative and quantitative techniques available to assess the cargo flows, a combination of forecasting techniques viz. regression analysis; projections based on GDP & elasticity method; scenario writing and end use method and projections by Major & Non-major Ports based on their estimation of traffic & proposed capacity addition Plans to assess the demand for cargo flows through the Indian Ports have been used to forecast traffic. In the Regression analysis, time series data on the cargo throughput and the GDP are used as the two variables. Elasticity is a tool for measuring responsiveness of a function (cargo traffic at Ports) to changes in parameters (GDP) in a unit less way. For the scenario writing and end use method, developments in related sectors viz. power, oil, steel etc. are analysed.

5.2 Traffic Forecast

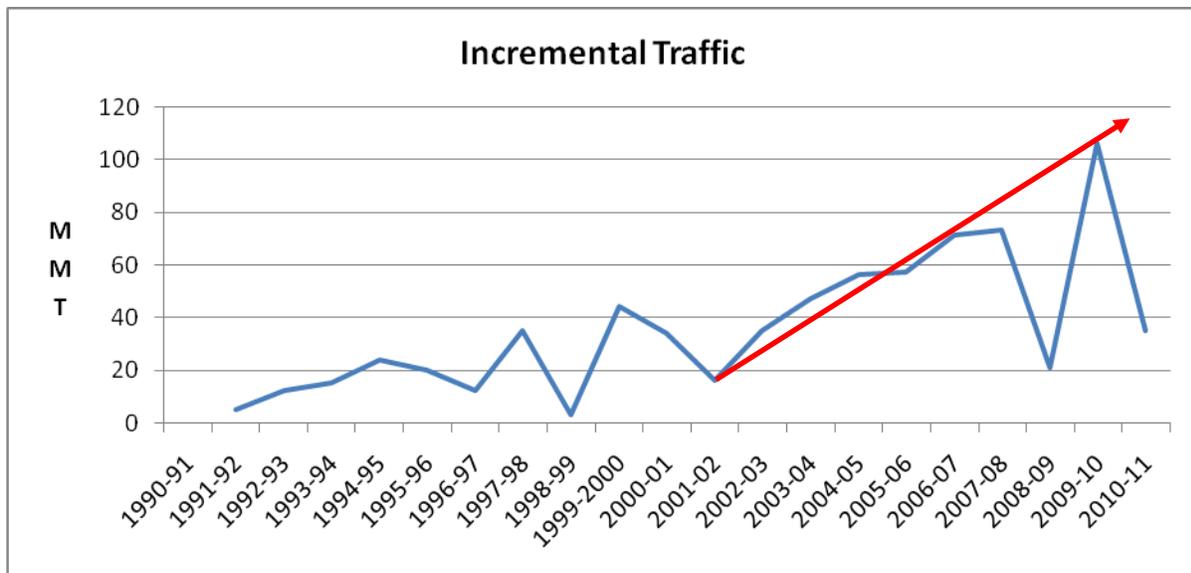
A: Regression Analysis

Traffic handled at all Indian Ports (major and non-major ports) from 1990-91 to 2010-11 is given in the Table 2.

YEAR	Total Traffic	Incremental Traffic
1990-91	164	
1991-92	169	5

1992-93	181	12
1993-94	196	15
1994-95	220	24
1995-96	240	20
1996-97	252	12
1997-98	287	35
1998-99	290	3
1999-2000	334	44
2000-01	368	34
2001-02	384	16
2002-03	419	35
2003-04	466	47
2004-05	522	56
2005-06	579	57
2006-07	650	71
2007-08	722	72
2008-09	744	22
2009-10	850	106
2010-11	885	35

The trend of incremental traffic is shown below graphically:



From the above it could be seen that there is a consistent and definite trend in incremental traffic from year 2000-01 onwards with the exception of year 2008-09. There is a high degree of correlation (0.996) between GDP and cargo throughput of ports in India. Therefore, cargo traffic projections by regression analysis technique were reckoned using time series data of cargo traffic at ports and GDP at constant prices from 2001-02 to 2010-11. The cargo throughput for the XII plan has been estimated based on the projected GDP growth at 8.5%, 9%, at 9.5% and at 10%.

Table 3 : Projected Traffic during XII Plan				
(in million tonnes)				
YEAR	at 8.5% growth in GDP	at 9% growth in GDP	at 9.5% growth in GDP	at 10% growth in GDP
2012-13	1091	1096	1102	1107
2013-14	1193	1205	1217	1229
2014-15	1303	1323	1342	1363
2015-16	1423	1452	1480	1509
2016-17	1553	1592	1631	1671

B: Elasticity

Elasticity is the proportion of change in one variable in response to the change in another variable. It is a tool for measuring the responsiveness of a variable corresponding to the changes in another variable in a unit-less way. In empirical work elasticity is the estimated coefficient in a linear regression equation where both the dependent variable and the independent variable are in natural logs. Elasticity is a popular tool among empiricists because it is independent of units and thus simplifies data analysis. Elasticity with **GDP** as the independent variable and **total Cargo** as dependent variable considering the time series data from 2001-02 to 2010-11 has been estimated as 1.21252. **This shows that for a 1% increase in GDP at factor cost at constant prices, the total cargo increases by 1.21252% .** Based on the elasticity of 1.21252 the traffic projections have been worked out as follows:

Year	Elasticity	8% GDP growth	9% GDP growth	9.5% GDP growth	10% GDP growth
2011-12	1.21252	970.4	981.1	986.5	991.8
2012-13	1.21252	1064.5	1088.2	1100.1	1112.1
2013-14	1.21252	1167.7	1206.9	1226.8	1246.9
2014-15	1.21252	1281.0	1338.6	1368.1	1398.1
2015-16	1.21252	1405.3	1484.7	1525.7	1567.6
2016-17	1.21252	1541.6	1646.7	1701.4	1757.7

Growth of traffic at individual major ports in relation to the growth in GDP was studied considering the time series data for the past 5 years. Traffic flow at the ports of Kandla, Vizag, JNPT, Chennai, Paradip, Goa, Tuticorin and Kochi have shown strong correlation with GDP while Mumbai has not shown strong correlation. Traffic flows at the ports of Mangalore, Kolkata and Ennore have shown negative correlation. Thus regression analysis and elasticity techniques serve the purpose of estimating the traffic flows at macro level and can only be used as guiding factor. As such, sectoral study has been undertaken for assessing individual port wise and commodity wise traffic forecasts on a realistic basis.

C: End Use Method- Commodity wise Analysis

An analysis of cargo profile of Indian ports reveals that POL, Iron ore, coal and fertilizer constitute about **72%** of the total cargo handled by Indian Ports. A sectoral study covering these commodities has been attempted to assess the cargo traffic during XII Plan.

I. Liquid Cargo - Petroleum & Petroleum Products

Oil and gas continue to play a predominant role in meeting the energy requirements of the country and at present constitute 45 per cent of total energy consumption. The reserves position of crude oil and Natural gas had shown a remarkable growth during the past five years, thanks to the new Exploration Licensing

Policy. As on 01.04.2010, the on shore and offshore reserves position of crude oil and Natural gas are shown in Table 6.

Table 6: Crude Oil and Natural Gas Reserves				
	2005		1st April 2010	
	Crude oil (MMT)	Natural Gas (BCM)	Crude oil (MMT)	Natural Gas (BCM)
On shore	376	340	614	829
Offshore	410	761	587	608
Total	786	1101	1201	1437

Despite this growth, the country's crude oil reserves constitute a meagre 0.67% world crude oil reserves. During the financial year 2010-11, production of crude oil is 37.71 million tonnes compared to 33.69 million tonnes in 2009-10. The installed capacity of the refineries in the country as on Jan. 2011 was 193.4 million tonnes of which public sector accounted for 122.9 million tonnes and balance 70.5 MMT was in private sector (RPL & ESSAR). The refinery crude throughput in 2009-10 was 160 million tonnes. According to petroleum planning and analysis cell, the country imported 159 million tonnes of crude oil during 2009-10 with the remaining supply coming from domestic production. As per the information compiled by Petroleum Planning & Analysis Sector, the capacity of the refineries is likely to increase to 309.9 million tonnes by the terminal year of the XII Plan. Details of the installed capacity, as on 01.01.2011 and additions to refining capacity during 2012-17 are given in the table 7 below:

Table 7: Projected Refining Capacity XII Five Year Plan						
Million Metric Tonnes per Annum						
Company	Installed Capacity as in Jan'11	2012-13	2013-14	2014-15	2015-16	2016-17
PSU	122.8	151.3	154.6	155.4	166.4	196.9
Private	70.5	81.0	86.0	86.0	96.9	113.0
Total	193.3	232.3	240.6	241.4	263.3	309.9

Production of Petroleum Products

The production of petroleum products increased from 119 million tonnes in 2005-06 to 150 million tonnes in 2009-10 as shown in Table 8 .

Table 8: Production of Petroleum Products		
Petroleum Products	2005-06	2009-10
(a) From crude oil	119.8	149.7
(b) From Natural gas (LPG)	2.2	2.2
Total	122.0	151.9

In addition, 6.5 million tonnes of products was imported.

The consumption of Petroleum products increased from 122 million tonnes in 2005-06 to 149.8 million tonnes in 2009-10 including 11.6 million tonnes of Refinery fuel. The production / consumption import /export of petroleum products is given in Table 9.

Table 9 : Production / consumption Import /export of Petroleum Products				
	2009-10 (MMT)			
	Production	Consumption	Import	Export
Crude oil	33.69	193.00	159.3	-
Petroleum Products	151.9	149.7	14.7	50.9

According to the report of Sub-group on processing, transportation and marketing of Petroleum Products and Natural Gas, the production of Petroleum Products is likely to increase to 272.394 million tonnes by 2016-17

Estimation of Demand for Petroleum Products

Demand elasticity of Petroleum Products is declining as shown in the Table 10.

Table 10: Demand elasticity of Petroleum Products					
Particulars	GDP vs. Oil Demand Elasticity				
	VII Plan	VIII Plan	IX Plan	X Plan	XI Plan*
POL Growth (percent)	6.9	6.8	4.9	2.7	3.1
GDP Growth (percent)	6.0	6.8	5.5	7.8	8.2
Demand Elasticity	1.15	1.0	0.89	0.35	0.37

* For years 2007-10

One of the major reasons for declining elasticity is higher contribution of services sector compared to past while contribution from the manufacturing sector has more or less remained the same and it too has improved its efficiency. Year-wise composition of GDP for past few years is given in Table 11.

Year	Agriculture	Industry	Services
1999-91	32.2	21.9	47.8
2000-01	23.9	22.0	54.1
2004-05	20.5	21.9	57.6
2005-06	19.9	26.1	54.0
2009-10	16.9	25.8	57.0

Projected Demand

As per the Sub-group on demand estimates for Petroleum Products for the XII Plan set up by M/o Petroleum, the demand by the terminal year of XII Plan is likely to increase to 189.08 million tonnes representing a CAGR of 5 percent.

Product	2012-13	2013-14	2014-15	2015-16	2016-17	CAGR (%)
LPG	16627	17975	19260	20417	21370	6.9
MS	16186	16854	18054	19519	21283	7.0
Naphtha	12731	11767	11767	11359	11359	-0.2
ATF	6009	6587	7202	7849	8540	9.6
SKO	7949	7631	7326	7033	6751	-4.0
HSD	66000	69300	72765	76403	80223	5.0
LDO	400	400	400	400	400	-0.2

Product	2012-13	2013-14	2014-15	2015-16	2016-17	CAGR (%)
LUBES	2691	2772	2857	2945	3036	3.7
FO/LSHS	8730	8673	8670	8640	8640	-3.5
Bitumen	5500	5800	6000	6250	6400	5.1
PetCoke	10958	14220	14220	14570	14920	20.3
Others	5445	6127	6109	6085	6162	2.4
Total	159226	168106	174630	181470	189084	5.0

Source: M/o Petroleum Sub-Group on Demand estimation for Petroleum Products for XII Plan.

The supply demand scenario during the terminal year of XII Plan is given in Table 13.

Table 13: Supply - Demand Scenario**(2016-17)			TMT
PRODUCT	Total Supply	Total Demand	Supply-Demand Balance
LPG	15665	21370	-5705
Naptha	22812	11359	11453
MS	38784	21283	17501
ATF	15463	8540	6923
SKO	9743	6751	2992
HSD	116951	80223	36728
FO/LSHS	10494	8640	1854
LDO	218	400	-182
LUBES & GREASES	1302	3036	-1734
BITUMEN	5620	6400	-780
OTHERS	35344	21082	14262
Grand Total	272394	189084	83310

Given the present trend of country's production of crude oil it is expected to reach at the most to the level of 41 million tonnes by 2016-17, necessitating import of 269 say 270 million tonnes of crude oil. The product availability by the end of XII plan would be 272 million tonnes thus leaving a exportable surplus of about 83 million tonnes of petroleum products. The transportation of mineral oil from the ports occur by:.

- Imports of crude oil
- Coastal movement of domestic crude (Bombay High, Rawa)
- Export of surplus petroleum products.
- Import of petroleum products to bridge the gap in case of certain products.
- Transshipment of crude oil and petroleum products to address draft limitations at certain ports.
- Movement of petroleum products from one port to another port as a coastal movement

Accordingly, the following scenario is expected to emerge for POL traffic (except LPG & LNG) for Indian ports by 2016-17.

- 270 million tonnes of import crude oil
- 92 million tonnes of export of petroleum products

- 10 million tonnes of crude transshipment and 10 million tonnes of coastal movement of domestic crude
- 9 million tonnes of import products
- 50 million tonnes of coastal movement petroleum products.

Total POL of 430 million tonnes (excluding LNG) by 2016-17 is likely to be channelled through Indian Ports.

LIQUIFIED NATURAL GAS

The indicative reserves of Natural gas as on 01.04.2010 is 829 billion cubic meters on shore and 608 billion cubic meters off shore totalling 1437 billion cubic metres. The production of natural gas (on shore + Off shore) in 2009-10 is 47.5 billion cubic metres. Thus the countries reserves at the present level of production can last for 30 years. In addition, about 2.4 billion cubic meters of gas is imported. Natural Gas is used predominantly by power, fertilizer sector and petro chemical units. The off-take of Natural gas by various industries in 2009-10 is given in Table 14.

Table 14 : Industry wise Off-take of Natural gas (billion cubic metres)		
Industry	2005-06	2009-10
a. Energy purposes		
1) Power Generation	11.9	21.4
2) Captive use, domestic fuel etc	10.1	10.7
Sub-Total	22.0	32.1
b. Non energy purposes		
1) Fertilizer Industry	7.8	13.2
2) Others	1.2	1.9
Sub-Total	9.0	15.1
Grand Total	31.0	47.3

Imports of LNG during the past five years is given in Table 15 :

Table 15: LNG Imports (Million Metric Tonnes)	
Year	Imports
2005-06	5.06
2006-07	6.81
2007-08	8.32
2008-09	8.06
2009-10	8.83

According to India Hydrocarbon vision 2025, the share of gas in India's energy mix would be 20% as against present level of 10% and estimated the demand at 128 mtonne or 142 billion cubic metre (0.9 mtonne = 1 billion cubic metre). Demand scenario for Natural gas by various agencies is summarized in Table 16.

Table 16: Demand Scenario of Natural Gas					
(MMS CMD)					
Year	EIA		IEA (2004)	Hydro cargo vision2005	Power & Energy
	Most likely	Optimistic			
2014-15	124	132	189	329	183
2019-20	155	171	228	358	249
	India Vision		Integrated Research & Action development(2001)		
	BAU (2020)		Moderate	High	
2014-15	149		226	285	
2019-20	194		356	493	

Energy Information Administration – EIA, International Energy Agency - IEA

LNG imports recorded a CAGR of 15% during 2005-10. Import of Natural gas by 2016-17 is projected at 25 MMT under base case (15% CAGR) and 50 MMT 25% CAGR keeping in view under most likely scenario the projected requirement of Natural Gas for envisaged capacity augmentation of gas based fertilizer plants.

II. Dry Bulk

(i) COAL

Coal plays a very important role in India's energy mix, accounting for more than 53 per cent of the total primary energy consumption. The demand for coal has been growing on account of increasing demand from power sector which is the key consuming sector for coal. Steel and cement are the other industries driving the demand for coal in the country. India ranks third in coal production and fourth ranked on the basis of coal reserves. As on 1st April 2010, country's total inventory of coal stood at 276,810 million tonnes of which non coking coal accounts for 88 per cent (243397 million tones) and the remain 12 per cent is coking coal. Of the total reserves,

proven reserves are around 40 per cent and indicated reserves are 47 per cent. Remaining 13 per cent are inferred reserves. Jharkhand has the maximum amount of coal resources followed by Orissa. Other states where large amounts of coal resources are available include Chhattisgarh, West Bengal, Madhya Pradesh and Andhra Pradesh

Raw coal production in the country increased from 313 million tonnes in 2000-01 to 531.6 million tonnes in 2009-10 registering a CAGR of 6.03 per cent. Since domestic production, despite the growth, is unable to cope with the demand, the country is relying on imports and during 2009-10, 81 million tonnes of coal was imported. In order to assess the demand for coking coal and thermal coal, it is imminent to analyze **power sector** and **steel sector** developments. In the succeeding paragraphs, a perspective of these two sectors is presented.

(a) Power Sector

Electricity is the most preferred secondary form of energy and is a vital component for achieving the goals of sustainable development. Therefore, efficient generation and utilization of electricity is one of the top priorities for any country. In 2008, world total electricity production was 20261 terawatt hours, of which 16816 hours was consumed by final users. The world average per capita consumption is 2986 kwh. Canada ranks first in per capita consumption with 18111 kwh followed by USA with 14378 kwh. The per capita consumption in India is only 738 kwh and ranks 23 in the global scenario.. The demand for electricity is projected to increase at an average rate of 7 to 10 per cent per annum. The annual power generation of the country which was a meagre 5 billion units in 1950- 51 increased to 811 billion units in 2010-11. The total installed capacity which was a meagre 1342 mw in 1947, increased to 174912 MW by the end of 31.05.2011. The break up of power generation into Hydro, Nuclear and Thermal may be seen in Table 19.:

Table 19: Installed capacity of power plants(MW)	
Thermal	
▪ Coal	94953
▪ Diesel	1200
▪ Gas	17706
Total Thermal	113859
Wind and renewable energy	18455
Nuclear	4780
Hydro	37817
Grand total	174912

Demand Assessment

TATA Energy Research Institute had estimated the total energy requirement for the country upto 2025 using the following method. Total primary energy consumption estimates including non commercial energy is made on the basis of elasticities w.r.t. GDP. The elasticities are obtained from cross country data as well as time series data of India's energy use. Based on this methodology, the total commercial energy requirement is estimated by TERI as 718 mtoe at 8% GDP growth by 2016-17 and 961 mtoe by 2021-22. The estimated electricity generation required and installed capacity at 8% GDP growth rate is given in Table 20.

Table 20: Estimated Electricity Generation Required and Installed Capacity		
Year	Electricity Generation required (gw)	Installed capacity
2011-12	158274	219992
2016-17	225932	305623
2021-22	322896	424744

Ministry of Power in 2005 has made certain estimates for electricity requirement and installed capacity are given in Table 21.

Table 21: Electricity Requirement		
	Billion KWH	Installed Capacity
2011-12	1029	206440
2016-17	1511	303330
2021-22	2221	445690

Source: Coal vision 2025

It may be seen that the projections arrived by TERI is not very far from the projection made by the Ministry of Power. The above requirement can be met by various alternative viz. coal, nuclear, Hydro, gas, oil and renewable sources. One possible scenario, developed by TERI for modal split of electricity generation envisages 78% for thermal energy. To achieve the above thermal energy, fuel needs were projected in table 22.

Table 22 : Fuel Requirement (MMT)			
	2011-12	2016-17	2021-22
Coal	493	656	814
LNG	25	41	58
Oil	8	9	12

Coal Production in India

. As per the mid-term appraisal by the Planning Commission, the indigenous production of coal during 2011-12 is estimated to reach 630 MT and demand for 2011-12 is assessed as 715 MT. According to CRISIL the country's supply would increase nearly to 1100 MT by XII Plan against the demand of 1400 million tonnes leaving a gap of 300 MT between demand and supply. Given the estimated gap, alternative sources are being explored by several companies. CIL, the leading coal producer of the country has been making efforts to acquire coal resources and develop coal projects in Australia, Indonesia, South Africa and USA and the coal produced from these properties would be used to meet domestic coal demand. Over all the country is expected to continue witnessing a surge in imported coal in the XII plan.

An analysis of coal consumption by major consuming sectors reveals that power sector accounts about 80% of coal off-take, 4% by steel sector 3 to 4% by cement sector about 1% by fertilizer plants and balance by bricks, kilns, textiles, chemicals etc. The shortage in allocation of domestic coal along with the poor coal quality has resulted in cement company resorting to imported coal or going for open market purchase or

using alternative fuels such as regrite. Import of coal has shown a rising trend during the last few years. As far as steel industry is concerned non coking coal or natural gas is used for direct reduction process whereas coking coal is used for blast furnace based steel plants.

Coal Imports

India's coal imports have recorded substantial growth between 2004-05 and 2009-10 from about 29 million tonnes to 81 million tonnes. During this period, imports grew at a CAGR of around 23 per cent. Total imports of hard coal accounted for over 13 per cent of domestic consumption in 2009-10 as against 7.1% in 2004-05. The import of steam coal has been increasing at a faster pace due to two reasons, the rapid growth in demand and the inferior quality coal produced in India. Further, power plant operators particularly in the coastal regions of western and southern India prefer imported coal mainly to overcome the logistical challenges associated with transporting coal over large distances over already heavily congested rail network. Thermal coal imports are competitive with domestic coal in coastal locations which are located far from domestic coal sources. The coal being imported has a gross calorific value (GCV) of around 4,750-6800 kCal / kg compared to the GCV of domestic coal of around 3,755 kCa/kg.

According to the prevailing import policy, coal can be freely imported under open general license by consumers. The customs duty on coking coal is currently zero while that on non-coking coal is 5 per cent since 2005-06. The key import sources are Indonesia, Australia and South Africa which together accounted for about 95 per cent of the total imports. New import sources are being explored by Indian coal consumers. According to reports in March 2010, for the first time there are indicators of shipping excess coal from the Netherlands stockpiles to India.

Coal Demand Vs. Availability Scenario

According to the estimates prepared by Central Electricity Authority (CEA) in August 2011. Coal requirement by the end of 12th Plan by power sector would be 842 million tonnes as against likely availability of 550 million tonnes leaving a shortfall of 292 million tonnes. According to CEA, **coal likely to be imported for Thermal Power Stations (TPS) designed on Indigenous coal would be 161 million tonnes and coal to be imported by TPS designed on Imported Coal is expected at 50 million tonnes making the total imports of 211 million tonnes of non-coking coal, which is 25% of the total coal requirements during the end of 12th five year plan period.** In addition to this, about 38 million tonnes of indigenous coal is expected to be transported through sea route. Thus, the total non coking coal traffic for power sector including coastal movement would be 287 million tonnes (161 MT + 50 MT + 38 MT + 38 MT) say 290 million tonnes by the end of XII Five Year Plan. Out of 161 million tonnes to be imported by TPS on indigenous coal, 64 million tonnes is expected through Eastern Ports and 97 million tonnes would be through Western Ports. The year-wise Coal requirement Vs. availability scenario as projected by CEA, Coal is given in Table 23.

Table 23 : Coal Demand Vs Availability Scenario					
(Million Tonnes)					
	2012-13	2013-14	2014-15	2015-16	2016-17
Coal requirement (MT)	515	572	650	737	842
Coal Availability					
i) Likely availability of Indigenous coal	416	436	471	521	550
ii) Coal to be imported by TPSs designed on imported coal	32	40	47	49	50
Shortfall	67	96	132	167	242
Coal likely to be imported for TPSs designed on indigenous coal	45	64	88	111	161
Coal likely to be carried through Eastern Port	18	26	35	44	64

Coal likely to be carried through Western Port	27	38	53	67	97
Indigenous Coal expected to be transported through sea-route	22	38	38	38	38
Note: In addition to above 38 MT indigenous coal is expected to be transported through sea-route. Out of 38 MT, around 2 MT coal would be transported through Haldia Port and around 36 MT coal is expected to be transported through Pradeep/Vizag Port.					

The capacity of the steel industry is likely to increase to 142 million tonnes. Based on this, the non coking coal requirement for the steel industry would be of the order of about 30 to 36 million tonnes. In addition, about 5 to 10 million tonnes non coking coal imports is estimated for cement industry and other industries. Accordingly, the non coking coal projections is reckoned as 325 (290 + 30 + 5) say 325 under base case and 336 (290 + 36 +10) million tonnes under optimistic case(**out of which 25% of total coal requirement will be through import**).

(b) Steel

India is the fifth largest steel maker in the world with China as the leader followed by Japan, US and Russia. The Steel Industry is another key consumer of coal in the country. This sector uses coking coal as a major input for the production while non-coking coal is used for both production and captive power requirement. Coking coal is used as a raw material for Blast Furnace based Steel Plants while non coking coal or natural gas is used for direct reduction process. The consumption of the Steel stood at 65.6 MT in 2010-11 and has grown at a rate of 9 to 13% during the past five years. The production of steel increased from 41.4 million tonnes in 2004-05 to 66.8 million tonnes during 2010-11. Despite the growth, per capita steel consumption is 53 Kg as against 320-370 Kgs of consumption in developed economies. Given this scenario, India has a huge potential for additional steel consumption.

National Steel Policy (2005)

The National Steel Policy (2005) envisages the following targets for production and consumption of Steel by 2019-20

(in million tonnes)

	Production	Consumption	Import	Export
2019-20	110	90	6	26

According to 70th OECD Steel Committee meet held at PARIS, steel demand is expected to continue @ 10% + CAGR till 2020. While steel demand is driven by anticipated growth in GDP which aims at 9 to 9.5% during XII Plan, the Government's commitment to spend about \$ 500 billion in next few years on Infrastructure Building also is likely to act as a catalyst for increasing the demand. At 9% GDP growth, steel demand is likely to touch 113 million tonnes by 2016-17 and 124 million tonnes at 9.5%. In other words, the target of 100 MT set by National Steel Policy by 2019-20 is likely to be exceeded by 2016-17 itself. The capacity of the steel industry is 78 million tonnes and is likely to reach 110-120 MT by 2012 and 300 million tonnes by 2020, according to OECD estimate (12% CAGR). National Steel Policy (2005), projected a consumption growth of 6.9% where as actual consumption growth during past five years is 9.4% and consumption growth estimated to exceed 10% in the next decade. The policy imperatives which are conducive to capacity building of Indian Steel Industry are:

- Import duty at 5%
- 100% Foreign Investment allowed through automatic route even in Ministry Sector
- Large infrastructure projects on PPP mode
- Demand booster from housing
- Automobile and consumer good.
- Encouraging beneficiation method for utilization of low grade iron ore.

With the above policy framework in place, India may emerge as world's third largest producer by 2014.

Sub-group for XII Plan of the Ministry of Steel

The Sub-group has adopted the following assumptions:

- 1) Growth in steel consumption during 2011-12 has been assumed at 7%
- 2) In order to select the base case for demand estimate for 12th Plan, the implied rates of growth in steel consumption under the four scenarios by taking GDP as explanatory variable has been adopted as shown in Table 24.

		Growth in GDP	Implied Growth
1.	Scenario-I	8.0%	9.1%
2.	Scenario-II	8.5%	9.7%
3.	Scenario-III	9.0%	10.3%
4.	Scenario-IV	9.5%	10.8%

The Sub Group felt that projections based on GDP elasticity may be adopted as

- 1) Longer Time Series is available for analysis
- 2) Elasticity base on short term series (1.14) matches with that obtained through Longer series (1991-92 to 2010-11)
- 3) GDP reflects overall economic activity including that of agriculture and services sector, while GFCF and IIP do not capture important trends in value addition of some of the important sectors.

Total Steel Demand and Required Level of Finished Steel Production

The World Steel Association, which has been monitoring production, consumption, etc of steel industry in each country since 1980's, is also projecting short-range outlook for steel. These projections are inclusive of demand for alloys and stainless steel. A look at the data system provided by Joint Plant Committee (JPC) of M/o Steel shows that the consumption of alloys and stainless steel has been hovering between 3 – 3.5mt over the past few years. For projecting demand in the next 5 years time, the Sub-Group decided to add 5 mt of alloys and stainless steel (in a progressive manner) to the demand for finished carbon steel. Accordingly, based on projected growth of 10.3% in carbon steel consumption, the total demand of finished steel in the country including an export demand of 7 million tonnes (net export of 2.0 MMT) by end of 12th Plan or 2016-17 would be as given in the Table 25.

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Domestic Demand for Carbon Steel	66.5	73.3	80.8	89.1	98.3	108.3
Domestic Demand for alloy steel	3.50	4.00	4.25	4.50	4.75	5.00
Total Domestic Demand for Steel	70.0	77.3	85.05	93.6	103.05	113.3
Imports	7.0	6.0	5.5	5.5	5.0	5.0
Exports	3.3	4.0	5.0	6.0	7.0	7.0
Net Exports	(-)3.7	(-) 2.0	(-) 0.5	0.5	2.0	2.0
Production net of double counting	66.3	75.3	84.6	94.1	105.1	115.3

Requirement of Crude Steel Production and Crude Steel Capacity to meet domestic and export demand of finished steel during 12th Plan.

Based on a conversion rate of 90% from crude steel to finished steel and an average capacity utilization rate of 90%, the total installed steel capacity for 12th Plan (year-wise) would be as given Table 26.

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Production of finished steel	66.3	75.3	84.6	94.1	105.1	115.3
Production of Crude Steel	73.7	83.7	94.0	104.6	116.8	128.1
Crude Steel Capacity	81.9	93.0	104.4	116.2	129.8	142.3

As per JPC data, the total installed capacity for crude steel in the country was 78 million tonnes during 2011 and therefore the incremental capacity required by the terminal year of 12th plan (i.e. by 2016-17) is 64.3 million tonnes implying an annual average increase of 10.7 million tonnes.

Coking coal

Coking coal is used as a raw material for Blast Furnace based Steel Plants while non-coking coal or natural gas is used for Direct Reduction Process. During 2010-11, 33 million tonnes of coking coal is imported through the country to cater to steel industry. Owing to poor quality of domestic prime coking coal, the industry is blending the same with imported coal and relying mostly on imports. National Steel Policy estimated 70 MT of coking coal for Steel Industry by 2019-20 to produce 110 MT of Steel and 26 MT of non coking coal apart from 190 MT of Iron ore. The projected requirements are based on the assumption that new capacities will be 60 per cent through the Blast Furnace Route, 33 per cent through sponge iron – Electric Arc Furnace Route and 7 per cent through other routes. The demand for coking and non-coking coal worked out by the Sub-group of M/o Steel is given in Table 27.

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total Coking Coal Demand*	44.4	52.5	59.2	69.7	80.7	94.2
Total Non-Coking Coal Demand for Iron & Steel making	36.6	38.0	37.6	36.4	36.2	30.3

* - Total coking coal demand includes those for merchant pig iron units as well.

There is no estimate on the domestic availability of washed coking coal within the country. Roughly, it is expected that **out of total 113 million tonnes of coking coal requirements, domestic supplies of coking coal to be about 10 million tonnes annually over the plan period and rest 103 million tonnes through imports, which is around 91% of the total coal requirement of the steel plants.** The balance will have to be imported. In order to produce one tonne of steel, 0.64 tonne of coking coal is required as per National Steel Policy. However, industry experts projected a requirement of 0.80 tonne of coking coal to produce 1 tonne of steel. Accordingly, demand projection for coking coal in 2016-17 is summarized in Table 28.

Table 28 : Demand projection for coking coal in 2016-17 (Million Tonnes)		
	Base case	Optimistic
Projected Capacity of Steel Industries by 2016-17	142	142
Coking coal requirement	94.2	113
Coking coal imports by 2016-17	84.2	103

(ii) Iron Ore

Current estimate of India's national Iron ore inventory stands at approximately 25 billion tonnes of resources (IBM year Book 2009), primarily distributed in the five states of Jharkhand, Orissa & Chhatisgarh in the eastern region and Karnataka & Goa in the western region. Out of this, about 7 Billion tonne are proven reserve, and balance 18 billion tonnes are resources comprising of 7.6 billion tones of Hematite ore and 10.6 Billion tons of Magnetite ore resources. The Magnetite reserves are confined to ecologically sensitive western hill range in the states of Karnataka and Goa. Due to these reasons the steel industry so far have not been able to take full advantage of this large reserve of Magnetite ore.

Iron ore Supply

Production of iron ore which was about 172 million tonnes at the end of X Plan increased to 226 million tonnes in 2009-10. The production of iron ore from 2004-05 onwards is given in Table 32.

Table 32 : Production of Iron Ore (Million tonnes)			
Financial Year	Production	Domestic Consumption	Exports
2004-05	145.94	48.15	78.14
2005-06	154.43	52.23	89.27
2006-07	172.30	56.28	93.79
2007-08	206.94	81.20	104.00
2008-09	210.00	90.00	105.87
2009-10	226.00	102.00	117.00

Of the total iron ore production of 226 million tonnes in 2010, the share of fines and lumps was 55 percent and 45 per cent respectively. But, due to adequate availability of high-grade ore (lumps with more than 63 per cent of Fe content), the domestic steel industry does not prefer fines. The breakup of production of iron ore into Lump, Fine and concentrates is given in Table 33.

Table 33 : Breakup of Iron Ore Production		
(Million tonnes)		
	2006-07	2009-10
Iron ore	187.7	226.0
Lumps	88.3	100.0
Fines	98.2	125.0
Concentrate	1.1	1.0

Source : Ministry of Mines

Miners, therefore, have no other than option to export in order to continue excavation activity. Export of fines have enabled iron ore miners to supply lumps to electric arc furnace and sponge iron units that do not have their own captive mines. About 91 percent of total iron ore exports in 2009 were in the form of fines of which 46% accounted for FE content with more than 62% and 45% less than 62%. The consumption of low grade iron ore fines in India is likely to double in 3 years owing to substantial increase in consumption by existing and proposed steel plants. India had four pelletisation plants, with a total capacity of 18 million tonnes, by the end of March 2010. This is forecast to increase to 30 million tonnes by March 2012 and further to 51.7 million tonnes by the end of 2015. Major capacity additions are likely by Essar Steel, Jindal Steel and Power, Ispat Industries and NMDC. Total iron ore fines consumed by steel units in 2009 stood at 18.9 million tonnes.

Prevailing uncertainties in Iron ore Trade

- Non predictable / stable government policy on export of iron ore which is a non – renewable and critical natural resource for steel and alloys production.
- High export duty from March 2011. (from 5% to 20%)
- Crack down on illegal mining activity in states / provinces like Karnataka and Orissa.

- Year long ban by Karnataka government, which problem still is lingering and not yet solved.
- Tightening up iron ore export norms and rules by Orissa Government.
- Increase in railway freight rates
- Some of the state governments are considering total ban on iron ore exports to conserve this non – renewable resource.

Anticipated Demand

India's projected requirement of iron ore for the steel industry to cater to the projected capacity expansion to 194 to 211 million tonnes of crude steel by 2016-17 is around 320 to 348 million tonnes (1.65 Tonne for 1 tonne HM). The present production capacity for iron ore is only about 200 million tonnes. Mines operators are gearing themselves either to enhance production from the existing mines and / or opening up new mines. Currently there are 577 iron ore mining leases granted and some 300+ mines are in operation. Around 100 mines are operated by major companies contributing 50% of the total production and balance come from small mines. Prevailing mining technology has been conventional. Though iron ore exists in abundance in India it is not easy to acquire a lease and commence production. A mining lease application passes through around 10 agencies for 7-8 years. With the ushering of larger mines the country can go for large scale technological intervention.

Steel companies who do not have captive mines or have small holdings not adequate for the production/expansion, are going for acquisition of Iron ore mines. This trend has gained momentum especially in the last few years as it has become clear that only those steel producers who have captive mines will be competitive in the long run. With future expansions in the steel industry in India there are two schools of thought which say India could either continue to be an exporter of iron ore or be a sole consumer of its own resources of iron ore. At this juncture it is entirely dependent on the government decisions on whether to allow exports or preserve iron ore for the future growing steel industry.

The world is presently observing India as iron ore exports have created a benchmark in the global iron ore trade to China. India may not continue to be a leading iron ore exporter with its domestic consumptions rising. China may have to depend on Australia and South American for its iron ore, and the day is not far when India will join China as a buyer from Australia or South America, if India's consumption to turn into another steel hub materializes. However this is not likely to happen in XII Plan.

Iron Ore Exports

The all India exports of iron ore in 2009-10 is given in Table 34.

Country	2009-10
China	109.3
Japan	5.9
South Korea	1.3
Europe	0.7
Others	0.2
Total	117.4

Source: FIMI Bulletin

Exports of iron ore in 2010-11 was 104 million tonnes and is likely to fall to 75 million tonnes in the year 2011-12.

Iron ore traffic

During 2009-10 iron ore loaded through major ports (including pallets and coastal traffic) was 98.2 million tonnes which decreased to 87 million tonnes in 2010-11 mainly due to restrictions imposed on mining of Bellary, Hospet and Goan iron ore. In addition about 49 million tonnes of traffic of iron ore was handled at non- major ports which decreased to 42.50 million tonnes in 2010-11. Thus the total traffic through Indian Ports in 2009-10 was 147 million tonnes of which 117 million tonnes were overseas export. The exportable surplus of Bellary – Hospet Iron ore after meeting the domestic requirement of existing and upcoming steel plants of the state is estimated at 32 to 39 million tonnes by 2016-17. The estimated exportable surplus of Karnataka region is 42 to 49 million by 2016-17 as against the existing surplus of 27 million tonnes.

Given the uncertainties in the iron ore trade particularly Bellary, Hospet and Goan iron ore it is rather difficult to arrive at realistic estimate for iron ore. Further, the increasing domestic demand consequent on increasing steel capacity is also required to be kept in view while estimating the traffic. However, the exports of fines ore with Fe content less than 62% which is not fully used by domestic industry is likely to continue in the XII Plan i.e. up to 2016-17. This optimism emanates from the recent trends observed in China's intake of iron ore which shows China may depend on iron ore imports, though in reduced scale, for the next five years. Further, the construction programmes of China viz. 36 million units of i) affordable housing, ii) 30,000 Kms of Railway line in next 3 years and iii) developments in road transport industry are pointers for the continuance of iron ore imports by China. It is also likely that India may not impose 100% ban on iron ore exports, given the surplus position of low grade fines ore and country's less dependence on the same. Accordingly, it is assumed that the exports of low grade fines ore (less than 62% Fe) will increase at 3 to 5% per annum through 2016 as the country's steel plants are preferring Lump ore. Exports of high grade fines ore and lump ore may either remain stagnant to honour the short term contracts with countries like Japan or decrease by 20%. Further, there would be 15% coastal movement of ore through the ports. The Iron ore traffic through ports of India is likely to be of the order of 120 million tonnes under base case and 140 million under optimistic by 2016-17.

In addition, there would be additional movement of 30 million tonnes of pellets traffic in 2012-13 which is likely to increase to 51 million tonnes by 2016-17. However, expansion of pelletization plant capacity is capital intensive. It is learnt from the industry that a million tonne of pellet plant requires Rs. 220 crore investment. As such, about 30 million tonnes is reckoned for pellet traffic under base case and 50 million tonnes under optimistic scenario by 2016-17 making the total iron ore and pellet traffic as 150 and 190 million tonnes.

(iii) Fertilisers

India is one of the largest producer of fertilizers in the world and is the second largest consumer of fertilizers after China. Fertilizer consumption in India has been increasing over the years and in 2009-10 it stood at 26.419 million nutrient tonnes. The fertilizer consumption in India has generally exceeded domestic production in nitrogenous and phosphatic fertilizers. The entire requirement for potassic fertilizers is met through imports. With the introduction of the high yielding varieties of wheat and rice, the fertilizer imports increased significantly in the last decade. Despite this, the consumption of fertilizer per hectare of arable land was only 135 kgs as against 331 kgs in China, (2007) 190 Kgs in Brazil and 171 Kgs in USA and 191 Kgs/hectare in Bangladesh. In the wake of limited scope for increasing arable area and with the raising population levels, the application of essential plant nutrients is the key to increase crop production. The study of share of primary nutrients i.e. Nitrogen (N), Phosphorous (P) and potassium (K) imbalance in use of primary nutrient with rise in share of N and decline in share of P and K during early 2000. In order to obviate this, government hiked the concession rates for P and K fertilizers. Last six years have seen significant recovery in fertilizers use in the country and total consumption reached a record level of 26.5 millions in 2009-10. The imports of fertilizers during 2010-11 through major and non major ports was 19.2 million tonnes.

Demand Forecast

The projected demand for fertilizer products estimated by Indian Institute of management, in a research paper titled “**Demand for Fertilizer in India**” given in Table 35.

Table 35: Fertiliser Demand						
(In Million tonnes)						
	2012-13	2013-14	2014-15	2015-16	2016-17 *	2020-21
Urea (N)	31.3	32.6	33.8	34.8	35.8	40.3
DAP	11.5	12.1	12.6	13.1	13.6	15.8
SSP (P)	3.4	4	4.1	4.3	4.5	5.2
MOP (K)	5.4	5.7	6.1	6.4	6.7	8.3
Complex	10	10.4	10.9	11.4	11.9	13.6

fertilizer						
Total	61.6	64.8	67.5	70	72.5	83.2

* Interpolated by the sub-group.

Demand estimate by Fertilizer Association of India(FAI)

FAI, vide latest forecast for fertilizers, which varies slightly from the estimates made by IIM. The projections for fertilizer demand estimated by FAI are given in Table 36.

Table 36: Fertiliser Demand Estimates by FAI					
(In Million Tonnes)					
	Demand				
	2012-13	2013-14	2014-15	2015-16	2016-17
Urea	30.35	31.19	32.03	32.86	33.68
DAP	11.56	11.78	12.00	12.21	12.41
SSP	4.29	4.68	5.09	5.51	5.95
NP/NPK	10.29	10.58	10.86	11.14	11.42
MOP	6.21	6.39	6.56	6.73	6.89
Others	0.95	0.98	0.98	1.00	1.00
Total	63.65	65.60	67.52	69.45	71.35

It is seen from the above that for the terminal year of XII Plan, difference in the two sets of estimates is only 1.2 million tonnes

Fertilizer Production

The capacity of fertilizer plants in India stood at 45.548 million tonnes as on 31.03.2011. The production of fertilizers in 2010-11 was 38.5 million tonnes. In addition, supply from joint ventures abroad i.e OMAN India Fertilizer Company (OMIFCO) is about 1.65 million tonnes of urea per annum.

With the planned capacity addition, the I fertilizer supply through the existing and proposed plants is estimated at 53.7 million tonnes. The domestic fertilizer availability during XII Plan is given in Table 37.

Table 37: Domestic Fertilizer Availability					
(In Million tonnes)					
	2012-13	2013-14	2014-15	2015-16	2016-17
Urea	24.20	25.47	26.74	27.90	30.56
DAP	4.42	4.51	4.60	4.69	4.78
SSP	4.29	4.68	5.09	5.51	5.95
NP/NPKs	9.23	9.87	10.56	11.14	11.42
Others	0.95	0.98	0.98	1.00	1.00
Total	43.09	45.51	47.97	50.24	53.71

Imports of Fertilizers

Imports of fertilizers including imports from JV – Year on Year (Demand – Supply gap) as per Fertilizer Association of India including supply from JV is given in Table 38.

Table 38 : Estimated imports during XII Plan	
(MMT)	
Year	Base case
2012-13	22.56
2013-14	20.09
2014-15	19.55
2015-16	19.21
2016-17	17.64

The above projection pre-suppose that urea capacity planned will be in place. However, it is to be noted that these projects are mainly dependent on availability of gas and it is likely that all projects may not materialize as planned. Any delay in capacity addition would result in additional imports to the extent of shortfall in capacity addition.

Fertilizer Raw Material

During 2010-11, 7.62 million tonnes of fertilizers raw materials was handled at Indian ports which include 1.34 million tonnes of sulphur, 4.9 million tonnes of liquid ammonia and phosphoric acid (liquid fertilizer raw materials) was handled at Indian ports. The Capacity additions planned during XII plan are predominantly gas based. The demand for fertilizer raw material during XII Plan, as per FAI are given in Table 39.

Table 39 : Demand for Fertilizer Raw Material					
(In Million tonnes)					
Year	2012-13	2013-14	2014-15	2015-16	2016-17
Fertilizer Raw Material (DRY)					
Rock Phosphate	6.72	7.09	7.48	7.86	8.26
Sulphur	2.24	2.35	2.47	2.58	2.70
Fertilizer Raw Material (LIQUID)					
Ammonia	16.10	16.84	17.57	18.24	19.75
Phosphoric acid	4.00	4.10	4.20	4.30	4.40

Indigenous supply and imports of Fertilizer Raw Material estimated by FAI during the XII Plan is given in Table 40 & 41 below.

Table 40: Fertilizer Raw Material Supply					
(In Million tonnes)					
Year	2012-13	2013-14	2014-15	2015-16	2016-17
Fertilizer Raw Material (DRY)					
Rock Phosphate	1.65	1.65	1.65	1.65	1.65
Sulphur	0.90	1.00	1.05	1.10	1.15
Fertilizer Raw Material (LIQUID)					
Ammonia	14.13	14.84	15.55	16.19	17.68
Phosphoric acid	1.40	1.50	1.60	1.70	1.80

Table 41: Fertilizer Raw Material Import					
(In Million tonnes)					
Year	2012-13	2013-14	2014-15	2015-16	2016-17
Fertilizer Raw Material (DRY)					
Rock Phosphate	5.07	5.44	5.83	6.21	6.61
Sulphur	1.34	1.35	1.42	1.48	1.55
Total FRM Dry	6.41	6.79	7.25	7.69	8.16
Fertilizer Raw Material (LIQUID)					
Ammonia	1.98	2.00	2.03	2.05	2.08
Phosphoric acid	2.60	2.60	2.60	2.60	2.60
Total FRM Liquid	4.58	4.60	4.63	4.65	4.68

III. Containerized Cargo

Container traffic growth has picked up strongly since 2000 and has grown at 1.8 times multiple of GDP growth during the past decade (2000-10) in case of major ports and about 3 times in respect of non major ports. The CAGR of International trade is

19.35%. Table 43 gives growth in GDP and Container cargo in major and Non-major ports.

Table 43: Growth in Container Trade			
	2000-01	2009-10	CAGR (%)
GDP (Billion Rs.)	18643	36190	7.65
Container Traffic (Million tonnes)			
• Major Ports	322	101.24	13.6
• Non Major Ports	7.87*	14.85	23.5

* 2006-07 Source: EIU

During 2009-10, 116.09 million tonnes of container traffic 7.2 million TEUs was handled through Indian Ports (including non major ports) constituting 13.6% total traffic handled as against the share of 10.4% in 2002-03. During 2010-11 the traffic increased to 132 million tonnes (8.8 MTEUs) Major Ports handled 114 million tonnes (7.5 MTEUs) posting an increase of 9% over 6.9 million TEU handled in 2009-10 and Non Major Ports handled 1.2 MTEUs as against 1.01 MTEU in 2009-10. Container traffic at Indian Ports increased at CAGR of 13.5% during 2000-01 to 2010-11. Despite best efforts by the Government, the level of containerization of general cargo still remained at about 52% far less than the level of 70% to 80% recorded in developed economies.

Regional Trends in Container Trade

An analysis of directional distribution depicts an imbalance in the share of East Coast and West Coast Ports in respect of container trade is given in Table 44. West Coast ports handled 63% of the total container trade in 2010-11 while East Coast share was 37% as detailed in the Table : . However, it is pertinent to note that share of East Coast Port posted an increase from 32% in 2005-06 to 37.4% in 2010-11 mainly due to development of facilities at Chennai Port.

Table 44 : INDIA's CONTAINER TRAFFIC – PAST TRENDS					
(In Million tonnes)					
Name of the Port	2000-2001	2005-06	2009-10	2010-11	CAGR (%)
Kolkata	2.01 (0.14)	3.23 (0.20)	6.64 (0.38)	6.22 (0.38)	10.5
Haldia	0.80 (0.05)	1.91 (0.11)	2.07 (0.12)	2.76 (0.15)	11.6

Paradip	0.01	0.05 (Neg)	0.04 (Neg)	0.06 (Neg)	--
Visakhapatnam	0.28 (0.02)	0.63 (0.05)	1.68 (0.10)	2.57 (0.15)	22
Chennai	5.77 (0.35)	11.76 (0.73)	23.48 (1.22)	29.42 (1.52)	15.8
Tuticorin	1.57 (0.16)	3.43 (0.32)	6.60 (0.44)	8.17 (0.47)	11.4
Ennore	--	--	--	--	
Krishnapatnam	--	--	--	--	
Total East Coast Share	10.44 (0.72) 32.40	21.01 (1.41) 31.78	40.51 (2.26) 34.90	49.20 (2.67) 37.41	14
Kochi	1.79 (0.15)	2.49 (0.20)	3.93 (0.29)	4.42 (0.31)	7.5
New Mangalore	0.02 (Neg)	0.15 (0.01)	0.48 (0.03)	0.57 (0.04)	23
Mormugoa	0.04 (Neg)	0.10 (Neg)	0.19 (0.01)	0.18 (0.02)	--
Mumbai	4.36 (0.32)	2.14 (0.16)	0.61 (0.06)	0.65 (0.07)	-14
JNPT	14.28 (1.19)	33.78 (2.69)	53.10 (4.09)	56.43 (4.27)	13.6
Kandla	1.29 (0.09)	2.31 (0.15)	2.43 (0.15)	2.59 (0.16)	5.9
Mundra % Pipavav		4.13 (0.33)	14.85 (1.19)	17.56 (1.24)	26.7
Total West Coast Share	21.78 (1.75) 67.60	45.10 (3.59) 68.22	75.58 (5.66) 65.10	82.30 (6.11) 62.6	13.3
TOTAL	32.22 (2.47)	66.11 (5.00)	116.09(7.92)	131.50(8.78)	13.5

Figures in parenthesis indicates MTEUs

Source : (1) Major Ports of India Profile 2001-02, 2009-10

(2) Update on Port Statistics, Transport Research Wing, M/o Shipping.

While container traffic has grown across the country, the growth has not been uniform. The bulk of the demand originates in the north –western hinterland which accounts for close to 70 per cent of the container cargo in the country. The western ports catering to this vast hinterland have experienced a container traffic growth rate of 13.31 percent between 2000-01 and 2010-11 and handled roughly 82.3 million tonnes in 2010-11. The Jawaharlal Nehru Port (JNP) near Mumbai alone accounted for over 48 percent of the containers handled in the country. The Southern hinterland is the next largest, accounting for roughly 22 percent of the container demand, and traffic there grew at an average of 14.6 percent p.a. during 2001-10 whereas the combined growth of East Coast ports was 14 percent. Although major cargo centres in the hinterland are almost equidistant from available ports in the East Coast and the West Coast, the

majority of the cargo flows to West Coast mainly due to the following reasons. In terms of nautical miles, the over all deviation, from the main shipping route on the backward leg of Far East - Europe leg, is minimal for West Coast than that for East Coast.

Container Traffic Forecast

The growth of container traffic would be driven by :

- (i) International trade growth & National GDP growth.
- (ii) Penetration of containerization
- (iii) Hub and feeder service structure

(i) International Trade Growth

India's export earnings in 2008-09 topped US \$ 185 billion, and import value in 2008-09 reached US \$ 304 billion. There was a marginal decline in foreign trade in 2009-10 owing to global economic crisis. However, the same has been estimated at US \$ 225 billion in 2010-11. In 2009-10 India's export earnings constituted 23% of GDP as against 14% in 2005-06 and 10% in 2001-02. Table 45 gives the growth of India's imports and exports with respect to national GDP.

YEAR	National GDP @		Exports		Imports		Total Foreign Trade
	(Rs. In billions)	Growth (%)	US \$b	Growth (%)	US \$b	Growth (%)	
2000-01	18640	4.4	44.6	20.1	50.5	0.5	95.1
2001-02	19730	4.8	43.8	-1.8	51.4	1.8	95.20
2002-03	20480	3.8	52.8	20.5	61.4	19.5	114.20
2003-04	22230	8.5	63.8	20.8	78.2	27.4	142.00
2004-05	23890	7.5	83.5	30.9	111.5	42.6	195.00
2005-06	26160	9.5	103.1	23.5	149.2	33.8	252.30
2006-07	28710	9.6	126.4	22.6	185.7	24.5	312.11
2007-08	31380	9	163.1	29	251.7	35.5	414.80
2008-09	33510	6.7	185.3	13.6	303.7	20.7	489.00
2009-10	36190	7.9	178.8	-3.5	288.4	-5	467.2
CAGR		7.65		16.69		21.35	19.35

@ 1999-00 Series

While trade was growing at about 20% per annum, its impact on container traffic growth could be higher, since a greater share of trade is moving towards finished goods requiring containerization. Encouraged by the robust export / import growth, the

Department of Commerce had set a target of achieving a trade figure of US \$ 450 billion by 2013-14 and then to US \$ 750 billion by 2016-17. The anticipated surge in International trade will provide a fillip to container trade through Indian Ports. Container traffic has been shown to exhibit a strong linkage to GDP growth and most developing countries have demonstrated a high level of correlation between the two. As the economy expands, and both manufacturing output and purchasing power increases, imports and exports of intermediate and finished goods, which are typically containerized, would increase.

The countries exhibiting growth in external trade predominantly textiles, automotive, auto ancillary and engineering goods have augmented the container trade and India is likely to follow the same trend. Higher industrial output will increase the imports of raw materials and exports of finished goods. Engineering goods, electronic goods, auto ancillary equipment, textiles, and machinery which are amenable for containerization are likely to experience higher growth in the near future. The CAGR recorded by Engineering goods & Textiles during 2005-10 is presented in Table 46.

Table 46: Value of Exports (US \$ million) for Manufacture Sector (Major Items)					
Manufacturer	2005-06	2007-08	2008-09	2009-10	CAGR
Engg .Goods (Machinery, Transport Equipment including steel & Iron)	21315	37220	47155	38171	15.7
Textiles & Garments	12515	14340	15052	14392	3.6
Chemical & Products	11935	17371	22711	22911	17.7

Source: Economic Survey 2006-07, 2009-10, 2010-11

Further, the Multi Fibre agreement is expected to result in 25% growth in Textiles. The high growth registered by auto mobile industry is definite to continue. As per the survey conducted by CII, the fast moving consumer goods sector is poised to grow at 13% per annum. These products include edible oils, papers boards, Pharmaceutical products, electrical & electronic items, machinery, wrist watches, diary based products, beverages, oral care, household care etc. Growth in International

logistics and improved infrastructure in the recent past will act as a catalyst to boost container trade.

GDP growth has traditionally been used to forecast container traffic growth. Calculations for container trade growth have included formulations such as 2 to 3 times the GDP growth rate or 10 percent plus the GDP growth rate. The table 47 presents the Indian GDP and its counterpart volume of container trade. The close relationship between GDP and container volume has led industry forecasts to expect high growth in container traffic over the next decade.

YEAR	National GDP (Billion Rs.)	Total Traffic MillionT onne	Major Ports Million Tonne	Non-Major Ports Million Tonne	Major Ports (Containers)		Non-Major Ports (Containers)		Total (Containers)	
					MillionT onne	000 TEU'S	MillionT onne	000 TEU'S	Million Tonne	000 TEU'S
2000-01	18643	368	281	87	32	2468	--	--	32.0	2468.0
2001-02	19726	384	288	96	37	2886	--	--	37.0	2886.0
2002-03	20483	419	314	105	44	3366	--	--	44.0	3366.0
2003-04	22227	466	345	121	51	3900	-	--	51.0	3900.0
2004-05	23888	522	384	138	55	4233	0.2	15	55.0	4502.0
2005-06	26161	574	423	151	62	4613	4.1	385	66.1	4998.0
2006-07	28711	649	464	185	73	5541	7.9	423	80.9	5964.0
CAGR 10th plan 2001-02 to 2006-07	8.8 %	11.6 %	10.3 %	15.2 %	13.5 %	13.3 %	500 %	431 % *	16.4 % *	15.4 %
2007-08	31380	722	519	203	92	6710	11.0	782	103.0	7492.0
2008-09	33510	744	531	213	93	6588	11.9	815	104.90	7403.0
2009-10	36190	850	561	289	101	6903	14.8	1016	115.80	7919.0
2010-11	39300	885	570	315	114	7537	17.5	1237	131.50	8774.0
2011-12 Estimate	42520	971	601	370	123	8200	31.3	2087	154.30	10287.0
CAGR 11th plan 2007-08 to 2011-12	7.9 %	7.7 %	3.7 %	16.2 %	7.5 %	5.1 %	29.9 %	27.8 %	10.6 %	8.2 %
Decadal Growth (2000-01 to 2010-11)	7.7%	9.2%	7.3%	13.7%	13.5%	11.8%	111%	109%#	15.2%#	13.5%

* Pertains to 2004-05 to 2006-07.

The Second factor that will increase container traffic is expected efficiency gains from greater containerization. An increase in containerization of general cargo from around 54 percent to nearer world averages of around 70 to 80 percent will reduce overall logistics costs, and thereby increase traffic volumes faster than the economy. According to a paper prepared by CRISIL titled container key sector trends, CAGR for container traffic is expected to grow at 11.2% by 2014-15. The commodity drivers for this growth are capital goods, textile and food grains. Though there are a wide range of factors that impact the volume of container trade, the correlation between GDP and container trade volume is considered pragmatic in forecasting the container trade.

For estimating the container traffic, the following are the under lying assumptions.

- Horizon period for projection is 2012-13 to 2016-17
- GDP growth at 9%, 9.5%, 10% and 11% per annum during 2012-17.
- Container penetration level is estimated to increase every year by 2.5% to reach 70%.

Since general cargo including container cargo has a strong correlation with GDP, the traffic estimates for other cargo including container cargo has been assessed based on the regression analysis for Major Ports.

Some of the empirical formulas commonly used are :

- Container trade growth rate = 10% + GDP growth rate
- Container trade growth rate = 2.5 to 3 times GDP growth rate

During 2000-01 to 2009-10 GDP: Container traffic through Major ports is in the ratio of 1:1.8 and in case of non major ports the ratio is 1:3.8 during 2006-11.

Regression Analysis:

142. The end use method based on sectoral study covers about 84% the cargo profile handled through Indian Ports Balance 16% comprises of heterogeneous mix viz. Cement, Limestone, Edible Oils, Manganese and other ores, Feldspar, Magnesite, Newsprint, Sugar, Steel Products etc. Out of these cargoes, traffic estimates for steel

products has been made separately. For Major ports, the trends in volume of other cargo and container cargo during 2001-02 to 2010–11 is given in Table 48.

Table 48: Trends in container traffic – Major Ports					
Year	Container cargo		Other cargo	Container and other cargo	Share of Container cargo
	Tonnage	TEUs			
2001-02	37,230	2,886	46,259	83,489	44.59%
2002-03	43,672	3,366	52,947	96,619	45.20%
2003-04	51,002	3,900	56,488	107,490	47.45%
2004-05	54,761	4,233	64,112	118,873	46.07%
2005-06	61,980	4,613	69,376	131,356	47.18%
2006-07	73,437	5,541	81,311	154,748	47.46%
2007-08	92,269	6,710	84,943	177,212	52.07%
2008-09	93,140	6,588	78,593	171,733	54.24%
2009-10	101,242	6,903	95,420	196,662	51.48%
2010-11	114,040	7,537	95,411	209,451	54.45%

In order to assess the cargo flow for this other cargo including container cargo, regression analysis has been adopted at 9%, 9.5%, 10% and 11% respectively as explained in succeeding paras.

- (a) Regression analysis for other cargo including container .
- (b) Regression analysis only for container cargo

a) The regression analysis for other cargo including container

It revealed that there is a strong correlation between the GDP and Other cargo including container cargo(coefficient of correlation 0.99). Further the coefficient of determination (R^2) revealed that more than 98% of the variations in the volume of other cargo including container cargo are explained by the variations in GDP. It could be seen further from the table above, that the share of container cargo in total other cargo

i.e., other than POL, Iron ore & pellets, Coal and Fertilizers during 2001-02 to 2010-11 has increased from 44.59% in 2001-02 to 54.45% in 2010-11. In line with increasing levels of containerization across the developing countries and keeping in view the recently commissioned / upcoming Mega container ports in the country (Vallarapadan, Vizinjim etc.), it is presumed that pace of containerization will increase from 55% in 2010-11 to reach 70% in 2016-17. In general, a conversion factor of 12.5 per tonne is adopted to arrive at number of TEUs in traffic estimates. However, recent trends observed in case of container traffic is that the average tonnage handled per container is varying between 14 to 15 tonnes and during 2010-11 it was 15.1 tonnes per TEU. As such a conversion factor of 14.5 Tonne per TEU is adopted so as to arrive at the number TEUs based on the above criteria.

b) Regression analysis exclusively for container cargo of Major ports

In this case, the regression analysis has been done using national GDP as independent variable and container traffic of Major Ports as dependent variable. The coefficient of determination (R^2) is 0.99 which shows a high degree of correlation between the two. At different levels of GDP growth, traffic forecast based on GDP is as below. Results of regression analysis are given in the Table 49.

Table 49 : Container traffic forecast using regression analysis				
Description	9%	9.5%	10%	11%
a)GDP vs Other Cargo including Container and				
- Level of Container at present level 55%	210	216	221	232
- Increasing level of containerization to reach 70% by 2016-17	268	274	281	295
GDP vs Container cargo	218	224	229	242

The figure obtained through macro analysis is verified with the empirical formula as explained below:

Major ports container traffic in MT in 2010-11 = 114.04 MT
 Target for container traffic in 2011-12 = 122.00 MT
 Estimated growth by 2016-17 using empirical formula: $1.8 \times 9\% = 16.2\%$

Under base case 1.8 times GDP growth of 7.9% achieved in the 11th plan is reckoned which worked out to 14.2% say 14%. Accordingly growth over 122 million tonnes is reckoned under base case which translates to 235 million tonnes. Under optimistic scenario, 267 million tonnes is reckoned at 17% (1.8 times 9.5%) growth rate for major ports. In case of non major ports, the coefficient of correlation is less than 0.9 because of the small sample. As such, the forecast of container traffic for non major ports is estimated using the empirical formula only. During the year 2007-12, the CAGR of container traffic was 29.9% as against CAGR of 7.9 during 2006-11 i.e. in the ratio of 1:3.8

Estimate by 2016-17 :

Target for 2011-12 = 21.6 million tonnes
 (17.56 x 23% CAGR recorded in 2006-10)

optimistic i.e. 36% CAGR = 100 million tonnes
 (GDP at 9.5%)

Base case (7.9 x 3.8 times =30%) = 80 million tonnes

To sum up container traffic for major and non major ports by 2016 – 17 would be as follows: -

2016-17	Major	Non major	Total
Base case	235	80	315
Optimistic	267	100	367

Other Cargo

Major Ports

The estimated traffic on account of other cargo based on regression analysis in respect of Major ports for the terminal year of 12th Plan.

(Million tonnes)

GDP growth	Estimated traffic
9%	115
9.5%	118
10%	121

Since steel products is likely to exhibit a strong growth rate the same has been dealt separately in the report to have a perspective of the development. The total other cargo traffic including steel products is considered as $(115 + 6) = 121$ MMT under base case and 124 million tonnes $(118+6)$ under optimistic scenario.

In case of non major ports the CAGR of other cargo registered 2007-12 as shown below:

Other Cargo Traffic – Non Major Ports

	MMT
2007-08	47.52
2011-12 (estimate)	65.93
CAGR	8.5%

The CAGR is the 1.1 times GDP growth in case of non major ports accordingly, the other cargo estimate for non major ports is as below:

Base case = 109 million tonnes $(9.5 \times 1.1 = 10.5)$
Optimistic = 111 million tonnes $(10 \times 1.1\% = 11\%)$

Traffic of other cargo including steel products is estimated at 115 million tonnes $(109+6)$ and 117 $(111+6)$ million tonnes respectively under base case and optimistic case.

The summary of traffic projection adopted by the Working Group based on the scenario writing and end use method is presented in Table 50.

(in Million Tonnes)

Commodity	Major Ports	Non-major Ports	Total
POL (incl.LNG)	249.49	230.70	480.19
IRON ORE (incl. Pellets)	112.00	78.00	190.00
FERT.& FRM	22.57	8.60	31.17
COAL (Coking & non-coking)	158.10	280.90	439.00
CONTAINERS	268.50	100.00	368.50
OTHERS	132.40	117.00	249.40
TOTAL	943.06	815.20	1758.26

Details of traffic projection year-wise by major ports, maritime States and commodity group for the 12th five year plan period is given in **Annexure 5.1(i) & 5.1(ii)**

5.3 Capacity Requirement at Indian Ports during 12th Plan

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 facilities. Keeping in view the projected traffic at Major & Minor ports (Table 51), the capacity required by Major and Non-major ports at the end of 12th Plan are given in Table 51:

OVERALL CAPACITY ESTIMATION BY THE END OF 12TH PLAN

COMMODITY	(in Million Tonnes)		
	Major Ports	Non-major	Total
POL (incl.LNG)	299.66	299.9	599.56
IRON ORE (incl. Pellets)	143.55	101.4	244.95
FERT.& FRM	16.81	11.2	28.01
COAL (Coking & non-coking)	178.65	365.2	543.85
CONTAINERS	306.19	130.0	436.19
OTHERS	284.38	152.1	436.48
TOTAL	1229.24	1059.80*	2289.04

(*) While giving the details of the capacity addition through various development plans, the overall capacity indicated by non-major ports has been indicated at 1457.42 million tonnes . The break-up of the capacity addition during 12th plan period by each Maritime state is given in table 52, however commodity-wise break-up of the same is not available.

The total capacity required at Major ports and Non-major Ports at the end of the 12th Plan are 1229.24 million tonnes and 1457.42 million tonnes respectively. The estimated capacity at the end of XIth Plan at all major ports is estimated to be 702.80 million tonnes while traffic is projected to reach 601 million tonnes. The major ports plan to increase capacity by 526.44 million tonnes during XIIth Plan. Estimated commodity-groupwise capacity at the end of 11th Five year Plan, Traffic Projections during terminal year of 12th Plan, capacity additions planned during 12th Plan and Estimated capacity at the end of 12th Five year plan in respect of each major port is given in **Annexure 5.2**.

Non-Major Ports

The existing capacity of non-major ports which is 418.29 million tonnes as on 31.03.2011 is estimated increase by various development plans envisaged during 12th plan period is at the level of 1457. 42 million tonnes by the end of XIIth Plan. Table 52 gives statewise capacity addition during XIIth Plan:

Table 52 : Statewise Capacity Addition During XIIIth Plan						
(Million tonnes)						
State	Traffic during 2010-11	Capacity as on 31.3.2011	Assessed Capacity as on 31.3.2012	Projected Traffic in 2016-17	Capacity addition during 2012-17	Assessed Capacity as on 13.3.2017
Gujarat	230.91	283.64	324.40	385.30	376.60	701.00
Maharashtra	14.87	38.25	48.56	80.00	153.72	202.28
Goa	14.58	13.90	18.40	12.10	1.10	19.50
Karnataka	3.09	9.95	10.70	33.00	49.50	60.20
Andhra Pradesh	42.61	44.00	84.00	129.85	127.50	211.50
Tamil Nadu	1.61	1.20	3.10	29.20	32.10	35.20
Kerala	6.97	0.29	0.29	9.25	19.39	19.68
Orissa		23.00	27.00	114.50	141.16	168.16
Pondicherry		4.06	28.20	22.00	11.70	39.90
Total State Ports	314.64	418.29	544.65	815.20	912.77	1457.42

The traffic projection, capacity estimation and the investment requirements for the 12th Plan period is based on optimistic scenario. The traffic projection given above corresponds to the GDP growth of 10%.

Summary of Traffic Projections and Capacity Planned by 2012-17

Table 53 gives summary of traffic projections and capacity planned by major ports and by maritime states in non-major ports.

Table 53 : Summary of Traffic projections and Capacity Estimation by the end of 12th Plan				
(in million tonnes)				
Ports	Traffic		Capacity	
	Projected 2011-12	By the end of 12 th Plan	Estimated (As on 31.03.12)	By end of 12 th plan (31-03-2017)
Major Ports	600.60	943.06	702.80	1229.24
Non- Major Ports	370.00	815.20	544.65	1457.42
TOTAL	970.60	1758.26	1247.45	2686.66

Annexure-5.1 (i)

COMMODITY WISE YEAR WISE PORT WISE PROJECTIONS FOR MAJOR PORTS 2012-17 – MOST LIKELY									
(IN MMT)									
PORT	YEAR	POL	IRON ORE (INCL.PEL LETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHER	TOTAL
						TONNAGE	TEUs		
KOLKATTA	2012-13	0.95	1.10	0.05	0.08	7.80	0.54	5.57	15.55
	2013-14	1.00	1.16	0.05	0.08	8.20	0.57	5.92	16.41
	2014-15	1.05	1.23	0.08	0.08	8.70	0.60	6.21	17.34
	2015-16	1.16	1.30	0.08	0.08	9.50	0.66	6.83	18.95
	2016-17	1.19	1.30	0.10	0.08	12.00	0.83	8.20	22.87
HALDIA DOCK COMPLEX	2012-13	11.00	6.00	10.55	0.38	2.90	0.20	7.03	37.86
	2013-14	12.00	6.70	12.19	0.38	3.30	0.23	8.02	42.59
	2014-15	13.00	6.80	12.98	0.38	3.50	0.24	8.50	45.16
	2015-16	14.00	6.85	14.06	0.38	3.70	0.26	9.09	48.08
	2016-17	16.00	7.00	15.70	0.40	4.10	0.28	10.00	53.20
PARADIP	2012-13	13.00	17.00	23.50	4.20	0.05	0.00	7.82	65.57
	2013-14	15.00	17.00	24.00	4.45	0.10	0.01	8.71	69.26
	2014-15	17.00	17.50	25.00	4.45	1.00	0.07	9.06	74.01
	2015-16	21.00	18.50	26.00	4.70	1.00	0.07	9.41	80.61
	2016-17	25.00	19.00	28.00	4.70	1.00	0.07	10.00	87.70
VISAKHAPATNAM	2012-13	16.00	16.40	14.50	5.67	4.20	0.29	8.14	64.91
	2013-14	17.00	16.40	14.50	5.72	4.70	0.32	8.46	66.78
	2014-15	17.50	17.00	16.50	5.87	5.20	0.36	9.13	71.20
	2015-16	19.50	18.00	18.50	5.75	5.80	0.40	9.66	77.21
	2016-17	20.00	19.00	18.50	6.00	6.50	0.45	10.00	80.00

PORT	YEAR	POL	IRON ORE (INCL.PEL LETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHER	TOTAL
						TONNAGE	TEUs		
ENNORE	2012-13	0.50	6.00	20.81	0.00	0.00	0.00	0.13	27.44
	2013-14	0.60	8.00	27.98	0.00	0.00	0.00	0.13	36.71
	2014-15	0.80	8.00	28.75	0.00	12.10	0.83	0.25	49.90
	2015-16	3.20	10.00	34.07	0.00	27.00	1.86	0.25	74.52
	2016-17	3.20	12.00	37.00	0.00	30.00	2.07	0.25	82.45
CHENNAI	2012-13	16.50	0.00	0.00	0.70	26.70	1.84	9.09	52.99
	2013-14	17.50	0.00	0.00	0.70	26.70	1.84	9.50	54.40
	2014-15	19.00	0.00	0.00	0.70	30.00	2.07	9.98	59.68
	2015-16	20.00	0.00	0.00	0.70	32.00	2.21	10.47	63.17
	2016-17	21.50	0.00	0.00	0.74	36.50	2.52	11.00	69.74
TUTICORIN	2012-13	0.70	0.00	15.50	1.55	6.60	0.46	8.24	32.59
	2013-14	0.70	0.00	18.50	1.65	7.10	0.49	9.86	37.81
	2014-15	0.80	0.00	21.00	1.75	8.50	0.59	10.74	42.79
	2015-16	0.80	0.00	24.00	1.75	9.20	0.63	11.63	47.38
	2016-17	0.84	0.00	26.00	2.00	10.00	0.69	10.00	48.84
COCHIN	2012-13	13.00	0.00	0.00	0.30	11.50	0.79	2.28	27.08
	2013-14	14.50	0.00	0.00	0.30	15.00	1.03	2.61	32.41
	2014-15	15.50	0.00	0.00	0.35	17.00	1.17	2.95	35.80
	2015-16	19.00	0.00	0.00	0.40	17.80	1.23	3.48	40.68
	2016-17	22.50	0.00	0.00	0.50	18.50	1.28	4.00	45.50

PORT	YEAR	POL	IRON ORE (INCL.PEL LETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHER	TOTAL
						TONNAGE	TEUs		
NEW MANGALORE	2012-13	24.00	4.00	4.15	0.80	0.60	0.04	6.11	39.66
	2013-14	27.00	4.40	4.35	0.80	0.65	0.04	6.81	44.01
	2014-15	31.00	4.90	5.29	0.80	0.70	0.05	7.58	50.28
	2015-16	31.00	8.50	4.81	0.80	0.70	0.05	5.31	51.12
	2016-17	33.00	10.00	5.00	0.80	0.70	0.05	4.00	53.50
MORMUGAO	2012-13	0.80	38.00	8.00	0.05	0.20	0.01	4.04	51.09
	2013-14	0.80	38.00	8.00	0.05	0.20	0.01	4.30	51.35
	2014-15	0.80	38.00	8.31	0.05	0.20	0.01	4.45	51.81
	2015-16	0.80	38.00	10.15	0.05	0.20	0.01	4.76	53.97
	2016-17	1.00	40.00	12.00	0.05	0.20	0.01	5.00	58.25
MUMBAI	2012-13	36.30	2.70	5.14	0.50	3.00	0.21	8.20	55.84
	2013-14	36.90	2.70	5.14	0.50	4.00	0.28	8.83	58.08
	2014-15	37.40	2.70	5.14	0.55	6.00	0.41	9.17	60.96
	2015-16	37.90	2.70	5.66	0.60	6.50	0.45	10.55	63.90
	2016-17	38.50	2.70	6.00	0.70	7.50	0.52	12.00	67.40
JNPT	2012-13	3.96	0.00	0.00	0.00	67.50	4.66	2.25	73.71
	2013-14	3.96	0.00	0.00	0.00	76.30	5.26	2.25	82.51
	2014-15	3.96	0.00	0.00	0.00	91.50	6.31	2.25	97.71
	2015-16	3.96	0.00	0.00	0.00	109.40	7.54	2.25	115.61
	2016-17	3.96	0.00	0.00	0.00	134.00	9.24	2.25	140.21

PORT	YEAR	POL	IRON ORE (INCL.PEL LETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHER	TOTAL
						TONNAGE	TEUs		
KANDLA	2012-13	42.20	0.60	2.64	6.17	2.90	0.20	20.91	75.42
	2013-14	43.95	0.60	4.49	6.17	3.00	0.21	21.78	79.99
	2014-15	45.70	0.60	6.26	6.27	3.10	0.21	22.64	84.57
	2015-16	51.50	0.70	8.03	6.37	3.55	0.24	25.55	95.70
	2016-17	72.50	1.00	9.80	6.60	5.00	0.34	36.00	130.90
PORT BLAIR	2012-13	0.18	0.00	0.00	0.00	1.00	0.07	0.76	1.94
	2013-14	0.19	0.00	0.00	0.00	1.00	0.07	0.79	1.98
	2014-15	0.20	0.00	0.00	0.00	1.00	0.07	0.82	2.02
	2015-16	0.22	0.00	0.00	0.00	1.00	0.07	0.92	2.14
	2016-17	0.23	0.00	0.00	0.01	1.00	0.03	1.30	2.50
TOTAL	2012-13	179.09	91.80	104.85	20.40	134.95	9.31	90.57	621.66
	2013-14	191.10	94.97	119.21	20.80	150.25	10.36	97.94	674.27
	2014-15	203.71	96.73	129.32	21.25	188.50	13.00	103.72	743.22
	2015-16	224.04	104.55	145.36	21.58	227.35	15.68	110.17	833.04
	2016-17	259.42	112.00	158.10	22.58	267.00	18.37	124.00	943.06

Annexure 5.1 (ii)

COMMODITY WISE YEAR WISE MARITIME STATE WISE PROJECTIONS FOR NON MAJOR PORTS 2012-17-OPTIMISTIC									
(INMMT)									
PORT	YEAR	POL	IRON ORE (INCL. PELLETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHERS	TOTAL
						TONNAGE	MTEUs		
GUJARAT	2012-13	162.00	11.00	43.00	3.30	25.00	1.72	30.00	274.30
	2013-14	173.00	12.00	48.00	3.30	32.00	2.21	34.00	302.30
	2014-15	180.00	13.00	53.00	3.30	40.00	2.76	38.00	327.30
	2015-16	190.00	15.00	59.00	3.30	50.00	3.45	40.00	357.30
	2016-17	200.00	16.00	66.00	3.30	60.00	4.14	40.00	385.30
MAHARASTRA	2012-13	0.50	6.00	20.00	0.00	0.70	0.05	10.00	37.20
	2013-14	1.00	7.00	25.00	0.00	0.90	0.06	12.00	45.90
	2014-15	1.50	8.00	30.00	0.00	1.20	0.08	14.00	54.70
	2015-16	5.00	10.00	36.00	0.00	1.50	0.10	16.00	68.50
	2016-17	8.00	12.00	42.00	0.00	2.00	0.14	16.00	80.00
GOA	2012-13	0.00	8.00	0.10	0.00	0.00	0.00	0.00	8.10
	2013-14	0.00	10.00	0.10	0.00	0.00	0.00	0.00	10.10
	2014-15	0.00	10.00	0.10	0.00	0.00	0.00	0.00	10.10
	2015-16	0.00	12.00	0.10	0.00	0.00	0.00	0.00	12.10
	2016-17	0.00	12.00	0.10	0.00	0.00	0.00	0.00	12.10
KARNATAKA	2012-13	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00
	2013-14	0.00	1.00	0.00	0.00	0.00	0.00	10.00	11.00
	2014-15	0.00	2.00	0.00	0.00	0.00	0.00	20.00	22.00
	2015-16	0.00	2.00	0.00	0.00	0.00	0.00	25.00	27.00
	2016-17	0.00	3.00	0.00	0.00	0.00	0.00	30.00	33.00

PORT	YEAR	POL	IRON ORE (INCL.PELLETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHERS	TOTAL
ANDHRA PRADESH	2012-13	2.00	16.00	32.00	2.00	3.00	0.21	11.00	66.00
	2013-14	3.00	18.00	42.00	3.00	9.00	0.62	14.00	89.00
	2014-15	3.00	19.00	50.00	4.00	15.00	1.03	14.00	105.00
	2015-16	3.40	20.00	58.00	4.30	18.00	1.24	15.00	118.70
	2016-17	3.55	20.00	66.00	4.30	20.00	1.38	16.00	129.85
TAMILNADU	2012-13	3.00	0.30	2.00	0.05	0.30	0.02	0.25	5.90
	2013-14	4.00	0.40	14.00	0.50	0.40	0.03	0.75	20.05
	2014-15	4.00	0.60	16.50	0.05	0.60	0.04	1.25	23.00
	2015-16	5.00	0.80	18.50	0.15	0.80	0.06	1.50	26.75
	2016-17	5.00	1.00	20.00	0.20	1.00	0.07	2.00	29.20
KERALA	2012-13	0.07	0.00	1.50	0.08	1.20	0.08	0.50	3.35
	2013-14	0.08	0.00	2.00	0.15	2.00	0.14	1.00	5.23
	2014-15	0.12	0.00	2.10	0.20	3.00	0.21	1.50	6.92
	2015-16	0.13	0.00	2.20	0.25	4.00	0.28	2.00	8.58
	2016-17	0.15	0.00	2.30	0.30	4.50	0.31	2.00	9.25
ORISSA	2012-13	0.00	8.00	27.00	0.30	0.00	0.00	3.00	38.30
	2013-14	0.00	10.00	42.00	0.40	0.00	0.00	5.00	57.40
	2014-15	12.00	12.00	52.00	0.50	4.00	0.28	7.00	87.50
	2015-16	12.00	14.00	62.00	0.50	5.00	0.34	8.00	101.50
	2016-17	12.00	14.00	72.00	0.50	6.00	0.41	10.00	114.50

PORT	YEAR	POL	IRON ORE (INCL.PELLETS)	COAL (COKING + NON COKING)	FERT & FRM (DRY)	CONTAINERS		OTHERS	TOTAL
PONDICHERRY	2012-13	1.00	0.00	6.00	0.00	1.00	0.07	1.00	9.00
	2013-14	1.00	0.00	8.00	0.00	2.00	0.14	1.00	12.00
	2014-15	2.00	0.00	10.00	0.00	3.50	0.24	1.00	16.50
	2015-16	2.00	0.00	11.50	0.00	5.00	0.34	1.00	19.50
	2016-17	2.00	0.00	12.50	0.00	6.50	0.45	1.00	22.00
TOTAL	2012-13	168.57	49.30	131.60	5.73	31.20	2.15	60.75	447.15
	2013-14	182.08	58.40	181.10	7.35	46.30	3.19	77.75	552.98
	2014-15	202.62	64.60	213.70	8.05	67.30	4.64	96.75	653.02
	2015-16	217.53	73.80	247.30	8.50	84.30	5.81	108.50	739.93
	2016-17	230.70	78.00	280.90	8.60	100.00	6.90	117.00	815.20

Annexure 5.2

PORT WISE & COMMODITY WISE CAPACITIES FOR MAJOR PORTS 2012–17

(million tonnes)

	YEAR	CONTAINER	POL	IRON ORE	COAL	FERTILISERS	OTHER CARGO	TOTAL
KANDLA	2011-12	7.20	62.83	0.00	0.00	0.00	17.28	87.31
	2012-13	7.20	62.83	0.00	0.00	0.00	17.28	87.31
	2013-14	7.20	62.83	0.00	0.00	0.00	32.68	102.71
	2014-15	7.20	62.83	0.00	0.00	2.00	56.60	128.63
	2015-16	7.20	74.83	0.00	0.00	2.00	56.60	140.63
	2016-17	7.20	74.83	0.00	0.00	2.00	61.10	145.13
JNPT	2011-12	59.47	5.50	0.00	0.00	0.00	0.90	65.87
	2012-13	59.47	5.50	0.00	0.00	0.00	0.90	65.87
	2013-14	73.21	5.50	0.00	0.00	0.00	0.90	79.61
	2014-15	73.21	5.50	0.00	0.00	0.00	0.90	79.61
	2015-16	73.21	5.50	0.00	0.00	0.00	0.90	79.61
	2016-17	143.21	5.50	0.00	0.00	0.00	6.90	155.61
MUMBAI	2011-12	1.00	32.00	0.00	0.00	0.00	11.53	44.53
	2012-13	10.60	32.00	0.00	0.00	0.00	11.53	54.13
	2013-14	10.60	32.00	0.00	0.00	0.00	11.53	54.13
	2014-15	10.60	34.00	0.00	0.00	0.00	18.53	63.13
	2015-16	10.60	34.00	0.00	0.00	0.00	18.53	63.13
	2016-17	10.60	46.00	0.00	0.00	0.00	22.53	79.13
MORMUGAO	2011-12	0.00	1.50	33.00	0.00	0.00	7.40	41.90
	2012-13	0.00	1.50	33.00	0.00	0.00	7.40	41.90
	2013-14	0.00	1.50	33.00	4.61	0.00	7.40	46.51
	2014-15	0.00	1.50	33.00	4.61	0.00	7.40	46.51
	2015-16	0.00	1.50	42.20	4.61	0.00	7.40	55.71
	2016-17	0.00	1.50	50.20	8.61	0.00	12.40	72.71

PORT	YEAR	CONTAINER	POL	IRON ORE	COAL	FERTILISERS	OTHER CARGO	TOTAL
COCHIN	2011-12	12.50	18.70	0.00	0.00	0.80	8.98	40.98
	2012-13	12.50	21.20	0.00	0.00	0.80	8.98	43.48
	2013-14	18.75	25.30	0.00	0.00	0.80	8.98	53.83
	2014-15	18.75	25.30	0.00	0.00	0.80	8.98	53.83
	2015-16	18.75	25.30	0.00	0.00	0.80	8.98	53.83
	2016-17	18.75	27.30	0.00	1.00	0.80	9.98	57.83
NEW MANGALORE	2011-12	0.00	23.37	7.50	5.40	0.00	14.70	50.97
	2012-13	4.50	31.17	14.12	5.40	0.00	14.70	69.89
	2013-14	4.50	31.17	14.12	5.40	0.00	14.70	69.89
	2014-15	4.50	31.17	14.12	5.40	0.00	14.70	69.89
	2015-16	4.50	40.17	14.12	11.40	0.00	14.70	84.89
	2016-17	4.50	40.17	14.12	11.40	0.00	14.70	84.89
V.O.CHIDAM BARANAR	2011-12	5.00	2.30	0.00	12.55	0.00	13.49	33.34
	2012-13	5.00	2.30	0.00	12.55	0.00	13.49	33.34
	2013-14	5.00	2.30	0.00	16.95	0.00	13.49	37.74
	2014-15	12.20	2.30	0.00	23.95	0.00	23.79	62.24
	2015-16	12.20	2.30	0.00	30.95	0.00	36.09	81.54
	2016-17	12.20	2.30	0.00	30.95	0.00	36.09	81.54
CHENNAI	2011-12	42.00	11.80	8.00	0.00	0.00	17.92	79.72
	2012-13	42.00	11.80	8.00	0.00	0.00	17.92	79.72
	2013-14	42.00	11.80	8.00	0.00	0.00	18.92	80.72
	2014-15	42.00	11.80	8.00	0.00	0.00	19.92	81.72
	2015-16	42.00	11.80	8.00	0.00	0.00	19.92	81.72
	2016-17	66.00	11.80	8.00	0.00	0.00	28.92	114.72
ENNORE	2011-12	0.00	3.00	6.00	21.00	0.00	1.00	31.00
	2012-13	0.00	3.00	12.00	21.00	0.00	1.00	37.00
	2013-14	0.00	3.00	12.00	21.00	0.00	1.00	37.00
	2014-15	0.00	3.00	12.00	21.00	0.00	1.00	37.00
	2015-16	0.00	3.00	12.00	39.00	0.00	1.00	55.00
	2016-17	18.00	8.00	12.00	39.00	0.00	1.00	78.00

PORT	YEAR	CONTAINER	POL	IRON ORE	COAL	FERTILISERS	OTHER CARGO	TOTAL
KOLKATA	2011-12	5.73	4.11	0.00	0.00		6.51	16.35
	2012-13	5.73	4.11	0.00	0.00		6.51	16.35
	2013-14	5.73	4.11	0.00	0.00		6.51	16.35
	2014-15	5.73	4.11	0.00	0.00		6.51	16.85
	2015-16	5.73	4.11	0.00	0.00		7.01	16.85
	2016-17	15.73	4.11	0.00	0.00		13.01	32.85
HALDIA	2011-12	4.00	17.00	8.00	7.00	0.00	14.70	50.70
	2012-13	4.00	17.00	8.00	7.00	0.00	14.70	50.70
	2013-14	4.00	17.00	8.00	7.00	0.00	14.70	50.70
	2014-15	4.00	17.00	8.00	7.00	0.00	14.70	50.70
	2015-16	4.00	17.00	10.30	13.25	0.00	14.70	59.25
	2016-17	4.00	17.00	12.75	21.25	0.30	15.80	71.10
PARADIP	2011-12	0.00	23.50	8.50	22.50	7.50	23.50	85.50
	2012-13	0.00	23.50	8.50	22.50	7.50	23.50	85.50
	2013-14	0.00	23.50	8.50	22.50	7.50	23.50	85.50
	2014-15	0.00	33.50	18.50	32.50	7.50	28.50	120.50
	2015-16	0.00	33.50	18.50	32.50	7.50	28.50	120.50
	2016-17	0.00	33.50	18.50	37.50	7.50	28.50	125.50
VIZAG	2011-12	2.50	25.65	12.50	0.00	1.00	32.98	74.63
	2012-13	2.50	25.65	12.50	10.18	1.00	28.84	80.67
	2013-14	2.50	25.65	12.50	23.94	6.21	29.19	99.99
	2014-15	2.50	27.65	27.98	28.94	6.21	33.45	126.73
	2015-16	6.00	27.65	27.98	28.94	6.21	33.45	130.23
	2016-17	6.00	27.65	27.98	28.94	6.21	33.45	130.23

ALL MAJOR PORTS

2011-12	139.40	231.26	83.50	68.45	9.30	170.89	702.80
2012-13	153.50	241.56	96.12	78.63	9.30	166.75	745.86
2013-14	173.49	245.66	96.12	101.40	14.51	183.35	814.68
2014-15	180.69	259.66	121.60	123.40	16.51	235.48	937.34
2015-16	184.19	280.66	133.10	160.65	16.51	247.78	1022.89
2016-17	306.19	299.66	143.55	178.65	16.81	284.38	1229.24

CHAPTER-6

DEVELOPMENT SCHEMES FOR PORT SECTOR

6.1 The development proposals for the 12th Five Year Plan for the port sector and others have been divided into following three parts:

- (A) Development proposal for Major Ports;
- (B) Development proposal for other organizations like ALHW, DCI, etc.;
- (C) Development proposal for Non-Major Ports

6.2 Development Proposal for Major Ports

The development schemes/proposals for 12th Five Year Plan period have been considered by providing the outlay as per the following Funding pattern:

- (a) Schemes to be taken through their internal resources
- (b) Through Extra Budgetary Resources (EBR)
- (c) Through Budgetary Support from the Government
- (d) Schemes taken up by private sector participation including Joint Venture proposal.

In the previous chapter, the traffic through Major ports is estimated at 943.06 million tonnes by the terminal year of the 12th plan as against 570.03 million tonnes handled in 2010-11. In respect of Non-major ports, the traffic is likely to touch 815.20 million tonnes against 314.64 million tonnes handled in 2010-11. The total traffic through Indian ports would be of the order of 1,758.26 million tonnes from the present level of 884.67 million tonnes in 2010-11.

In order to handle the projected levels of traffic, both major ports have conceptualized capacity augmentation schemes while non-major ports have devised schemes for capacity augmentation as well as development of new ports. Under this backdrop, the capacity requirement for major ports has been estimated at the level of 526.44 MT during the 12th Plan period and the total available capacity at the end of 12th Plan is estimated at 1229.24 MT. The Major Ports have identified

projects for deepening of channel/berths, construction/reconstruction of berths/jetties, procurement of equipment/floating craft, rail and road connectivity projects and other demanding schemes in order to meet the capacity requirement. The schemes at the individual port have been identified under these five broad categories accordingly.

6.2.1 Proposed Outlay for 12th Plan

The total proposed outlay for the 12th Plan period is Rs. 22757.39 crore, which excludes the Private Sector Investment. The details of funding pattern for Major Ports are as under:

Internal Resources	-	Rs. 13416.18 Crore
EBR & Others	-	Rs. 6294.99 Crore
Budgetary Support	-	Rs. 3046.22 Crore
Total Outlay:		Rs. 22757.39 Crore

As may be seen from the funding pattern detailed above, the requirements of funds from Internal resources of the Major Ports are of very high order. It has to be recognized that some of the projects, particularly the one relating to replacement and modernization of plant and equipment cannot be deferred till sufficient build up of Internal resources with ports. In this context, an institutional financing arrangement to advance capital to ports in this regard may be useful to ensure timely availability of capital to port.

6.2.2 Schemes to be taken-up under Private Sector Participation

The private sector investment anticipated for the Major Ports during the 12th plan period is Rs. 51036.56 crore.

Details of port-wise funding pattern is given under **Annexure-6.1** and schemes to be undertaken in various heads including schemes proposed for the private sector during 12th Plan period is given under **Annexure-6.2(i) & 6.2(ii)**. It is pertinent to mention that a provision of Rs 1500 crore have been made under I.R. for initial equity capital for IP Global, which will be equally contributed i.e. Rs 250 crore by JNPT, MBPT, KPT, VPT, CHPT, PPT.

6.3 Development proposal for other organizations like ALHW, DCI, etc.

The organizations covered under others categories includes DCI, ALHW, Post Tsunami, Sethusamundram Corporation Limited, Non-Major Ports, R&D Studies, Tariff Authority, IT for Department of Shipping and Survey vessels. Details of the various proposals to be undertaken during 12th Plan period and their respective outlays for the above organizations is given below:

(Rs. in Crores)

Sl. No.	Other Organisations	12th Plan Outlay	Funding Pattern		
			I.R.	EBR & Others	B.S.
1	DCI	1972.00	1972.00		
2	ALHW	904.75			904.75
3	SCL	100.00			100.00
4	Assistance for studies to State Governments for Non-Major Ports	10.00			10.00
5	IT for Dept of Shipping	15.00			15.00
6	Green Port Initiatives	220.00			220.00
7	Development of Major Port in Maritime States	200.00			200.00
8	R&D Studies	7.50			7.50
9	Web Based PCS	5.00			5.00
10	Survey Vessels	30.00			30.00
	TOTAL:	3464.25	1972.00	0.00	1492.25

6.3.1 Proposals for Twelfth Five Year Plan:

6.3.1.1 Andaman & Lakhdweep Works (ALHW)

(a) Andaman Nicobar Islands: ALHW in consultation with Andaman Nicobar Administration proposed the following four new schemes to be taken up under 12th Five Year Plan for the development of Ports and Harbours in ANI.

- i. Extension of breakwater by 300 Meters at Campbell Bay in Great Nicobar Island at an estimated cost of Rs. 250.00 crore.
- ii. Construction and development of berth for container vessels of 14 meter draft at Blair Reef in Port Blair at an estimated cost of Rs. 300.00 crore.
- iii. Replacement and up gradation of cargo handling equipment in various ports of ANI at an estimated cost of Rs. 30.00 crore.

- iv. Additional approach to wharf at Hut Bay at Rs. 45.00 crore.

In addition to above, there is a proposal to develop “Container Transshipment Port at Campbell Bay in Great Nicobar Island” on PPP basis during 12th Five Year Plan, for which A & N Administration has initiated a feasibility study on the subject.

(b) Lakshadweep:

As desired by Lakshadweep Administration for development of shipping and port facilities in Lakshadweep, ALHW has proposed for creation of all weather ports in all the 10 inhabitant Islands by constructing breakwater/dredging the lagoons up to 4 meters depth. Techno-environmental viability of these projects are yet to be established. Islands are ecologically very sensitive hence possibility of these projects has to be assessed before taking up the proposed Projects. During 12th Plan feasibility studies will be under taken for construction of Breakwater at Amini, Kadamath, Kiltan, Chetlath and Bitra. In addition to the above the following are the major schemes to be taken up during 12th Five Year Plan.

- i. Extension of 3rd stage Breakwater at Androth at a cost of Rs. 425 cores.
- ii. Dredging of navigational channels and providing Navigational Aids at a cost of Rs. 50 crore.
- iii. Providing Shipway with workshop facilities at Kavaratti, Minicoy, Kadamath, Agatti and Chetlath at a cost of Rs. 20 crore.
- iv. Improvement of Eastern side embarkation facilities as recommended by Capt. Mohan at a cost of Rs. 6.0 crore.

List of projects proposed to be taken up in 12th Plan and year wise fund requirement is attached as **Annexure-6.3**.

The summary of the outlay of Rs. 904.75 crore proposed for 12th Plan period for ALHW is as per the details given in the table below, for works to be carried out in Andaman Nicobar and Lakshadweep Islands.

(Rs in Crore)						
Description	Cont. schemes		New schemes		Total	
	Nos.	12 th Five Year Plan Outlay	Nos.	12 th Five Year Plan Outlay	Nos.	12 th Five Year Plan Outlay
A & N Islands	8	209.09	4	315.20	12	524.29
Lakshadweep Islands.	3	1.26	6	334.20	8	335.46
Establishment						45.00
Total	11	210.35	10	649.40	20	904.75

6.3.1.2 Dredging Corporation of India (DCI)

The review of physical and financial performance in execution of 11th plan schemes of DCI has already been included in Chapter-2 and Chapter-9. During 12th Five Year Plan an outlay of Rs 1972 crore. has been proposed, which will be entirely met from the Internal & Extra Budgetary Resources of the Corporation and no Budgetary Support is contemplated. Year wise phasing is as under.

(Rs in crore)		
S.No	Year	Outlay
1	2012-13	586.00
2	2013-14	419.00
3	2014-15	311.00
4	2015-16	353.00
5	2016-17	303.00
	Total	1972.00

The scheme-wise / year-wise phasing of schemes to be taken up by DCI in 12th plan is given in **Annexure-6.4(i)**. The present capacity of TSHD and CSD of DCI are 73.60 Mm³ and 11.85 Mm³ respectively, which may also be taken as capacity as on 31.03.2012. After addition of 3 TSHD of 5500Cum and TSHD of 9000Cum the capacity of TSHD would be 110.42 Mm³. After adding with CSD capacity 11.85 Mm³, capacity of DCI is expected to increase to 122.27 Mm³. A statement showing the year-wise projected capacities of TSHD, CSD during the 12th Plan period is at **Annexure-6.4(ii)**.

6.3.1.3 Research and Development Schemes

A provision of Rs.7.50 crore is proposed for inclusion in the 12th plan as outlay for R & D schemes. Annual requirement during this period is given in **Annexure-6.5**.

SL. No.	Nomenclature	Amount (Rs. In crore)
1	Development of deep draft port in Andhra Pradesh	5.00
2	MSDC meeting	1.50
3	R & D schemes (ongoing & new schemes)	1.00
	Total	7.50

6.3.1.4 Sethusamudram Corporation Limited

The scheme of Sethusamudram Ship Channel Project with sanctioned cost of Rs. 2427.40 crore was included in the tenth five year plan with an outlay of Rs. 604 crore and the balance as spill over in the 11th five year plan. During 11th Plan period total 28.42 Mm³ capital dredging was carried out

Project is under subjudice, therefore, No Capital Dredging provision is made in the 12th Five Year Plan. However, a token outlay of **Rs. 100.00 crore** is recommended for the project.

6.3.1.5 Green Port Initiatives

World over many ports are taking initiative toward reduction of carbon emission and carbon foot prints by various measures by which green ships/green ports are promoted. In India also there is a need to take up some initiative in line with other international ports for which a provision of Rs 220.00 crore is proposed under Budgetary Support. These initiatives includes measures to be taken at policy level and port level which are outlined in chapter-15.

6.3.1.6 Development of Major Ports in Maritime States

In order to develop more Major Ports in Maritime State, Ministry of Shipping, GOI addressed to Chief Minister of Maritime States to identify the location and the required land for setting up of a Major Port in each state. Towards this

endeavor, a lump sum provision of Rs 200.00 crore is kept to meet the pre-development expenses.

6.3.1.7 Outlay for Other Organisations

In addition to above, provisions through Budgetary Support have also been made as Rs. 10 crore for assistance for studies to State Governments for Non-major ports from Department of Shipping, Rs. 5.00 crore for Web Based Port Community System(PCS) and Rs. 30.00 crore for Survey vessels.

6.4 Development proposal for Non-Major Ports

The projected traffic through Non-major Ports by the terminal year of the 12th Plan is about 815.20 million tonnes. To meet the projected traffic, the respective Non-major Ports have formulated various developmental programmes during the 12th Plan period. The table below presents the details of estimated capacity by the end of 11th Five Plan period and the proposed capacity addition and investments during the 12th Plan period.

The existing capacity of non-major ports which is 418.29 million tonnes as on 31.03.2011 is estimated increase to 1457.42 million tonnes by the end of 12th Plan. State wise planned capacity addition during 12th Plan is given as follows.

State wise Capacity Addition During XIIth Plan						
(Million tonnes)						
State	Traffic during 2010-11	Capacity as on 31.3.2011	Assessed Capacity as on 31.3.2012	Projected Traffic in 2016-17	Capacity addition during 2012-17	Assessed Capacity as on 31.3.2017
Gujarat	230.91	283.64	324.40	385.30	376.60	701.00
Maharashtra	14.87	38.25	48.56	80.00	153.72	202.28
Goa	14.58	13.90	18.40	12.10	1.10	19.50
Karnataka	3.09	9.95	10.70	33.00	49.50	60.20
Andhra Pradesh	42.61	44.00	84.00	129.85	127.50	211.50
Tamil Nadu	1.61	1.20	3.10	29.20	32.10	35.20
Kerala	6.97	0.29	0.29	9.25	19.39	19.68
Orissa		23.00	27.00	114.50	141.16	168.16
Pondicherry		4.06	28.20	22.00	11.70	39.90
Total State Ports	314.64	418.29	544.65	815.20	912.77	1457.42

The estimated capacity by the end of 11th Plan period i.e. as on 31-3-2012 for Non-Major Ports is 544.65 Million Tonnes. The capacity addition planned by respective Maritime States for their Non-major Ports during 12th Plan period is at the level of 912.77 Million Tonnes. The State-wise details of existing capacity by the end of 11th Plan period and the capacity addition during 12th Plan period has already been discussed in Chapter-5.

Maritime states have drawn ambitious programmes to create additional capacity during 12th Plan. The states have identified projects for development of non-major ports at an estimated cost of Rs 1,06,832 crore for creation of additional capacity of 1039 million tonnes. Private sector is envisaged to fund most of the projects through PPP or BOT or BOOT basis. It is envisaged that private sector will meet 98.1% of the cost of development amounting to Rs 1,04,808 crore. Remaining requirement of Rs. 2024.68 crore is planned to be contributed by State Governments through Internal Resources / Gross budgetary Support/ Internal Extra budgetary Resources. State wise estimated cost of projects during 12th Plan alongwith sources of financing and capacity likely to be added is given as follow:

State wise Investment plans during XIIth Plan					
Maritime	Investment 2012-17	Source of funding (Rs. Crore)			
		IR	GBS	EBR	PPP
Gujarat	45,240.00				45,240.00
Maharashtra	18,218.00	690.00	--	1270.00	16258.00
Goa	64.68	64.68	--		
Karnataka	6,031.00				6031.00
Andhra Pradesh	15,200.00				15,200.00
Orissa	13,184.00				13,184.00
Tamilnadu	6,564.00				6,564.00
Kerala	1,368.00				1,368.00
Pondicherry	963.00				963.00
TOTAL	1,06,832.68	754.68		1,270.00	1,04,808.00

Source: Information received from GMB/AP/Goa and Annexure XII of Maritime Agenda 2010-20

A list indicating the important development schemes to be taken up during 12th Plan period by respective State Governments/Maritime Boards for their Non-major ports is given at **Annexure-6.6**.

6.5 Summary of Traffic Projections, Capacity and Investment 2012-17

Summary of traffic projections, capacity and investments planned by major ports and by maritime states in non-major ports is given as below:

Summary of Traffic Projections, Capacity and Investment								
	Traffic Projected (2016-17) (In million Tonnes)	Capacity (2016-17) In million Tonnes		Investment Planned (In Crore)				
		As on 31.03.12	As on 31.03.17	IR	GBS	EBR	PPP	TOTAL
Major Ports	943.06	702.80	1229.24	13416.18	3046.22	6294.99	51036.56	73793.95
Non Major Ports	815.20	544.65	1457.42	754.68		1270.00	104808.00	106832.68
TOTAL	1758.26	1247.45	2686.66	14170.86	3046.22	7564.99	155844.56	180626.63

Annexure-6.1

12th PLAN OUTLAY FOR MAJOR PORTS and Other Organizations
[FUNDING PATTERN] **(Rs in crore)**

Sl. No.	Ports	12 th Plan Outlay	Funding Pattern			Private Sector
			I.R.	GBS	EBR and Others	
(A)	MAJOR PORTS					
1(a)	KOLKATA	73.91	73.91	0.00	0.00	2553.38
1(b)	HALDIA	338.05	338.05	0.00	0.00	1062.23
1(c)	R.R.Schemes	1020.22		1020.22	0.00	0.00
	TOTAL KOLKATA	1432.18	411.96	1020.22	0.00	3615.61
2	PARADIP (*)	963.14	744.26	93.00	125.88	1449.79
3	VISAKHAPATNAM(*)	2287.91	2287.91	0.00	0.00	3365.60
4	ENNORE	1876.00	476.00	570.00	830.00	130.00
5.	CHENNAI (*)	3069.45	968.34	73.00	2028.11	2447.25
6.	TUTICORIN	3032.7	1235.70	0.00	1797.00	3356.03
7.	COCHIN	347.00	97.00	210.00	40.00	1368.00
8.	NEW MANGALORE	691.17	361.17	330.00	0.00	990.76
9.	MORMUGAO	993.00	153.00	750.00	90.00	1917.30
10.	MUMBAI (*)	2024.81	2024.81	0.00	0.00	1700.52
11.	J.N.P.T.(*)	4215.05	2831.05	0.00	1384.00	17402.00
12.	KANDLA (*)	1824.98	1824.98	0.00	0.00	13293.70
	TOTAL(A)	22757.39	13416.18	3046.22	6294.99	51036.56
(B)	OTHERS					
14.	DCI	1972.00	1972.00	0.00	0.00	0.00
15.	ALHW	904.75	0.00	904.75	0.00	0.00
16.	SCL	100.00	0.00	100.00	0.00	0.00
17.	Assistance for studies to State Govt. for Non-Major Ports	10.00	0.00	10.00	0.00	0.00
18.	IT for dept. of shipping	15.00	0.00	15.00	0.00	0.00
19.	Green Port Initiatives	220.00	0.00	220.00	0.00	0.00
20.	Dev. of Major Port in Maritime State	200.00	0.00	200.00	0.00	
19.	R&D Studies	7.50	0.00	7.50	0.00	0.00
20.	Web based PCS	5.00	0.00	5.00	0.00	0.00
21.	Survey Vessels	30.00	0.00	30.00	0.00	0.00
	TOTAL(B)	3464.25	1972.00	1492.25	0.00	0.00
	TOTAL (A + B)	26021.64	15388.18	4338.47	6294.99	51036.56

Note : (*) A provision of Rs 250.00 crore made under I.R. for IP Global Equity Contribution

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KOLKATA DOCK SYSTEM UNDER KOLKATA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	DEEPENING OF CHANNEL /BERTHS. ETC									
	SUB TOTAL (A)									
B.	CONSTRUCTION/DEVELOPMENT OF BERTHS/JETTIES, ETC									
1	Development of Container Handling Jetties at Diamond harbour Container Terminal	10.00	Containers	1253.38	0.00	0.00	0.00	1253.38	2012-13	2016-17
2	Development of full-fledged Cargo handling Facilities at Saugor	6.00	Multi cargo	300.00	0.00	0.00	0.00	300.00	2012-13	2016-17
	TOTAL (B)	16.00		1553.38	0.00	0.00	0.00	1553.38		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KOLKATA DOCK SYSTEM UNDER KOLKATA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
C.	PROCUREMENT OF EQUIPMENT/CRAFT ETC.									
	SUB TOTAL (C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KOLKATA DOCK SYSTEM UNDER KOLKATA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
D.	RAIL/ROAD CONNECTIVITY WORKS									
1	Infrastructure including rail-link and allied logistics for the proposed Diamond Harbour Container Terminal			23.00	23.00	0.00	0.00	0.00	2013-14	2015-16
2	Construction of a rail link (around 35 Km) from Kakdwip to the proposed port facility at Saugar including the Rail-cum-Road overbridge of 4.5 km from Lot no 8 (Harwood Point) to Kachuberia (A/C KDS)			1000.00	0.00	0.00	0.00	1000.00	2012-13	2016-17
	SUB TOTAL (D)	0.00		1023.00	23.00	0.00	0.00	1000.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KOLKATA DOCK SYSTEM UNDER KOLKATA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
E.	OTHER WORKS									
1	Development, Refurbishment & Reconditioning of Civic facilities and allied Infrastructure in and around dock areas at KDS	0.50		13.44	13.44	0.00	0.00	0.00	2012-13	2016-17
2	Infrastructure Upgradation and Allied Works in and around Dock Area at KDS in 11th & 12th Plan			36.47	36.47	0.00	0.00	0.00	2012-13	2016-17
3	Comprehensive Modernisation/Refurbishment of Lock & Allied Machinery/System			1.00	1.00	0.00	0.00	0.00	2012-13	2016-17
	SUB TOTAL (E)	0.50		50.91	50.91	0.00	0.00	0.00		
	GRAND TOTAL	16.50		2627.29	73.91	0.00	0.00	2553.38		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

HALDIA DOCK COMPLEX

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
A.	DEEPENING OF CHANNEL /BERTHS. ETC									
	SUB TOTAL (A)									
B.	CONSTRUCTION/DEVELOPMENT OF BERTHS/JETTIES, ETC									
1	Construction of Outer Terminal 1 Note: Schemes under 1 and 2 are operationally linked.	4.50		270.00	0.00	0.00	0.00	270.00	2012-13	2014-15
2	Construction of Outer Terminal 2	2.50		35.22	35.22	0.00	0.00	0.00	2012-13	2014-15
3	Development of New Port Project at Haldia Dock II	7.40		831.56	39.33	0.00	0.00	792.23	2012-13	2014-15
4	Construction of 4 Riverine Barge Jetty	3.00		45.00	45.00	0.00	0.00	0.00	2012-13	2014-15
	SUB TOTAL (B)	17.40		1181.78	119.55	0.00	0.00	1062.23		
C.	PROCUREMENT OF EQUIPMENT/CRAFT ETC.									
1	Equip & Mech. Of berths	2.00		100.00	100.00				2012-13	2014-15
	SUB TOTAL (C)	2.00		100.00	100.00	0.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

HALDIA DOCK COMPLEX

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
D.	RAIL/ROAD CONNECTIVITY WORKS									
	SUB TOTAL (D)	0.00		0.00	0.00	0.00	0.00	0.00		
E.	OTHER WORKS									
1	Augmentation/upgradation of Railway yard and facilities			30.00	30.00	0.00	0.00	0.00	2012-13	2016-17
2	Procurement of 2 stacker cum reclaimers	1.00		35.00	35.00				2012-13	2014-15
3	3. Acquisition of land and creation of facilities for shore disposal			10.00	10.00				2012-13	2016-17
4	4. Development & Upgradation of stack, drainage, road and other infrastructure			30.00	30.00	0.00	0.00	0.00	2012-13	2016-17
5	4. Augmentation of IT infrastructure			13.50	13.50	0.00	0.00	0.00	2012-13	2016-17
	SUB TOTAL (E)	1.00		118.50	118.50	0.00	0.00	0.00		
	GRAND TOTAL	20.40		1400.28	338.05	0.00	0.00	1062.23		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

RIVER REGULATORY WORKS UNDER KOLKATA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
A.	DEEPENING OF CHANNEL /BERTHS. ETC									
1	River Regulatory Works for improvement of draft in Hooghly Estuary			1020.22	0.00	1020.22	0.00	0.00	2012-13	2016-17
						Grant in Aid			2012-13	2016-17
	TOTAL (A)			1020.22	0.00	1020.22	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

PARADIP PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A. Deepening of Channels, Berths etc.										
1	Enhancement of draught at existing dock system from 12.5 m to 14.0 m to cater Panamax vessels			40.00	10.00	30.00	0.00	0.00	Aug-2011	April-2012
2	Deepening of Channer Ph-II			98.80	35.80	63.00	0.00	0.00		
Sub Total (A)				138.80	45.80	93.00	0.00	0.00		
B. Construction / Reconstruction of Berths and Jetties etc										
1	Construction of Deep Draught iron ore Berths on BOT basis at Paradip Port	10.00	Iron Ore	591.35	52.63	0.00	0.00	538.72	Dec-2011	March-2014
2	Construction of Deep Draught coal Berth on BOT basis at Paradip Port	10.00	Coal	479.01	52.63	0.00	0.00	426.38	Dec-2011	March-2014
3	Construction of Multipurpose berth to handle clean cargo including container on BOT basis	5.00	Containers & other cargo	387.31	58.20	0.00	0.00	329.11	June-2012	Dec-2014
4	Construction of Southern Oil Jetty at Paradip Port	10.00	POL	191.09	65.21	0.00	125.88	0.00	June-2012	March-2014

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

PARADIP PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
5	Construction of Western Dock on BOT basis at Paradip Port Ph I	5.00	Coal	185.58	30.00	0.00	0.00	155.58	April-2015	March-2017
Sub Total (B)		40.00		1834.34	258.67	0.00	125.88	1449.79		
C.	PROCUREMENT OF EQUIPMENT /CRAFT ETC.									
Sub Total (C)		0.00		0.00	0.00	0.00	0.00	0.00		
D.	Rail Road Connectivity works									
Sub Total (D)		0.00		0.00	0.00	0.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

PARADIP PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
E.	Other Misc. works									
1	Installation of dust suppression system (DSS) at OHP and MCHP			4.22	4.22				Dec-2010	Aril-2012
2	Shifting of CISF Complex			2.51	2.51				June-2008	June-2012
3	Consruction of Modern auditorium at Paradip Port			2.70	2.70				June-2010	Dec-2012
4	Enhancement of contract demand from 16 MVA to 30 MVA			6.00	6.00				July-2010	March-2014
5	Shifting of existing 33/11 KV control room at Alharabanki & 33 KV Power supply to BOT terminals			14.51	14.51				May-2011	Jan-2013
6	Integrated port information			9.85	9.85				April-2013	May-2014
7	Shore Protection Work			40.00	40.00				Jan-2014	Dec-2014
8	Construction of water treatment plant			30.00	30.00				Jan-2015	Dec-2016
9	Other Misc. works			80.00	80.00				April-2015	March-2017
	Sub Total (E)	0.00		189.79	189.79	0.00	0.00	0.00		
	Grand Total	40.00		2162.93	494.26	93.00	125.88	1449.79		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISAKHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	Deepening of channels , berths etc.									
1	Phase II - Deepening of Inner harbour entrance channel and turning circle draft from 11.0 m to 12.5 m			70.00	70.00	0.00	0.00	0.00	Aug-2010	Oct-2011
2	Phase III Deepening the entrance channel and turning circle from draft of 12.5 m to 14 m Inner Harbour			280.04	280.04	0.00	0.00	0.00	Dec-2011	Dec-2012
3	Outer Harbour expansion project (Capital Dredging portion) upto 18.1 mtrs.draft.			119.87	119.87	0.00	0.00	0.00	Dec-2011	Feb-2013
4	Development of Satellite port at Bhimuniapatnam including new Fishing Harbour - Capital Dredging portion.	---		200.00	200.00	0.00	0.00	0.00	April-2015	June-2016
5	Expansion of Outer harbour - Dredging/ Channel development etc.	---		200.00	200.00	0.00	0.00	0.00	June-2012	Dec-2016
	Sub total (A)	0.00		869.91	869.91	0.00	0.00	0.00		
B.	Construction / Reconstruction of berths and jetties etc.									
1	Additional Oil handling facilities for POL	2.00	POL	183.00	183.00	0.00	0.00	0.00	2012-13	2014-15

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISAKHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
2	Outer harbour expansion project	6.50	Iron ore	211.00	0.00	0.00	0.00	211.00	Dec-2011	Dec-2014
3	Development of WQ7 berth in the Inner Harbour including mechanised handling facilities for handling Dry Bulk cargoes (DBFOT basis)	5.11	Dry bulk (import)	201.00	0.00	0.00	0.00	201.00	Dec-2011	Dec-2013
4	Development of WQ 8 Berth in the Inner Harbour including mechanised handling facilities on (DBFOT basis)	2.00	Dry/Break bulk	134.00	0.00	0.00	0.00	134.00	Dec-2012	Dec-2014
5	Development of WQ6 berth in the Inner harbour for Multi cargos	2.08	Multi cargo	114.50	0.00	0.00	0.00	114.50	Oct-2011	Oct-2013
6	Construction of EQ 10 berth in Inner harbour for Liquid cargo	1.85	Liquid cargo	55.38	0.00	0.00	0.00	55.38	Nov-2011	Nov-2013
7	Strengthening of EQ 7, WQ4&WQ5 berths to cater to 12.5 mtrs draft vessels	0.50	Multi cargo	18.00	18.00	0.00	0.00	0.00	Sept-2012	March-2014

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISA KHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
8	Development of EQ1A on South side of EQ1 in Inner Harbour on DBFOT basis	7.36	Thermal/steam coal	313.39	0.00	0.00	0.00	313.39	Dec-2011	Dec-2013
9	Development of EQ1 berth on South of East Quay and replacement of EQ2 berth in inner harbour on DBFOT basis.	4.70	Steam coal	237.35	0.00	0.00	0.00	237.35	Dec-2011	Dec-2013
10	Extension of container terminal and augmentation of capacity of existing terminal	3.50	Containers	130.00	0.00	0.00	0.00	130.00	April-2014	March-2016

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISAKHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
11	Replacment of existing berths in the inner harbour/ Development of Jetties / Berths.	5.00	Coal	1000.00	0.00	0.00	0.00	1000.00	March-2013	March-2017
	Sub total (B)	40.60		2597.62	201.00	0.00	0.00	2396.62		
C.	Procurement of equipments / crafts etc.									
1	Installation of Mechanised facilities at WQ1 berth in inner harbour for handling Iron ore on DBFOT basis	6.13	Iron ore	187.86	0.00	0.00	0.00	187.86	Jan-2012	Jan-2014

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISAKHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
2	Installation of Mechanised fertiliser handling facilities at EQ7 berth in the Inner Harbour on DBFOT basis	3.33	Finished fertilizers	139.07	0.00	0.00	0.00	139.07	Jan-2012	Jan-2014
3	Mechanization of cargo handling facilities and up-gradation of GCB in the outer harbour of Visakhapatnam Port to cater 200000 DWT vessels on DBFOT Basis	5.54	Coal	222.05	0.00	0.00	0.00	222.05	Dec-2010	Dec-2012
	Sub total (C)	15.00		548.98	0.00	0.00	0.00	548.98		
D.	Rail road connectivity works									
1	Port connectivity road - Phase-1			165.00	165.00	0.00	0.00	0.00	2012-13	2017-18
2	(As Joint Venture with NHAI)			55.00	55.00	0.00	0.00	0.00	2012-13	2017-18
3	Improvement to road infrastructure with road bridges/fly over bridges-Phase II			81.00	81.00	0.00	0.00	0.00	2012-13	2017-18

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISAKHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
4	Improvement to road infrastructure with road bridges.fly over bridges Phase III			160.00	160.00	0.00	0.00	0.00	2012-13	2017-18
5	Modernisation of Railway siding facilities			25.00	25.00	0.00	0.00	0.00	2008-09	Dec-2012
6	Modernization and development of railway system			100.00	100.00	0.00	0.00	0.00	April-2014	March-2017
7	Development of new road connectivities			50.00	50.00	0.00	0.00	0.00	April-2015	March-2017
8	Development of Railway sidings			40.00	40.00	0.00	0.00	0.00	2013-14	2017-18
9	Development of roads & culverts			50.00	50.00	0.00	0.00	0.00	2013-14	2017-18
	Sub Total (D)	0		726.00	726.00	0.00	0.00	0.00		
E.	Other works									
1	Acquisition of land for construction of quarters			18.00	18.00	0.00	0.00	0.00	Dec-2011	Dec-2011
2	Acquisition of land adjacent to outer harbour (Land acquisition at Kotaveedhi OH) fs			20.00	20.00	0.00	0.00	0.00	2012-13	2015-16
3	Environmental upgradation schemes			38.00	38.00	0.00	0.00	0.00	April-2012	March-2017
4	Development of Multi model logistics Hub			160.00	40.00	0.00	0.00	120.00	2012-13	2014-15

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

VISAKHAPATNAM PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
5	Productivity Improvement measures			10.00	10.00	0.00	0.00	0.00	2012-13	2013-14
6	Development of stacking space in place of Existing fishing harbour			20.00	20.00	0.00	0.00	0.00	June-2013	Dec-2016
7	Acquisition of land adjacent to outer harbour - Phase-II (Land acquisition at I town area)			50.00	0.00	0.00	0.00	50.00	Sept-2015	March-2017
8	Construction of multi-stored building to house trade center			25.00	25.00	0.00	0.00	0.00	Jan-2016	March-2018
9	Construction of open storage sheds / warehouses in port areas.			50.00	0.00	0.00	0.00	50.00	Sept-2012	Jan-2014
10	Development of stacking space in Port Area Phase.II			10.00	10.00	0.00	0.00	0.00	April-2012	March-2013
11	Upgradation of Environmental schemes Phase-III			50.00	50.00	0.00	0.00	0.00	April-2012	March-2017
12	Upgradation of existing infrastructural facilities (for all assets)			100.00	0.00	0.00	0.00	100.00	April-2012	March-2017
13	Upgradation of ORS & dry dock			100.00	0.00	0.00	0.00	100.00	April-2015	Dec-2016
14	Information technology phase-III			10.00	10.00	0.00	0.00	0.00	April-2012	March-2017
	Sub total (E)	0.00	0.00	661.00	241.00	0.00	0.00	420.00		
	Grand Total	55.60	0.00	5403.51	2037.91	0.00	0.00	3365.60		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

ENNORE PORT LIMITED

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	DEEPENING OF CHANNEL/BERTHS ETC.									
1	Capital Dredging - Phase-II	6.00	Ironore	200.00	0.00	170.00	30.00	0.00	26-02-2011	31-07-2012
2	Capital Dredging - Phase-III	18.00	Container	220.00	0.00	220.00	0.00	0.00	2013-14	2015-16
3	Capital Dredging - Phase - IV		Coal	80.00	0.00	80.00	0.00	0.00	2013-14	2015-16
4	Capital Dredging - Phase - V	5.00	LNG	100.00	0.00	100.00	0.00	0.00	2013-14	2015-16
	SUB TOTAL (A)	29.00		600.00	0.00	570.00	30.00	0.00		
B.	Construction / Resonsturction of Berths & Jetties									
1	Coal Berth III	9.00	Coal	100.00	0.00	0.00	0.00	100.00	2012-13	2013-14
2	Coal Berth IV	9.00	Coal	100.00	70.00	0.00	0.00	30.00	2014-15	2015-16
	SUB TOTAL (B)	18.00		200.00	70.00	0.00	0.00	130.00		
C.	Procurement of equipment / crafts etc									
	N I L									

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

ENNORE PORT LIMITED

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
D.	Rail / Road connectivity works									
1	Rail connectivity to iron Ore and Coal Stackyards			80.00	0.00	0.00	80.00	0.00	2012-13	2015-16
2	Rail road connectivity to container terminal			40.00	20.00	0.00	20.00	0.00	2012-13	2015-16
3	New BG line between Puthur and Attipatthu - Equity Contribution			300.00	50.00	0.00	250.00	0.00	2012-13	2015-16
4	Four laning of TPP road			34.00	34.00	0.00	0.00	0.00	2012-13	2016-17
5	Northern Port access road and other internal roads			100.00	100.00	0.00	0.00	0.00	2012-13	2016-17
	SUB TOTAL (D)	0.00		554.00	204.00	0.00	350.00	0.00		
E.	Other works									
1	Land cost (Purchase of Salt Department (Land)			452.00	202.00	0.00	250.00	0.00	2014-15	2016-17
2	ECPP Payment			200.00	0.00	0.00	200.00	0.00	2012-13	2016-17
	SUB TOTAL (E)	0.00		652.00	202.00	0.00	450.00	0.00		
	GRAND TOTAL	47.00		2006.00	476.00	570.00	830.00	130.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

CHENNAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	DEEPENING OF CHANNELS /BERTHS									
1	Deepening of Channel Basin Berths (Spilover)	7.00	General Cargo	143.00	70.00	73.00	0.00	0.00	2012-13	2015-16
	Sub Total (A)	7.00		143.00	70.00	73.00	0.00	0.00		
B.	CONSTRUCTION / RECONSTRUCTION OF BERTHS/JETTIES etc									
1	Creation of Mega Container Terminal to the north of the Bharathi Dock under PPP mode (spil over)	24.00	Container	1843.00	280.50	0.00	0.00	1562.50	2012-13	2016-17
2	Development of (Ro-Ro) cum multi purpose berth and multi level car parking in Bharathi Dock under PPP Mode	1.00	Automobile	100.00	0.20	0.00	0.00	99.80	2012-13	2016-17
3	Development of Barge handling facilities at Chennai Port under PPP mode (spil over)	1.00	Liquid	40.00	0.25	0.00	0.00	39.75	2012-13	2016-17

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

CHENNAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
4	Construction of 200 M berth at Western side of Boat Basin on BOT basis	1.00	General Cargo	50.00	1.00	0.00	0.00	49.00	2012-13	2016-17
Sub Total (B)		27.00		2033.00	281.95	0.00	0.00	1751.05		
C.	RAIL/ROAD CONNECTIVITY WORKS									
1	Elevated 4 lane link road from Chennai Port and NH4 at Maduravoyal (BOT) contribution towards LA & RR by Ch.PT Rs. 155/235 crs			1655.00	154.09	0.00	1500.91	0.00	2007-08	2012-13
2	Ennore - Manali Expressway formation of special purpose vehicle			600.00	72.80	0.00	527.20	0.00	2007-08	2012-13
Sub Total (C)		0.00		2255.00	226.89	0.00	2028.11	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

CHENNAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
D.	OTHER WORKS									
1	Development of additional open storage yard (spillover)			6.00	6.00	0.00	0.00	0.00	2012-13	2016-17
2	Modernization of Chennai Port - Staggge-I			13.00	13.00	0.00	0.00	0.00	2012-13	2016-17
3	Creation of additional open storage yard by reclamation of 7.8 hectare of land at East of EQ			15.50	15.50	0.00	0.00	0.00	2012-13	2016-17
4	construction of Marena	1.00		355.20	2.50	0.00	0.00	352.70	2012-13	2016-17
5	construction of groyne field South of sand screen			15.00	15.00	0.00	0.00		2012-13	2016-17
6	Development of Rajiv Gandhi dry port Development of Shri Rajiv Gandhi Dry Port and Multi Modal Logistics Hub near Sriperumpudur (PPP Projects) (spillover)			272.50	42.50	0.00	0.00	230.00	2012-13	2016-17
7	Construction of 200 bed hospital at THC on PPP modes			40.00	0.50	0.00	0.00	39.50	2012-13	2016-17

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

CHENNAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
8	Construction of Commercial complex at North of super speciality hospital			25.00	25.00	0.00	0.00		2012-13	2016-17
9	Development of slipway complex at Timber pond under PPP mode (New Scheme)			40.00	0.50	0.00	0.00	39.50	2012-13	2016-17
10	Providing concrete road along with shore protection works from surag agro to south tanker of old entrance			18.00	18.00	0.00	0.00	0.00	2012-13	2016-17
11	Construction of Shopping Mal at THC on PPP mode (New Scheme)			25.50	0.50	0.00	0.00	25.00	2012-13	2016-17
12	Construction of Transhi Guesthouse service Studio Apartments at Ports Land in near Airport on PPP Mode (New Scheme)			10.00	0.50	0.00	0.00	9.50	2012-13	2016-17
SUB TOTAL (D)		1.00		835.70	139.50	0.00	0.00	696.20		
GRAND TOTAL		35.00		5266.70	718.34	73.00	2028.11	2447.25		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

V.O. CHIDAMBARNAR PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	DEEPENING OF CHANNELS, BERTHS ETC									
1	Dredging in front of North Cargo Berth-II			285.00	145.00	0.00	140.00	0.00	12-08-2010	May-2012
2	Dredging in front of Shallow Water Berth-I&II			264.00	132.00	0.00	132.00	0.00	2013-14	2016-17
3	Dredging in front of North Cargo Berth-III			264.00	132.00	0.00	132.00	0.00	2014-15	2016-17
4	Dredging in front of North Cargo Berth-IV			264.00	132.00	0.00	132.00	0.00	2014-15	2015-16
5	Dredging the channel and basin at outer harbour			997.00	50.00	0.00	947.00	0.00	2015-16	2017-18
6	Dredging in front of shallow Water Berth-III,IV,V,VI & VII			694.00	380.00	0.00	314.00	0.00	2011-12	June-2013
	SUB-TOTAL (A)	0.00		2768.00	971.00	0.00	1797.00	0.00		
B.	CONSTRUCTION/ RECONSTRUCTION OF BERTH & JETTIES ETC									
1	Conversion of berth no.8 as container terminal	7.20		312.23	0.00	0.00	0.00	312.23	Sept-2011	Nov-2013
2	Structural Upgradation of Coal jetty-	4.40		9.70	9.70				2012-13	2014-15
3	Construction of shallow water berth for handling construction materials	2.00		65.37	0.00	0.00	0.00	65.37	March-2012	April-2014
4	shallow water berth for handling cement	2.30		86.17	0.00	0.00	0.00	86.17	Nov-2011	Dec-2013
5	Construction of North Cargo Berth-II	7.00		332.16	0.00	0.00	0.00	332.16	Dec-2011	Dec-2013
6	Construction of North Cargo Berth-III & IV	7.00		420.00	0.00	0.00	0.00	420.00	Dec-2011	Dec-2013

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

V.O. CHIDAMBARNAR PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
7	Construction of shallow berth III,IV,V,VI&VII	10.00		400.00	0.00	0.00	0.00	400.00	2014-15	2016-17
SUB-TOTAL (B)		39.90		1625.63	9.70	0.00	0.00	1615.93		
C.	PROCUREMENT OF EQUIPEMENT/CRAFT ETC									
1	Upgradation of Mechanical Infrastructure Berth I to IV and Berth-9	8.30		80.10	0.00	0.00	0.00	80.10	2013-14	2014-15
SUB-TOTAL (C)		8.30		80.10	0.00	0.00	0.00	80.10		
D.	RAIL / ROAD CONNECTIVITY WORKS									
1	Providing railway track between marshalling yard and Hare Island			40.00	40.00	0.00	0.00	0.00	2013-14	2014-15
2	Providing a new railway line between 7 & 8 berths			10.00	10.00	0.00	0.00	0.00	2013-14	2014-15

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

V.O. CHIDAMBARNAR PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
3	Modernisation of railway track with in Port limit			7.00	7.00	0.00	0.00	0.00	2013-14	2014-15
4	Development of container truck parking terminal, PFS and elevated express way between truck parking terminal to 7th berth			150.00		0.00	0.00	150.00	2012-13	2013-14
SUB-TOTAL (D)		0.00		207.00	57.00	0.00	0.00	150.00		
E.	OTHER WORKS									
1	Usage of Information Technology			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
2	Auxiliary facilities			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
3	Upgradation of Port Electrical system			17.00	17.00	0.00	0.00	0.00	2012-13	2016-17
4	Conversion of HT/LT			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
5	Reclamation of heavy duty pavement			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
6	3MVA Captive Power plant/ wind mill			40.00	40.00	0.00	0.00	0.00	2012-13	2016-17
7	Free Trade Warehousing Zone			1.00	1.00	0.00	0.00	0.00	2012-13	2016-17
8	Food Processing Park			10.00	0.00	0.00	0.00	10.00	2012-13	2016-17
9	Special Economic Zone			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
10	Development and outsourcing of warehoused in Zone-B			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
11	Integrated drainage system in port area			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17

Annexure 6.2 (i)

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

V.O. CHIDAMBARNAR PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
12	Installation of VTMS			10.00	10.00				2012-13	2016-17
13	Providing sea wall to prevent erosion at Hare Island			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
14	Decongestion Plan Phase-I			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
15	Shifting of Signal station			10.00	10.00	0.00	0.00	0.00	2012-13	2016-17
16	Construction of new nine storied administration block			30.00	30.00	0.00	0.00	0.00	2012-13	2016-17
17	Construction of Ship build yard			1500.00	0.00	0.00	0.00	1500.00	2012-13	2016-17
	SUB-TOTAL (E)	0.00		1708.00	198.00	0.00	0.00	1510.00		
	GRAND TOTAL	48.20		6388.73	1235.70	0.00	1797.00	3356.03		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

COCHIN PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
A.	Deepening of Channels, berths etc.									
1	Capital Dredging for creation of Berth Basin for ICTT -									
(a)	Phase-III for extending the length of basin for 300m			40.00	0.00	40.00	0.00	0.00	2013	2014
(b)	Phase-IV for extending the length of 900m			120.00	0.00	120.00	0.00	0.00	2014	2017
2	Deepening of EKM channel- Q5 to Q7 frontage			35.00	35.00	0.00	0.00	0.00	2015	2017
3	Deepening of Mattancherry Channel			50.00	0.00	50.00	0.00	0.00	2016	2017
	Sub total (A)	0.00		245.00	35.00	210.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

COCHIN PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	ERR& Others	Pvt. Sector		
					(RS. IN CRORES)					
B.	Construction/ Reconstruction of berths and jetties etc.									
1	LNG Regasification Terminal - Phase-II	2.50	LNG	360.00	0.00	0.00	0.00	360.00	11th Plan	2012
(a)	Phase IB for Extension of berth by 300m and providing related facilities	6.25	Container	250.00	0.00	0.00	0.00	250.00	2012	2013
2	Bunkering Terminal (Multi User Liquid Terminal)	4.10	LPG, Bunkers & POL	207.00	0.00	0.00	0.00	207.00	2011	2013

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

COCHIN PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
3	Liquid cargo jetty in M/channel	2.00	POL	50.00	0.00	0.00	0.00	50.00	2015	2016
4	Strengthening of Q5 to Q7 berths of E/wharf	1.00	GC	50.00	0.00	0.00	0.00	50.00	2015	2017
5	Reconstruction of Mattancherry wharf Phase-II	1.00	Coal & Misc.	120.00	0.00	0.00	0.00	120.00	2015	2017
Sub total (B)		16.85		1037.00	0.00	0.00	0.00	1037.00		
C.	Procurement of Equipments/Crafts etc									
1	Procurement of remaining cargo handling Equipments		Bulk	150.00	0.00	0.00	0.00	150.00	2012	2017
Sub total (C)		0.00		150.00	0.00	0.00	0.00	150.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

COCHIN PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
D.	Rail / road connectivity works									
1	Widening to four lane and strengthening of NH 47A			40.00	0.00	0.00	40.00	0.00	2015	2017
	Sub total (D)	0.00		40.00	0.00	0.00	40.00	0.00		
E.	Other works									
1	Development of business district/SEZ/Shipyard/other projects at south end reclamation area at W/Island as per Master Plan			100.00	0.00	0.00	0.00	100.00	2015	2018
2	Land development at PBSEZs			25.00	25.00	0.00	0.00	0.00	2012	2015
3	Construction of Administrative. commercial offices and related establishment cost at PBSEZs			20.00	4.00	0.00	0.00	16.00	2012	2017

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

COCHIN PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
4	Providing Common Infrastructure like Road, Drainage, Water Supply Arrangements, Power, Fencing, Gate complex etc.			75.00	15.00	0.00	0.00	60.00	2012	2017
5	Disaster management for development schemes			5.00	5.00	0.00	0.00	0.00	2012	2017
6	Integrated Truck Parking terminal			5.00	0.00	0.00	0.00	5.00	2013	2015
7	Development of Port Hospital			10.00	10.00	0.00	0.00	0.00	2013	2017
8	Feasibility studies for Port Development schemes			3.00	3.00	0.00	0.00	0.00	2012	2017
Sub total (E)		0.00		243.00	62.00	0.00	0.00	181.00		
Grand Total		16.85		1715.00	97.00	210.00	40.00	1368.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

NEW MANGALORE PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	DEEPENING OF CHANNELS, BERTHS ETC									
1	Capital Dredging for deepening the channel and lagoon			390.00	60.00	330.00	0.00	0.00	2012	2017
	SUB-TOTAL (A)	0.00		390.00	60.00	330.00	0.00	0.00		
B.	CONSTRUCTION/ RECONSTRUCTION OF BERTH & JETTIES ETC									
1	Construction of POL berth No.13	7.80	POL	79.17	79.17	0.00	0.00	0.00	Feb-2011	Oct-2012
2	SPM for POL	9.00	POL	425.00	0.00	0.00	0.00	425.00	2013	2015
3	Construction of container terminal at NMPT	4.50	Containers	269.73	0.00	0.00	0.00	269.73	2011	2013
4	Coal handling berth at Western dock arm	6.00	Coal	147.00	147.00	0.00	0.00	0.00	2013	2015
5	Mechanized iron ore handling at berth No.14	6.62	Iron ore	296.03	0.00	0.00	0.00	296.03	2010	2012
	SUB-TOTAL (B)	33.92		1216.93	226.17	0.00	0.00	990.76		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

NEW MANGALORE PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
C.	PROCUREMENT OF EQUIPEMENT/CRAFT ETC									
	SUB-TOTAL (C)	0.00		0.00	0.00	0.00	0.00	0.00		
D.	RAIL ROAD CONNECTIVITY WORKS									
1	Improvement to port internal roads			50.00	50.00	0.00	0.00	0.00	2014-15	2016-17
2	Improvement of Railway Marshalling yard			10.00	10.00	0.00	0.00	0.00	2014-15	2016-17
	SUB-TOTAL (D)	0.00		60.00	60.00	0.00	0.00	0.00		
E.	OTHER WORKS									
1	Construction of new warehouses			10.00	10.00	0.00	0.00	0.00	2012-13	2013-14
2	Construction of TPC at Bangalore			5.00	5.00	0.00	0.00	0.00	2012-13	2013-14
	SUB-TOTAL (E)	0.00		15.00	15.00	0.00	0.00	0.00		
	GRAND TOTAL	33.92		1681.93	361.17	330.00	0.00	990.76		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

MORMUGAO PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	Deepening of channels, berths etc.									
1	Capital dredging for deepening of channel and berths from (-) 14.4 to (-)17.4 m below CD	2.00	--	600.00	0.00	600.00	0.00	0.00	April-2013	Feb-2015
2	Capital dredging along side breakwater Berth	--	--	15.00	15.00	0.00	0.00	0.00	Oct-2011	May-2012
	Sub Total (A)	2.00		615.00	15.00	600.00	0.00	0.00		
B.	Construction /Reconstruction of berths and jetties etc.									
1	Development of west of breakwater (WOB)	7.20	Iron Ore	721.00	0.00	0.00	0.00	721.00	Oct-2011	Sept-2015
2	Development of berth no. 7 (PPP)	4.61	Coal	406.00	0.00	0.00	0.00	406.00	May-2010	May-2013
3	Development of Vasco Bay	5.00	General Cargo	120.00	0.00	0.00	0.00	120.00	Oct-2014	March-2017
4	Development of a 4 MMTPA Coal Import Terminal at Berth No.11 at Mormugao Port	4.00	Coal	355.30	0.00	0.00	0.00	355.30		
5	Uptopping of breakwater and additional mooring dolphins	2.00	Iron Ore	150.00	0.00	150.00	0.00	0.00	Sept-2015	Feb-2017
	Sub Total (B)	22.81		1752.30	0.00	150.00	0.00	1602.30		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

MORMUGAO PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
C.	Procurement of equipments/crafts etc.									
1	Development of 12MMTPA Iron Ore Export Terminal at Berth no. 7	6.00	Iron Ore	315.00	0.00	0.00	0.00	315.00	Oct-2012	March-2015
	Sub Total (C)	6.00		315.00	0.00	0.00	0.00	315.00		
D.	Rail road connectivity works									
1	Four Lane road connectivity from NH 17	--	--	145.00	65.00	0.00	80.00	0.00	Oct-2009	Feb-2015
2	Internal Road improvement including flyover	--	--	50.00	50.00	0.00	0.00	0.00	Sept-2012	Feb-2015
	Sub Total (D)	0.00		195.00	115.00	0.00	80.00	0.00		
E.	Other works									
1	Remodelling & Upgradation of existing railway yards at Harbour including other allied works	--	--	20.00	20.00	0.00	0.00	0.00	Oct-2011	Nov-2012
2	Construction of Building near Light House at Breakwater	--	--	10.00	0.00	0.00	10.00	0.00	April-2012	March-2013
3	Tier - 1 Oil Spill Contingency	--	--	3.00	3.00	0.00	0.00	0.00	July-2012	June-2013
	Sub Total (E)	0.00		33.00	23.00	0.00	10.00	0.00		
	Grand Total	30.81		2910.30	153.00	750.00	90.00	1917.30		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
A.	DEEPENING OF CHANNEL:									
1	Deepening and widening of Approach			1300.00	1300.00	0.00	0.00	0.00	2011	2014
2	channel to JNP. Phase I									
	SUB TOTAL (A)	0.00		1300.00	1300.00	0.00	0.00	0.00		
B.	CONSTRUCTION/ RECONSTRUCTION OF BERTHS AND JETTIES ETC.									
1	Extention of container berth by 330 m and other facilities	10.00	Container	600.00	0.00	0.00	0.00	600.00	2011	2013
2	Construction of 4th terminal PH-I/II	70.00	Container	6700.00	0.00	0.00	0.00	6700.00	2011	2017
3	Construction of Marine Chemical Terminal	6.00	Liquid bulk	1000.00	0.00	0.00	0.00	1000.00	2011	2017
	SUB TOTAL (B)	86.00		8300.00	0.00	0.00	0.00	8300.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

JAWAHARLAL NEHRU PORT TRUST										
Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
C.	PROCUREMENT OF EQUIPMENT/CRAFT ETC.									
1	Acquisition Of 3 nos new Super Post panamax size RMQCs/Replacement of existing 2 nos. RMQCs acquired in 1989	1.87	Container	111.00	111.00	0.00	0.00	0.00	2011	2013
2	Acquisition of one no. new Super Post Panamax size RMQC at MCB and shifting of existing one no. RMQC to SDB	1.87	Container	40.00	40.00	0.00	0.00	0.00	2011	2013
	SUB TOTAL (C)	3.74		151.00	151.00	0.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
D.	RAIL AND ROAD INFRASTRUCTURE									
1	Railway infrastructure facilities in Port area.			25.00	25.00	0.00	0.00		2011	2014
2	Construction of grade separator at Karal and Gavhan Junction									
(I)	Karal Junction			434.00	0.00	0.00	434.00	0.00	To be taken up by NHAI on BOT basis	
(II)	Gavhan Junction			0.00	0.00	0.00	0.00	0.00		
3	Hinterland road connectivity to Port.			200.00	0.00	0.00	200.00	0.00	To be taken up by NHAI on BOT basis	
4	Upgradation of existing roads and yards in JNPT			85.00	85.00	0.00	0.00	0.00	2007	2017
5	Eight lining of NH4B & SH54			400.00	0.00	0.00	400.00	0.00	To be taken up by NHAI on BOT basis	

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
6	Alternate of road connectivity to JN Port			210.00	0.00	0.00	210.00	0.00	To be taken up by NHAI on BOT basis	
7	Construction of second link road to JN Port			140.00	0.00	0.00	140.00	0.00	To be taken up by NHAI on BOT basis	
8	Construction of new ROBs within Port limit			70.00	70.00	0.00	0.00	0.00	2014	2020
9	Other infrastructure works in zone V (Roads for the 4th Terminal)			25.00	25.00	0.00	0.00	0.00		
10	Construction of inter changes in Port Area			15.00	15.00	0.00	0.00	0.00	2014	2020
11	Development of second evacuation road			45.00	45.00	0.00	0.00	0.00	2014	2017
12	Development of road connectivity to the proposed terminals at Nhava									
SUB TOTAL (D)		0.00		1649.00	265.00	0.00	1384.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
E.	OTHER WORKS									
1	Port security works as per ISPS code.			10.00	10.00	0.00	0.00	0.00		
2	Rehabilitation measures			250.00	250.00	0.00	0.00	0.00	2004	2016
3	Environmental measure for infrastructure development of Port base industries.			18.00	18.00	0.00	0.00	0.00	2006	2016
4	Other infrastructure works in zone II			8.00	8.00	0.00	0.00	0.00	2004	2016
5	Parking Plaza			117.00	15.00	0.00	0.00	102.00	2012	2015
6	Reclamation of Plot area in zone V			25.00	25.00	0.00	0.00	0.00		
7	Development of waste disposal system in JN Port area			8.00	8.00	0.00	0.00	0.00	2012	2017

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
8	Augmentation to water supply and sewerage scheme from Zone I to V			25.00	25.00	0.00	0.00	0.00	2012	2017
9	Other infrastructure works in zone I					0.00				
10	Other infrastructure works in zone V			35.00	35.00	0.00	0.00	0.00	2012	2017
11	Upgradation of computer systems			9.00	9.00	0.00	0.00	0.00	2012	2013
12	Rehabilitation of existing structures at JN Port Township			40.00	40.00	0.00	0.00	0.00	2012	2015
13	Captive Power plant			350.00	350.00	0.00	0.00	0.00	2012	2014

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

JAWAHARLAL NEHRU PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
14	Main project for Nhava Sheva Port.			0.05	0.05	0.00	0.00	0.00		
15	Provision of compensation to salt pan leasees as per Mumbai High Court Judgement			60.00	60.00	0.00	0.00	0.00	Under Litigation	Under Litigation
16	Augmentation of container gate			12.00	12.00	0.00	0.00	0.00	2012	2013
17	Development of Port based SEZ			0.00	0.00	0.00	0.00	0.00		
	Phase I			2000.00	0.00	0.00	0.00	2000.00	2012	2014
	Phase II			7000.00	0.00	0.00	0.00	7000.00	2015	2017
	SUB TOTAL (E)	0.00		9967.05	865.05	0.00	0.00	9102.00		
	GRAND TOTAL	89.74		21367.05	2581.05	0.00	1384.00	17402.00		

Note: The port has reviewed the schemes for the 12th Five Year Plan proposal with respect to the current traffic and status of the schemes and requisite changes are made in the proposal submitted earlier

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

MUMBAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
A.	DEEPENING OF CHANNELS, BERTHS ETC									
1	Deepening of main harbour channel to (-)13.5 m CD including providing anchorages.MbPT's contribution = Rs.121 Cr. For deepening of main channel + MbPT's contribution of Rs.41 Cr.=Rs.162 Cr.			162.00	162.00	0.00	0.00	0.00	Jan-2012	April-2014
	SUB-TOTAL (A)	0.00		162.00	162.00	0.00	0.00	0.00		
B.	CONSTRUCTION / RECONSTRUCTION OF BERTH & JETTIES ETC									
1	Construction of two off shore berths for handling containers at Mumbai Port (0.8 MTEU's)	9.60	Containers	1460.52	320.00	0.00	0.00	1140.52	April-2009	Dec-2012
2	Construction of second berth for handling liquid chemicals/ specialised grades of POL of New Pir pau Pier	2.00	POL	116.00	116.00	0.00	0.00	0.00	July-2012	Sept-2014
3	Dredging & Infrastructure development for handling bigger ships at 18 to 21 ID harbour wall berths	7.00	General Cargo	353.00	353.00	0.00	0.00	0.00	July-2012	Sept-2014

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

MUMBAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
4	Construction of 5th Oil berth at Jawahar Dweep	10.00	POL	375.00	375.00	0.00	0.00	0.00	April-2013	March-2016
5	Upgradation of 4th Oil berth	2.00		50.00	50.00	0.00	0.00	0.00	April-2013	March-2016
8	Development of off shore multipurpose cargo berths	4.00	General Cargo	582.00	22.00	0.00	0.00	560.00	Dec-2013	June-2016
	SUB-TOTAL (B)	34.60		2936.52	1236.00	0.00	0.00	1700.52		
C.	PROCUREMENT OF EQUIPEMENT/CRAFT ETC									
	SUB-TOTAL (C)	0.00		0.00	0.00	0.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

MUMBAI PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
D.	RAIL ROAD CONNECTIVITY WORKS									
1	Improvement to port connectivity improvement of rail & road infrastructure									
	Rail: dedicted goods line from Wadal to Kurla			176.81	176.81	0.00	0.00	0.00	July-2011	Dec-2015
	Road: Concretisation of Roads			40.00	40.00	0.00	0.00	0.00	2005	Oct-2015
	SUB-TOTAL (D)	0.00		216.81	216.81	0.00	0.00	0.00		
E.	OTHER WORKS									
1	Construction of transit sheds at indira dock									
	Shed at 16/17 ID			30.00	30.00	0.00	0.00	0.00	Jan-2013	March-2015
	Shed at 4 ID			10.00	10.00	0.00	0.00	0.00	Jan-2013	March-2015
2	Upgradation of Slipways in MbPT workshop			100.00	100.00	0.00	0.00	0.00	March-2013	Dec-2016
3	Replacement of 14" dia flushing pipeline from Pir Pau to Wadala			10.00	10.00	0.00	0.00	0.00	March-2013	Dec-2015
4	Development of Coastal shipping					0.00	0.00	0.00		
5	Reconstruction of Hay Bunder Quay Wall			10.00	10.00	0.00	0.00	0.00	Dec-2011	June-2013
	SUB-TOTAL (E)	0.00		160.00	160.00	0.00	0.00	0.00		
	GRAND TOTAL	34.60		3475.33	1774.81	0.00	0.00	1700.52		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KANDLA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
A.	Deepening of channel/berths etc.									
1	Deepening of navigational channel in kandla creek			30.00	30.00	0.00	0.00	0.00	March-2015	30.03.2016
2	Deepening of Sogal Channel beyond 13 meters			250.00	250.00	0.00	0.00	0.00	04.01.2015	31.12.2016
3	Capital dredging alongside dry cargo berths and Oil Jetties at Kandla.			55.00	55.00	0.00	0.00	0.00	04.01.2014	31.01.2016
4	Capital dredging of tuna channel and alongside berth for the project of Developing dry bulk terminal off tekra near Tuna (Outside Kandla creek) on BOT basis.			250.00	250.00	0.00	0.00	0.00	01.03.2013	31.03.2016
SUB TOTAL (A)		0.00		585.00	585.00	0.00	0.00	0.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KANDLA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
B.	Construction/Re-construction of berths and jetties									
1	Modification and strengthening of existing cargo berths no. 1 to 6	5.20	Multipurpose dry cargo	252.00	252.00	0.00	0.00	0.00	Sept-2011	March-2014
2	Development of 13 to 16 Multipurpose cargo (other than liquid & container cargo) berths	8.00	Multipurpose dry cargo	615.00	27.00	0.00	0.00	588.00	13th berth-Mar-2011, 14th berth-Mar-2012, 15th & 16th berth-July-2011	13th berth-Mar-2013, 14th berth-Mar-2014, 15th & 16th berth-July-2013
3	Developing dry bulk terminal off tekra near Tuna (outside Kandla Creek) on BOT basis.	14.00	dry bulk cargo	1060.16	242.00	0.00	0.00	818.16	March-2012	March-2014
4	Setting up of Single Point Mooring (SPM) and allied facilities off Veera in Gulf of Kutch	12.00	Petroleum crude	621.53	0.00	0.00	0.00	621.53	March-2013	March-2015

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KANDLA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
5	Upgradation of barge handling facilities at Bunder basin at Kandla Port on BOT basis	3.22	Multipurpose dry cargo	85.74	0.00	0.00	0.00	85.74	March-2012	March-2014
6	Construction of barge jetty at IFFCO	2.00	Dry cargo	27.67	0.00	0.00	0.00	27.67	Aug-2012	Aug-2014
7	Construction of barge jetty at Tuna	4.50		100.00	0.00	0.00	0.00	100.00	March-2014	March-2016
8	Construction of captive barge jetty at Tuna.	1.50		22.00	0.00	0.00	0.00	22.00	March-2013	Sept-2014
SUB TOTAL (B)		50.42		2784.10	521.00	0.00	0.00	2263.10		
C.	Procurement of equipment/crafts etc.									
1	Mechanization of dry cargo handling facilities on PPP (4 nos. of cranes)	7.40		80.60	0.00	0.00	0.00	80.60	May-2012	Dec-2013
SUB TOTAL (C)		7.40		80.60	0.00	0.00	0.00	80.60		
D.	Rail road connectivity works									
1	Extension of road and railway network in the rear of berth no. 11 to 16.			6.33	6.33	0.00	0.00	0.00	2013	2015

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KANDLA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
					(RS. IN CRORES)					
2	Improving the existing infrastructure facilities along berth no. 7 to 10 and its back up.			18.19	18.19	0.00	0.00	0.00	Oct-2011	Oct-2012
3	Development of centralized wagon handling terminal			59.80	59.80	0.00	0.00	0.00	2012	2014
4	Providing rail connectivity to existing Tuna Port.			85.00	85.00	0.00	0.00	0.00	March-2013	Sept-2016
5	Widening of existing road from National Highway 8-A to Tuna (four lane)			15.56	15.56	0.00	0.00	0.00	Jaun-2012	Dec-2013
6	Widening of existing road to 6-lane road			10.00	10.00	0.00	0.00	0.00	March-2013	Sept-2014
7	Construction of two-lane road connecting bunder basin complex on Oil Jetty Complex			5.00	5.00	0.00	0.00	0.00	March-2013	March-2015

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KANDLA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
8	Providing railway line to the godowns outside West Gate 1 south of National Highway 8-A			15.00	15.00	0.00	0.00	0.00	March-2013	March-2015
9	Improving existing railway lines within the cargo jetty area			10.00	10.00	0.00	0.00	0.00	March-2012	March-2014
10	Construction of rail over bridge at Kutch Salt Junction			10.00	10.00	0.00	0.00	0.00	Oct-2012	Oct-2015
11	Development of SEZ			10950.00	0.00	0.00		10950.00	Sept-2011	Sept-2014
12	Construction of port craft jetty & shifting of SNA section (jetty etc).			30.00	30.00	0.00	0.00	0.00	Jan-2012	Dec-2012
13	Construction of rail over bridge at crossing of NH8 for Tuna Port.			10.00	10.00	0.00	0.00	0.00	June-2012	Sept-2015
14	Improving the infrastructure facilities inside CJ area - widening of roads and providing RCC pavement.			14.50	14.50	0.00	0.00	0.00	Jan-2012	Dec-2012
15	Construction of rail over bridge at Tuna.			10.00	10.00	0.00	0.00	0.00	June-2012	Sept-2015
SUB TOTAL (D)		0.00		11249.38	299.38	0.00	0.00	10950.00		

SCHEMES WITH FUNDING PATTERN OF MAJOR PORTS DURING 12TH FIVE-YEAR PLAN

KANDLA PORT TRUST

Sl. No.	Name of the Scheme	Additional Capacity (MT)	Nature of Cargo	Estimated Cost	Source of Finance (Rs. In crores)				Expected Date/Year of commencement	Expected Date/Year of completion
					IR	GBS	EBR & Others	Pvt. Sector		
(RS. IN CRORES)										
E.	Other works									
1	Development of open storage area at the rear of 11th and 12th cargo berth			48.10	48.10	0.00	0.00	0.00	Oct-2011	Oct-2012
2	Construction of storage shed inside port area.			49.50	49.50	0.00	0.00	0.00	June-2013	Dec-2015
3	Shifting of Kandla Port Colony to Gopalpuri.			72.00	72.00	0.00	0.00	0.00	June-2014	June-2016
	Sub Total (E)	0.00		169.60	169.60	0.00	0.00	0.00		
	Grand Total	57.82		14868.68	1574.98	0.00	0.00	13293.70		

ALL PORTS GRAND TOTAL:	526.44		72293.95	11916.18	3046.22	6294.99	51036.56
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Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Kolkata Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	0	0	0	0	0	0
B.	Construction of Berths & Jetties	16.00	2	1553.38	0	0	0	1553.38
C..	Procurement of equipment / Crafts etc	0.00	0	0	0	0	0	0
D.	Rail / Road connectivity works	0.00	2	1023	23	0	0	1000
E.	Other works	0.50	3	50.91	50.91	0	0	0
	GRAND TOTAL	16.50	7	2627.29	73.91	0	0	2553.38

Haldia Dock Complex

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	0	0	0	0	0	0
B.	Construction of Berths & Jetties	17.40	4	1181.78	119.55	0	0	1062.23
C..	Procurement of equipment / Crafts etc	2.00	1	100	100	0	0	0
D.	Rail / Road connectivity works	0.00	0	0	0	0	0	0
E.	Other works	1.00	5	118.5	118.5	0	0	0
	GRAND TOTAL	20.40	10	1400.28	338.05	0	0	1062.23

Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Kolkata Port (RR)

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0	1	1020.22	0	1020.22	0	0
B.	Construction of Berths & Jetties							
C..	Procurement of equipment / Crafts etc							
D.	Rail / Road connectivity works							
E.	Other works							
	GRAND TOTAL	0	1	1020.22	0	1020.22	0	0

Paradip Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	2	138.80	45.80	93.00	0.00	0.00
B.	Construction of Berths & Jetties	40.00	5	1834.34	258.67	0.00	125.88	1449.79
C..	Procurement of equipment / Crafts etc	0.00	0	0.00	0.00	0.00	0.00	0.00
D.	Rail / Road connectivity works	0.00	0	0.00	0.00	0.00	0.00	0.00
E.	Other works	0.00	9	189.79	189.79	0.00	0.00	0.00
	GRAND TOTAL	40.00	16	2162.93	494.26	93.00	125.88	1449.79

Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Vishakapatnam Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS		5	869.91	869.91	0.00	0.00	0.00
B.	Construction of Berths & Jetties	40.60	11	2597.62	201.00	0.00	0.00	2396.62
C..	Procurement of equipment / Crafts etc	15.00	3	548.98	0.00	0.00	0.00	548.98
D.	Rail / Road connectivity works	0.00	9	726.00	726.00	0.00	0.00	0.00
E.	Other works	0.00	14	661.00	241.00	0.00	0.00	420.00
	GRAND TOTAL	55.60	42	5403.51	2037.91	0.00	0.00	3365.60

Ennore Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	29.00	4	600.00	0.00	570.00	30.00	0.00
B.	Construction of Berths & Jetties	18.00	2	200.00	70.00	0.00	0.00	130.00
C..	Procurement of equipment / Crafts etc	0.00	0	0.00	0.00	0.00	0.00	0.00
D.	Rail / Road connectivity works	0.00	5	554.00	204.00	0.00	350.00	0.00
E.	Other works	0.00	2	652.00	202.00	0.00	450.00	0.00
	GRAND TOTAL	47.00	13	2006.00	476.00	570.00	830.00	130.00

Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Chennai Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	7.00	1	143	70	73	0	0
B.	Construction of Berths & Jetties	27.00	4	2033	281.95	0	0	1751.05
C..	Procurement of equipment / Crafts, etc							
D.	Rail / Road connectivity works	0.00	2	2255	226.89	0	2028.11	0
E.	Other works	1.00	12	835.7	139.5	0	0	696.2
	GRAND TOTAL	35.00	19	5266.7	718.34	73	2028.11	2447.25

Tuticorin Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	6	2768.00	971.00	0.00	1797.00	0.00
B.	Construction of Berths & Jetties	39.90	7	1625.63	9.70	0.00	0.00	1615.93
C..	Procurement of equipment / Crafts, etc	8.30	1	80.10	0.00	0.00	0.00	80.10
D.	Rail / Road connectivity works	0.00	4	207.00	57.00	0.00	0.00	150.00
E.	Other works	0.00	16	1708.00	198.00	0.00	0.00	1510.00
	GRAND TOTAL	48.20	34	6388.73	1235.70	0.00	1797.00	3356.03

Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Cochin Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	4	245.00	35.00	210.00	0.00	0.00
B.	Construction of Berths & Jetties	16.85	6	1037.00	0.00	0.00	0.00	1037.00
C..	Procurement of equipment / Crafts etc	0.00	1	150.00	0.00	0.00	0.00	150.00
D.	Rail / Road connectivity works	0.00	1	40.00	0.00	0.00	40.00	0.00
E.	Other works	0.00	8	243.00	62.00	0.00	0.00	181.00
	GRAND TOTAL	16.85	20	1715.00	97.00	210.00	40.00	1368.00

New Mangalore Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	1	390.00	60.00	330.00	0.00	0.00
B.	Construction of Berths & Jetties	33.92	5	1216.93	226.17	0.00	0.00	990.76
C..	Procurement of equipment / Crafts etc	0.00	0	0.00	0.00	0.00	0.00	0.00
D.	Rail / Road connectivity works	0.00	2	60.00	60.00	0.00	0.00	0.00
E.	Other works	0.00	2	15.00	15.00	0.00	0.00	0.00
	GRAND TOTAL	33.92	10	1681.93	361.17	330.00	0.00	990.76

Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Mormugao Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	2.00	2	615.00	15.00	600.00	0.00	0.00
B.	Construction of Berths & Jetties	22.81	5	1752.30	0.00	150.00	0.00	1602.30
C..	Procurement of equipment / Crafts etc	6.00	1	315.00	0.00	0.00	0.00	315.00
D.	Rail / Road connectivity works	0.00	2	195.00	115.00	0.00	80.00	0.00
E.	Other works	0.00	3	33.00	23.00	0.00	10.00	0.00
	GRAND TOTAL	30.81	13	2910.30	153.00	750.00	90.00	1917.30

Mumbai Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	1	162.00	162.00	0.00	0.00	0.00
B.	Construction of Berths & Jetties	34.60	6	2936.52	1236.00	0.00	0.00	1700.52
C..	Procurement of equipment / Crafts etc	0.00	0	0.00	0.00	0.00	0.00	0.00
D.	Rail / Road connectivity works	0.00	2	216.81	216.81	0.00	0.00	0.00
E.	Other works	0.00	5	160.00	160.00	0.00	0.00	0.00
	GRAND TOTAL	34.60	14	3475.33	1774.81	0.00	0.00	1700.52

Annexure-6.2(ii)

Summary of Port wise funding pattern in various Project Head

Jawaharlal Nehru Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	1	1300.00	1300.00	0.00	0.00	0.00
B.	Construction of Berths & Jetties	86.00	3	8300.00	0.00	0.00	0.00	8300.00
C..	Procurement of equipment / Crafts, etc	3.74	2	151.00	151.00	0.00	0.00	0.00
D.	Rail / Road connectivity works	0.00	12	1649.00	265.00	0.00	1384.00	0.00
E.	Other works	0.00	16	9967.05	865.05	0.00	0.00	9102.00
	GRAND TOTAL	89.74	34	21367.05	2581.05	0.00	1384.00	17402.00

Kandla Port

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	0.00	4	585.00	585.00	0.00	0.00	0.00
B.	Construction of Berths & Jetties	50.42	8	2784.10	521.00	0.00	0.00	2263.10
C..	Procurement of equipment / Crafts, etc	7.40	1	80.60	0.00	0.00	0.00	80.60
D.	Rail / Road connectivity works	0.00	15	11249.38	299.38	0.00	0.00	10950.00
E.	Other works	0.00	3	169.60	169.60	0.00	0.00	0.00
	GRAND TOTAL	57.82	31	14868.68	1574.98	0.00	0.00	13293.70

Summary of Port wise funding pattern in various Project Head

All Major Ports

(Rs in Crore)

Sl. NO.	Ports/Project Head	Additional Capacity (MT)	No of Projects	Estimated cost	Source of Finance (Rs. In crore)			
					IR	GBS	ERR& Others	Pvt. Sector
A.	DEEPENING OF CHANNEL, BERTHS	38.00	32	8836.93	4113.71	2896.22	1827.00	0.00
B.	Construction of Berths & Jetties	443.50	68	29052.60	2924.04	150.00	125.88	25852.68
C..	Procurement of equipment / Crafts, etc	42.44	10	1425.68	251.00	0.00	0.00	1174.68
D.	Rail / Road connectivity works	0.00	56	18175.19	2193.08	0.00	3882.11	12100.00
E.	Other works	2.50	98	14803.55	2434.35	0.00	460.00	11909.20
	GRAND TOTAL	526.44	264	72293.95	11916.18	3046.22	6294.99	51036.56

NOTE : (*) In addition to above, a provision of Rs 1500.00 crore have been made under I.R. for initial equity capital for IP Global, which will be equally contributed i.e Rs 250.00 crore by PPT, VPT, CHPT, MBPT, JNPT KPT.

Annexure-6.3
DETAILS OF SCHEMES FOR THE 12TH FIVE YEAR PLAN FOR ALHW
(Rs. in Crore)

SL. NO.	NAME OF SCHEMES	ESTIMATE D COST	Expenditure upto (March' 11)	BE 2011-12	EXP. ANTICIPATED IN 11 TH FY PLAN	OUTLAY 12TH PALN	PHASING					
							2012-13	2013-14	2014-15	2015-16	2016-17	
1	A&N ISLANDS											
a)	Continuing Schemes											
i	Dredging in Harbours in A&N Island	40.00	2.13	6.15	8.28	31.72	6.72	10.00	10.00	5.00	--	--
ii	Reconstruction of office building complex for ALHW	11.76	10.07	1.00	11.07	0.69	0.69	--	--	--	--	--
iii	Construction of Finger Jetties under development of Junglighat Harbour Phase - II	78.93	27.63	30.00	57.63	21.30	21.30	--	--	--	--	--
iv	Construction of jetty at Chowra	14.98	3.35	8.66	12.01	2.97	2.97	--	--	--	--	--
v	Construction of additional jetty for mainland vessels at Kamorta	48.00	0.00	0.25	0.25	47.75	15.00	20.00	12.75	--	--	--
vi	Construction of jetty at Gandhi Nagar in GNI	14.99	9.28	5.00	14.28	0.71	0.71	--	--	--	--	--
vii	Replenishing of damaged Breakwater and approach to wharf at Hut Bay in Little Andaman	80.98	48.12	18.76	66.88	14.10	14.10	--	--	--	--	--
viii	Acquisition of two number tug	90.00	0.05	0.10	0.15	89.85	15.00	20.00	54.85	--	--	--

b	New Schemes										
i)	Extension of Break water by 300 mtrs at Campbell Bay in Great Nicobar.	250.00	---	0.00	0.00	160.10	0.10	10.00	50.00	50.00	50.00
ii	Construction and development of Berth for container vessels of 14m draft at Blair Reef in Port Blair	300.00	---	0.00	0.00	80.10	0.10	10.00	20.00	25.00	25.00
iii	Replacement & up-gradation of Cargo Handling equipments in various ports of A&N Islands.	30.00	---	0.00	0.00	30.00	0.10	4.90	5.00	8.00	12.00
iv	Additional approach to Wharf at Hut Bay	45.00	---	0.00	0.00	45.00	0.10	0.10	14.80	10.00	20.00
2	LAKHSADWEEP ISLANDS										
a)	Continuing Schemes										
i)	Providing Eastern side embarkation facilities in Amini.	21.51	20.54	0.33	20.87	0.50	0.50	--	--	--	--
ii	Providing Eastern side embarkation facilities in Kavaratti.	20.44	17.30	2.60	19.90	0.50	0.50	--	--	--	--
iii	Procurement of Cutter Suction Dredger for Lakshdweep Ports.	4.93	1.01	3.66	4.67	0.26	0.26	--	--	--	--
b	New Schemes										
i)	EXTension of 3rd stage Breakwater at Androth	425.00	0.00	0.00	0.00	275.00	0.00	25.00	50.00	100.00	100.00
ii	Feasibility studies for Construction of Breakwaters at Amini, Kadmath, Kiltan, Chetlat & Bitra	6.00	0.00	0.00	0.00	6.00	2.00	2.00	2.00	0.00	0.00

iii	Providing Slipway with workshop facilities at Kavaratti, Minicoy, Kadmath, Agathi, Chetlath	20.00	0.00	0.00	0.00	20.00	0.25	1.00	5.00	10.00	3.75
iv	Replacement & up-gradation of Cargo Handling equipments in various ports of Lakshadweep.	6.00	0.00	0.00	0.00	6.00	0.25	1.00	1.50	2.00	1.25
v)	Dredging in the Navigational Channels & Harbours and providing Navigational Aids in Lakshadweep	50.00	0.00	0.00	0.00	21.20	0.10	0.10	1.00	10.00	10.00
vi	Feasibility studies in connection with recommendations of Capt. PVK Mohan Committee for improvement to berthing in easternside jetties at Lakshadweep.	6.00	0.00	0.00	0.00	6.00	1.00	1.00	2.00	1.00	1.00
3	Establishment		21.53	9.05	30.58	45.00	7.00	8.00	9.00	10.00	11.00
4	Grand Total	1564.52	161.02	85.56	246.58	904.74	88.75	113.10	237.90	231.00	234.00

Annexure-6.4(i)

DETAILS OF SCHEMES FOR THE 12TH FIVE YEAR PLAN FOR DCI

Rs. In crore

S.No.	Particulars	Scheme Cost	12th Plan Req.	Phasing of Expenditure for 12th Plan					
				2012-13	2013-14	2014-15	2015-16	2016-17	Total
1	New Trailor Suction Hopper Dredger (TSHD) of 5500 Cu.M. hopper capacity (1)	1570.21	178.00	178.00	0.00	0.00	0.00	0.00	178.00
2	New Trailor Suction Hopper Dredger (TSHD) of 5500 Cu.M. hopper capacity (2)		378.00	275.00	103.00	0.00	0.00	0.00	378.00
3	New Trailor Suction Hopper Dredger (TSHD) of 5500 Cu.M. hopper capacity (3)		424.00	94.00	260.00	70.00	0.00	0.00	424.00
4	New Trailor Suction Hopper Dredger (TSHD) of 9000 Cu.M. hopper capacity or above.	650.00	390.00	0.00	0.00	65.00	195.00	130.00	390.00
5	New Trailor Suction Hopper Dredger (TSHD) of 9000 Cu.M. hopper capacity or above.	650.00	65.00	0.00	0.00	0.00	0.00	65.00	65.00
6	2 Nos. Self Propelled Barges	90.00	90.00	0.00		18.00	36.00	36.00	90.00
7	Retrofit of old Dredger	300.00	300.00	0.00	30.00	120.00	100.00	50.00	300.00
8	Multicat	20.00	20.00	0.00	2.00	18.00	0.00	0.00	20.00

9	Instrumentation to Dredgers	15.00	10.00	2.00	2.00	2.00	2.00	2.00	10.00
10	Land Boosters for Cutter Suction Dredgers	20.00	17.00	17.00	0.00	0.00	0.00	0.00	17.00
11	Land Boosters for pipeline operations	20.00	20.00	0.00	2.00	18.00	0.00	0.00	20.00
12	50 ton BP tug	40.00	40.00				20.00	20.00	40.00
13	Adminstrative Building.	40.00	40.00	20.00	20.00	0.00	0.00	0.00	40.00
	Total	3415.21	1972.00	586.00	419.00	311.00	353.00	303.00	1972.00

Annexure-6.4(ii)

Year wise anticipated capacity addition of dredgers by DCI during 12th Five Year Plan

Year	Type of Dredgers added/to be added			Capacity at the end of the year in M cum		
	TSHD's	CSD's	Auxillary Equipment	TSHD's	CSD's / Backhoe	Total
2012-13	One No. TSHD 5500 Cum Expected Delivery Dec 2012	--	1. Anchor Pontoon/ A-Frame	81.54	11.85	93.39
2013-14	One No. TSHD 5500 Cum Expected Delivery June 2013	--	1. One No. Multicat 2. Pipeline and other ancillaries 3. Land Boosters for Pipeline operations 4. Anchor Pontoon/ A-Frame	89.48	11.85	101.33
2014-15	1. One No. TSHD 5500 Cum Expected Delivery Oct 2014 2. One No. TSHD 9000 Cum Order to be placed	--	1. Pipeline and other ancillaries 2. Land Booster for Pipeline operations	97.42	11.85	109.27
2015-16	-	--	1. Pipeline and other ancillaries 2. Land Boosters for Pipeline operations	97.42	11.85	109.27
2016-17	Expected delivery of 9000 Cum Apr 2016	--	--	110.42	11.85	122.27

Annexure-6.5

DETAILS OF R & D SCHEMES FOR THE 12TH FIVE YEAR PLAN

(Rs. In Crore)

Sl. No.	Name of the Scheme	Estimated Cost Original	12 th Plan	2012-13	2013-14	2014-15	2015-16	2016-17
A-1	Critical ongoing schemes as on 31.03.2012							
	(1) Development of deep draft Port in Andhra Pradesh	5.00	5.00	1.00	1.00	1.00	1.00	1.00
	(2) MSDC meeting	1.50	1.50	0.30	0.30	0.30	0.30	0.30
	R & D Schemes							
	(a) Ongoing Schemes							
	(i) Interaction of ships with basin entrance and approach channels	0.33	-	-	-	-	-	-
	(ii) FRP Laminated Sandwich panels for bridges/walkways of Marine structures	0.25	0.07	0.07	-	-	-	-
	SUB TOTAL (A)	7.08	6.57	1.37	1.30	1.30	1.30	1.30
A-2	New Schemes							
	(i) Geo-Hydro Morphological studies of three tributaries and their impact on sedimentation with respect to some critical stretches in	0.47	0.33	0.14	0.11	0.08	-	-

	Hooghly river and estuary							
	(ii) Schemes yet to be identified		0.60	0.12	0.12	0.12	0.12	0.12
	SUB TOTAL (B)	0.47	0.93	0.26	0.23	0.20	0.12	0.12
	TOTAL (A+B)	7.55	7.50	1.63	1.53	1.50	1.42	1.42

Annexure-6.6**Important Development Schemes to be taken up during 12th Plan by respective State Government/Maritime Boards**

Sl.No.	Name of the scheme	Commodity	Capacity addition (in MTPA)
GUJARAT MARITIME BOARD			
1.	Captive jetty at Salaya by Essar Group	Dry Bulk	30.00
2.	Extension of captive jetty at Jakhau by Sanghi Cement	Dry Bulk	8.00
3.	Construction of Ro Ro Terminal at Ghogah and Dehej by GMB	Dry Bulk	1.00
4.	Development of Private terminal by Universal Success Enterprise Ltd.	Dry Bulk	10.00
5.	Second SPM by M/s. Reliance Industries	Liquid	4.00
6.	Salt Jetty at Bagasara	Dry Bulk	1.00
7.	Container terminal at Mundra by MPSEZ, South Port	Container	35.00
8.	LNG berth under subconcession agreement with GSPC by MPSEZ	LNG	5.00
9.	Dahej Port (North of Birla Jetty) by Sterling Biotech	Dry Bulk	27.00
10.	Development of new basin for additional berths at Mundra Port by Phase 2 South Port	Dry Bulk	30.00
11.	Nargol Port Projects by GMB/ Private Player	Container	10.00
12.	Pipavav Port by GPPL	Container	5.00
13.	Development of LNG with subconcession with M/s. Swan Energy by GPPL at Pipavav	Dry Bulk	5.00
14.	Chhara Port Project by Shappoorji Palonji group	Dry Bulk	8.00
15.	Development of port facilities bulk and container by Hazira Adani Port Pvt. Ltd.	Container	15.5
16.	Capacity expansion of Sikka Port by Reliance Port and Terminal Pvt. Ltd.	POL	15.00
17.	Kacchigadh Ports by L&T Ltd.	Dry Bulk	5.00
18.	Multi purpose berth at Navalakhi by DMCC	Dry Bulk	4.00
19.	Development of cement jetty by M/s. JP Cement by Jay Prakash	Dry Bulk	8.00
20.	Development of Mahuva Port by GMB	Dry Bulk	3.00
21.	Installation of new SBM by ONGC	POL	5.00
22.	Development of Mandvi by KKM International Pvt. Ltd.	Dry Bulk	3.00
23.	Khambhat Port Phase 1&2 by IL &FS	Dry Bulk	3.00

24.	Development of captive cement jetty at Kori Creek by ABG Cement	Dry Bulk	4.00
25.	Captive jetty expansion by Ultra Tech Cement Ltd.	Dry Bulk	5.00
26.	New private jetty at Koteswar by Good Earth Maritime Ltd.	Dry Bulk	4.00
27.	Cement jetty at Magdilla by ABG cement	Dry Bulk	3.00
28.	Rozi Bedi Port by private investor	Dry Bulk	2.00
29.	Development of Green Field Port at Dholera by JK Group	Dry Bulk	10.00
30.	Development of private terminal at Bhavanagar by USEL	Dry Bulk	3.00
31.	Addition investment in development of floating, storage and regasification unit facilities near Pipavav, SWAN Energy Pvt. Ltd. and GPPL	LNG	13.00
32.	Expansion of existing 550 mtrs deep water terminal by further 1100 mtr at Hazira by ESSAR Bulk terminals Ltd.	Dry Bulk	44.00
33.	Port facilities along Gujarat coast by Indian Potash Ltd.	Dry Bulk	10.00
34.	Coastal shipping along Gujarat Coast by DMCC oil terminal (Navlakhi) Ltd.	Dry Bulk	2.00
35.	New port facilities Khari Creek by Jay Prakash Assn. Ltd.	Dry Bulk	2.5
36.	New port facilities Kori Creek by cargo motors private Ltd.	Dry Bulk	8.00
37.	New port facilities - Kori Creek by Ultra-tech Cement Ltd.	Dry Bulk	7.00
38.	New port facility at Mithi Road village, Kutch by Ahir Salt & Allied Product Pvt. Ltd.	Dry Bulk	2.00
39.	New port facilities Kori Creek by Sparta Cements and Infra Ltd.	Dry Bulk	4.00
40.	Additional investment in private jetty at Koteswar by Archean Chemicals Industries Pvt. Ltd.	Dry Bulk	2.00
41.	Expansion of LNG handling facilities at Dahej	LNG	3.00
42.	Development of Vansiborsi	Container	8.00
SUB TOTAL			377.00
MAHARASHTRA MARITIME BOARD			
1.	Dighi Port by M/s. Dighi Port Ltd.	N.A.	7.68
2.	Jaighad Port Infrastructure Pvt. Ltd.	Bulk/container	2.69
3.	JSW Jaighad Port (8 berths for liquid, general cargo, SBM & Ro Ro)	Liquid/Gen. Cargo/POL/ Ro Ro	38.33
4.	Rewas Port	Container / coal / liquid / Gen. Cargo	59.43

5.	Inspat Dharmatara Jetty	Dry Bulk	24.07
6.	Ulwa – Belapur (Ambuja Cement)	Dry Bulk	0.82
7.	Ranpar (Finolex Industries Ltd)	Dry Bulk	5.00
8.	Sanegaon (Indo Energy International)	N.A.	1.95
9.	Redi Port	N.A.	0.75
10.	Ratnagiri Port	N.A.	0.40
11.	Revdanda Port (WELSPEN)	N.A.	12.60
SUB TOTAL			153.72
ORISSA MARITIME BOARD			
1.	Development of all weather port at Gopalpur	Multi cargo	17.91
2.	Port at Astaranga Port by NEC	Multi cargo	21.75
3.	Chudamani Port (captive port by ESSEL Mining)	Dry Bulk	20.00
4.	Dhamra Port	Dry Bulk	68.00
5.	Subarnarekha Mohan Port	Subarnarekha Mohan Port	13.50
SUB TOTAL			141.16

KARNATAKA MARITIME BOARD			
1.	Development of Karwar Port	N.A.	6.85
2.	Development of Belekeri Port	N.A.	3.00
3.	Development of Haldipur Port	N.A.	9.00
4.	Development of Tadri Port	N.A.	30.65
SUB TOTAL			49.50

GOA			
1.	Capacity addition at Panaji Port	N.A.	1.10
SUB TOTAL			1.10

KERALA MARITIME BOARD			
1.	Development of Ponnali Port	N.A.	4.98
2.	Development of Kollam Port	N.A.	1.74
3.	Development of Vizhinjam Port	N.A.	5.88
4.	Development of Beypore Port	N.A.	1.99
5.	Development of Azhikel Port	N.A.	4.80
SUB TOTAL			19.39

TAMILNADU MARITIME BOARD			
1.	Captive port at Cuddalore	N.A.	5.50
2.	Captive port by Tridem port and Power Company Pvt. Ltd. Thirukuvalai in Nagapattinam Dist.	N.A.	2.00
3.	Captive port by M/s. Udangudi Power Corp. Ltd. Thoothukudi Dist.	N.A.	3.10
4.	Captive port at Nagapattinam	N.A.	3.60
5.	Captive port by Nagarjuna Oil Corporation Pvt. Ltd. , Thiruchopuram	N.A.	7.70
6.	Manappad	N.A.	2.00

7.	Vanagiri	N.A.	1.00
8.	Kattupalli	N.A.	2.40
9.	Silambimangalam	N.A.	1.00
10.	Parangaipeitai	N.A.	2.80
11.	Kaveri	N.A.	1.00
SUB TOTAL			32.10
ANDHRA PRADESH MARITIME BOARD			
1.	Development of Kakinada deep water port	N.A.	8.00
2.	Development of Gangavaram Port	N.A.	17.00
3.	Development of Krishnapatnam Port	N.A.	40.00
4.	Development of Machilipatnam Port	N.A.	17.00
5.	Nakkapalli Port Port	N.A.	4.00
6.	VANPIC (Vodarevu & Nizapatnam Project)	N.A.	40.00
7.	Meghavaram Port	N.A.	1.5
SUB TOTAL			127.50
PONDICHERRY MARITIME BOARD			
1.	Karaikal Port	N.A.	11.70
SUB TOTAL			11.70

CHAPTER - 7

PUBLIC PRIVATE PARTNERSHIP

7.1. INTRODUCTION

7.1.1. The country's international trade volumes are growing faster than GDP and the trend is expected to continue, which warrant creation of adequate port capacity. The resources required to build the necessary infrastructure are much larger and, therefore, public investment has inevitably to be supplemented by private sector investment in Public Private Partnership (PPP) mode. The approach adopted in the Eleventh Plan period has begun to show promising results in the port sector and PPP will remain the preferred mode of development of port infrastructure during the 12th Plan period also. PPPs are expected not only to augment resource availability but also improve efficiency of service delivery besides considerably minimize the time and cost overrun in construction of port projects.

7.1.2. A review of the status of the PPP shows that 30 PPP Projects were completed till September,2011. 25 projects are under implementation and 24 more are under planning & bidding stage, which are likely to be taken up during 2011-12. Capacity addition in major ports during the 11th Plan period due to development through the PPP mode is expected to be 203.86 MMT. The progress made in private sector participation during the 11th Plan has been covered in detail under Chapter 2 of this Report.

7.1.3. As has been highlighted in Chapters 5 and 6, Private Sector participation will play a major role in realizing the anticipated capacity augmentation at the Ports during the 12th Plan with the expected share of private sector contribution in the estimated investment to be around 70% and 98% in the major ports and non-major ports respectively. It is, therefore, imperative that successful working of the PPP model is essential to achieve the ambitious target of more than doubling the existing port capacity by the end of the 12th Plan period.

7.2. EXISTING POLICY FRAMEWORK AND THE WAY FORWARD

7.2.1. With the opening up of the Indian economy, the Government of India has announced in 1996, a set of guidelines for private sector participation in Major Ports to infuse funds, induct latest technology, improved management practices and above all addition of capacity. Foreign Direct Investment up to 100% is permitted for construction and maintenance of ports and harbours. To ensure uniformity, Request for Qualification (RFQ), Request for Proposal (RFP) and Model Concession Agreement (MCA) documents have been standardized and adopted. Adoption of such standardized documents for award of PPP projects has streamlined and accelerated decision making in a manner that is fair, transparent and competitive. The Government of India constituted Public Private Partnership Appraisal Committee (PPPAC) under the Chairmanship of Secretary, Department of Economic Affairs, and Ministry of Finance to appraise the proposals under Public Private Partnership (PPP) mode. The tariff setting mechanism has also been modified with tariffs being set upfront by the Tariff Authority for Major Ports (TAMP) before the projects are bid out on a revenue sharing basis, so as to reduce regulatory uncertainties.

7.2.3. Land is the major critical and scarce resource which is vital for port development. The Ministry of Shipping announced Land Policy Guidelines, 2010 in January 2011, which for the first time included allotment of lands for BOT projects at major ports. The guidelines elaborately set out the methodology of determination and periodic revision of lease rentals and other conditions of allotment of lands.

7.2.4. While privatizing public assets, a cautious approach is to be adopted to ensure that private monopolies do not abuse their dominant market position. In order to prevent private monopolies in Port sector and promote healthy competition, the Ministry of Shipping announced a monopoly policy in August, 2010 whereby an operator (or, his associate) of the only private terminal in a port for a specific cargo is not allowed to bid for the next terminal for handling the same cargo in the same port.

7.2.5. In order to enable major ports to attract specific port based industries with large traffic potential by offering dedicated port facility, the Ministry of Shipping is in the process of formulating captive port policy, which is likely to be announce soon. The policy will ensure that captive facilities are awarded based on a transparent price discovery method and without hindering availability of port facilities on common user basis.

7.2.6. There is a view that the existing PPP model does not fully permit customization of the model documents and procedures to suit the peculiarities of a particular project. The logistic industry and the global economy are dynamic and to effectively respond to the changes taking place in such dynamic situation, flexibility in the PPP model may become necessary. Realising this need, the Maritime Agenda 2010-2020 announced by the Ministry of Shipping envisages a periodic review and updating of these standardized documents once in five years. There could also be a quasi-judicial independent appellate authority to consider review and changes in concession agreement after consultation with other stakeholders with a view to enable terminal operators and ports to perform at optimal levels without effecting other stake holders adversely.

7.2.7. The procedures for project approvals in the public sector and inadequate delegation of powers to the major ports result in delays and cost escalation. A “single window” approach for approvals may be evolved in consultation with all concerned Ministries as the order of private investment required to achieve the 12th Plan capacity targets, and consequently the number of PPP projects to be awarded will be very high.

7.2.8. At present, the port sector does not get treatment on par with other infrastructure sectors like roads. Tax concession on machinery or equipment by ports is not being allowed which come in the way of modernization and green-field development as well as to creation of new green-field ports. There is also a demand to treat the entire port and ancillary activities as industry and port area as SEZ, for the purpose of tax concessions automatically. There are many PPP projects where port infrastructure / connectivity forms part of the project which

make the PPP option less viable / attractive. Since Assistance to state for Developing Export Infrastructure (ASIDE) is a scheme of Ministry of Commerce to encourage better port related infrastructure, the benefits of the Scheme may be extended to PPP initiatives within the port (like roads/ parking plazas etc.) which will enhance the viability of the Projects and encourage the private sector to invest in PPP.

7.3. NEW AND EMERGING AREAS OF PRIVATE INVESTMENTS

7.3.1. There is a need to expand the existing framework to attract participation from the private sector for development of infrastructure facilities other than container terminals and other berths, by including new areas for private investment in the port and for port related activities. Such new areas should be tapped in such a way that they contribute to optimum utilization of the waterfront and back up land and return maximum revenue share to the ports. Some such new areas for private investment are discussed below:

i) Dredging: Dredging is mainly carried out by the ports themselves. Private sector investment in the form of SPV or PPP mode can be thought of. If the private sector is to carry out capital dredging and maintain the channel depth, the quality is also expected to improve as the operator has to maintain the channel during the concession period. However, if dredging is taken on PPP basis, the project may become unviable with meager port dues and high incidence of cost may have to be passed on to the trade by operator by way of dredging charge. Hence, a pilot project of dredging in a port on PPP basis can be explored during the plan period.

ii) Road infrastructure: Road connectivity of a port can be enhanced and quality of service can be improved by further introduction of private sector investment. This will help the ports in better evacuation of cargo. The ports can also participate as a partner of a SPV with the private sector and / or with public sector authority like NHAI.

Following improvements in rail operations can be achieved with private participation:

- The ports may be given freedom to have PPP partners to handle captive rail cargo
- ICDs may be started with higher MGT requirements in order to have economies of scale and full rakes for each port terminal
- Higher mechanisation of bulk handling through outsourcing/leasing from private sector
- The ports may be given permission to own rakes to carry the cargo, while the non-moving infrastructure may remain with the railways. The operation of such rakes may be outsourced with revenue sharing with the private partner

iv) Special Economic Zone: Development of special economic zones (SEZ) for the port based warehousing and industrial activity inside and in the vicinity of the port will add to the port's business and create a synergy with the port activities. Such SEZ based industries will facilitate businesses to give faster response to the demand from the international market. Customized models of PPP are necessary for developing SEZs in the port sector: e.g. BOT with period of 60 years or more, DBFOT for FTWZs, leasing for storage/warehousing, upfront payment system for private developers etc. Ports by leasing out such developed land for commercial infrastructure related activities can earn substantial revenue out of it which can be used for funding for dredging, rail/road connectivity, better infrastructure, etc.

v) Integrated Parking Zone: Development of integrated parking zones in the port area has become essential as the cargo traffic at all the ports is increasing and about 75% of the cargo is being evacuated by road. The number of vehicles visiting the port has been increasing and generally the vehicles remain parked on the approach road sides blocking these roads for the public. Development of a parking zone including all facilities like food malls, dormitories/ rooms, toilets and shops and even small cinemas is essential. Development of such zones on PPP basis can be taken up by all the ports

vi) Recreational activities like marinas, cruise shipping terminal, etc.:

There is a growing demand in water recreational activities near port cities. Ports can develop marinas, cruise shipping terminals with land side development like

hotels, malls, recreational centres, etc., on a PPP mode. These facilities can also be provided with wharves for boats, re-fuelling, washing, parking, repairs, etc., as well as recreational and dining facilities for the staff employed. This may add to the local employment and boost tourism which, in turn, will be a revenue source.

vii) Coastal shipping and inland waterways with port connectivity:

Riverine ports can be approached from the hinterland also by using inland waterways. The cargo can be transported using barges which is more economical and eco-friendly way of transportation. In order to ensure that as done by NHA in the highway sector, viability for projects with clear schemes is created for in-land waterways development including dredging, construction of road connectivity assets as well as for coastal shipping .

viii) Ship-repairs, ship-building and dry docking:

There is an increasing demand from market and trade for development of facilities for ship-repairs and ship-building in the major ports' vicinity. The ports may develop such facilities through private investment by leasing out land for long term.

ix) Energy generation:

Private investment in captive energy generation for ports is feasible and has become necessary in view of the high commercial tariffs that currently ports pay for power. The ports having surplus funds can invest in such captive power projects on PPP basis or by forming SPV with the private sector. In renewable/non-conventional energy, long-term power purchase agreements could be made with completed projects for wind, biomass and solar energy. Use of non conventional energy could make ports greener in their operations and reduce the power costs.

CHAPTER - 8

INSTITUTIONAL REFORMS AND REGULATORY ASPECTS

8.1. INTRODUCTION

8.1.1. Port reforms include changing the institutional structure of the port business and the much greater involvement of the private sector in the exploitation and financing of port facilities and services. It is commonly believed that the only way to improve performance of a public port organisation is through the process of privatisation as certain characteristic of private sector is indispensable to achieve commercial success. However, typical reforms follow various stages, the most important of which are liberalisation, commercialisation and eventually corporatisation. Indian ports are already witnessing the process of liberalisation due to induction of private players to operate in areas which were previously only with the public sector. The process of commercialisation has also set in with more autonomy granted to the ports.

8.2. CORPORATISATION

8.2.1. Institutional reform is primarily intended to improve but not necessarily to change the management and ownership of public ports. The main objective is to increase efficiency and improve the quality of service by making port management more responsible to the needs of the port users. Corporatisation envisages conversion of major ports trusts into truly commercial organisation. It is the process by which a port trust is converted into legally and financially independent entity with its own Board of Directors and governed by the provisions of the Companies Act.

8.2.2. Corporatisation is expected to result in improvement of the working atmosphere of the ports, better accessibility to technology and funds besides promoting fast commercial decisions. The accounts are to be maintained on a commercial basis which will be a pre requisite for the ports to access banks and

financial institution for raising funds. The ports can also tap the primary market for augmenting their capital structure.

8.2.3. Some of the problematic issues confronting corporatisation of ports is the need to judiciously mix the public and private objectives as well as resolving the labour and industrial relation issues. Revaluation of assets and transfer of ownership also pose some challenges.

8.2.4. The overwhelming benefit of corporatisation, and the fact that it is one of the options found successful internationally, should accelerate its implementation. Towards this end, Maritime Agenda 2010-2020 announced by the Ministry of Shipping proposes corporatisation of ports. In the first phase, three ports are expected to be corporatised beginning with JNPT. Deserving ports would be conferred with Navratna or Miniratna status which will enable substantial autonomy in their functioning to these entities.

8.3. ENHANCED DELEGATION OF POWERS TO PORTS

8.3.1. There is an immediate need to administratively and financially empower the existing major ports. Corporatisation may only be the change in the form of management and may not yield the desired result unless such structural changes are coupled with enhanced administrative and financial autonomy. That being so, the existing delegation of powers granted to the ports may have to be reviewed immediately. The existing financial power to sanction and execute project by ports can be enhanced on a selective basis depends on the throughput, profitability, growth, etc. of the ports.

8.4. LEGISLATIVE REFORMS

8.4.1. Presently, Indian Ports Act, 1908 extends uniformly to all the ports in the country whereas, the Major Port Trusts Act, 1963 apply only in respect of the Major Port Trusts. Though both the Acts have undergone piecemeal revisions to accommodate necessary changes from time to time, no comprehensive review of the various provisions of the Act was carried out so far. The Ministry of Shipping has recently launched an exercise to unify and simplify the existing Statutes.

Accordingly, Indian Ports Bill 2011 has been prepared. The new Statute will eliminate those provisions in the existing statute which will no longer be required and include such provisions which are in tune with the present needs. Part A of the consolidated Act will cover the various provisions applicable to both the Major Ports and non Major Ports, (Public or Private) and Part B will deal only with ownership and management of Major Port Trusts.

8.4.2. While consolidating the existing statutes, the provision relating to tariff regulation at major ports trusts have been delinked and a separate act for creating Port Regulatory Authorities is under consideration. Accordingly, the Ministry of Shipping has prepared draft Port Regulatory Authorities Bill which is in consultation with different stakeholders including with Maritime State Governments.

8.5 ECONOMIC REGULATION IN PORT SECTOR AND REGULATORY REFORMS

8.5.1. With the opening up of the port sector for private participation, the Government announced the 'Guidelines for Private Sector Participation in Major Ports' in 1996 which, *inter alia*, envisage setting up of an independent regulatory body for fixing and revising port tariff. The objective was to protect the interest of port users and equally to ensure fair and reasonable returns to port operators. Accordingly, Tariff Authority for Major Ports (TAMP) was constituted in April 1997 by an amendment to the port laws. The jurisdiction of TAMP is restricted to regulating the tariff for the services rendered by as well as use of properties of the major port trusts or the private operators functioning therein. TAMP is empowered not only to fix the rate but also to prescribe the statement of conditions governing the services provided or the facilities extended by the major port trusts or the private operators.

8.5.2. In fixing tariff, TAMP is governed by two sets of tariff guidelines issued by the Government. Tariff guidelines of 2005 are applied to all the major port trusts and the private terminals which have come into operation before February 1998. These guidelines have adopted a portwise cost plus approach with a predetermined level of return on capital employed. In order to protect the interest

of port users, these guidelines do not permit full pass through of revenue share / royalty payable by a private operators to the landlord port and only in some exceptional cases permit a partial pass through. With an objective of ensuring availability of funds for long term capital projects of port trusts, these guidelines require the major port trusts to keep the revenue share / royalty receipts in a separate escrow account which is to be utilised for infrastructure development at the port. A general view, however, prevails that the cost plus regime does not adequately incentivise efficiency and, on the other hand, tolerates inefficiency in the name of actuals. Further, there is also a view that rate of return regulation and revenue share based bidding with the quoted revenue share is not being considered in tariff computation are incompatible. The guidelines are already taken up for comprehensive review and a gradual shift towards a norm based tariff approach is envisaged. The revised guidelines are expected to be implemented from 2012-13.

8.5.3. In order to eliminate some of the inconsistencies observed in the tariff guidelines of 2005, a separate set of guidelines for PPP projects in major ports was issued in February 2008. These guidelines are applicable for the projects to be bid out after February 2008 and aim at providing comfort to investors by announcing tariff in advance before they submit their financial bids which will reduce regulatory uncertainties. Since a normative approach is adopted to fix tariff, the tariff fixation does not depend upon the actual costing of an individual operator. The same tariff base is kept unaltered for the whole concession period with suitable annual indexation at 60% of the WPI. Some concerns are, however, expressed about keeping the same tariff base unaltered for 30 year period. These guidelines are due for review in the year 2013 and the existing norms will be updated with reference to the technological changes and actual performance witnessed during the intervening period.

8.5.4. With the introduction of independent tariff regulation, tariffs at major ports are streamlined and rationalised and tariff setting has become transparent and objective by following a participative approach. Based on a review of the tariff regulatory arrangement at Major Port Trusts which is in existence for more than a

decade now, several suggestions for improvement have been received. Some of them are as follows:

- (i) There is a need for introducing uniform economic regulatory framework covering the entire port sector.
- (ii) Scope of regulation should cover not only tariff setting, as at present, but also include setting, monitoring and regulating the service levels and performance standards. The regulator may also be entrusted with the responsibility of dispute resolution, as appropriate.
- (iii). A detailed study should be commissioned to assess the extend of competition prevailing in the market for provision of port services in difference regions for different types of commodities. If such a study reveals the existence of free market conditions, tariff fixation may be left to the market forces with the regulatory intervention to be limited to adjudicating disputes, if any arising between the service providers and port users.
- (iv). 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 relooked into. The guidelines may be amended to provide for a periodic review of tariff, say once in five years, based on updated norms.
- v) Tariff guidelines of 2005, which are 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.

- vi) The operators may be allowed to retain the benefit of efficiency gain, provided tariff is set based on the pre-determined standards instead of relying upon their own past performance and projections made by them for future period.
- vii) Regulatory approvals may be granted in a time bound manner and towards this end, the regulatory process should be streamlined including adequately strengthening, administratively as well as, statutorily, the regulatory organization.
- viii) The regulator should have some degree of independence or autonomy.

8.5.5. It is a fact that the scenario in a port sector has considerably changed since 1997 warranting a relook at the scope of regulation. As has been analysed earlier in this report, the traffic and capacity at the non major port trusts will soon match those of the major ports; but, the existing regulatory arrangement is confined only to the major ports and that too, in respect of major port trusts only. Further, with the concerted efforts, adequate capacity will be created and a semblance of the competition has set in some areas of port functioning. These developments warrant a change in the regulatory arrangement to have a uniform coverage of the whole sector with a greater emphasis on performance regulation rather than tariff setting. In line with the announcement made in the Maritime Agenda 2010-11, the Ministry of Shipping has reviewed the existing arrangement and has decided to introduce a more objective and comprehensive regulatory framework. Towards this end, a draft Port Regulatory Authorities Bill has been prepared, which is taken up in consultation with all relevant stakeholders including the Maritime State Governments.

8.5.6. The salient features of the new regulatory arrangement envisaged by the Port Regulatory Authorities Bill are as follows:

- A two tier regulatory set up with Major Ports Regulatory Authority having oversight on all major ports and State Ports Regulatory Authorities with regulatory jurisdiction over the non major ports situated in the respective Maritime State.
- Port Authorities and operators will have freedom to determine their tariffs adhering to the broad guidelines to be issued by the Regulators.
- Regulators will lay down performance norms and standards of quality of service and monitor actual performance of port authorities and operators with a view to secure compliance of the desired performance level.
- A separate Appellate Tribunal to adjudicate any dispute between two or more service providers or between a service provider and the concerned port users.
- Adequate statutory powers to Regulatory bodies and Appellate Tribunal for efficient discharge of their mandates.

8.5.7. It is expected that the Indian Ports Bill and the Port Regulatory Authorities Bill will be introduced in the Parliament soon and the new set of laws will come into force during the 12th Plan period.

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CHAPTER - 9

DREDGING REQUIREMENTS & POLICY FRAME-WORK

9.1 General

9.1.1 Drafts at Indian Ports (both in the channel and at berths) historically been very low and not in commensurate with the developments taking place in the world in terms of change of ship sizes, higher parcel sizes, changes in cargo trends such as containerization, project cargos etc.. Draft available in Major Ports as on 31.03.2011 is given as below :

Port	Draft at Channel (in mts)	Available Drafts at Berths (In mts)	Port	Draft at Channel (in mts)	Available Drafts at Berths (In mts)
Kolkata	7.9	7.1 to 13.7	Cochin	12.8	9.14 to 12.5
Haldia	6.7	Depends on tidal variations	New Mangalore	15.4	7.0 to 14.0
Paradip	12.8	11.0 to 13.5	Mormugao	14.4	12.0 to 14.1
Visakhapatnam	10.7(IH), 20.0(OH)	9.75 to 17.0	Mumbai	10.9	6.1 to 14.3
Chennai	18.6(IH) 19.2(OH)	8.5 to 17.4	Jawaharlal Nehru	11.0	12.0 to 13.5
Tuticorin	10.4	8.6 to 10.90	Kandla	11.6, 23.5(OOT)	9.1 to 12.5

As may be seen from the table, the draft at Major Ports ranges from 7 meters in older Ports and upto 17 meters in newer Ports. Higher drafts are available in very few Ports only. Internationally, top 20 Container Ports in the world have draft ranging from 14 meters to 16 meters even in 2003. Thereafter, some Ports in China and other countries have enhanced drafts still further to accommodate Super post panamax and above vessels. Hence, there is a great need that Ports in India are required to increase the draft atleast to 14 meters in all Ports during XII plan period and achieve 17 meters in Hub-Ports in post-plan period according to the potential of bigger size calling these Ports.

9.1.2 According to Maritime Agenda 2010-20, The Ministry of Shipping identified 2 Major Ports each on East Coast viz. Chennai and Visakhapatnam and West Coast viz. JNPT and Cochin as Hub Ports. Deepening of channels and berths at these Ports shall be taken up on continuous basis till they achieve 17 meter of Draft.

9.1.3 The requirement of dredging at Indian Ports need to be assessed taking into account the developments planned in all the ports. The accelerated developments of Port infrastructure in the last decade had led to building up dredging capacities by both public and private sector companies engaged in the dredging work. The entry of private sector into the dredging work had helped to a greater extent in meeting the demands from the non major ports. With the increasing share of non major ports traffic, the share of the dredging work by the private sector are likely to increase in the future years. Taking into consideration the role of private sector dredging companies in meeting the requirements, the role of the foreign dredging companies and the public sector companies, the dredging requirements had been assessed.

9.2 Review of dredging work during 11th plan

The dredging work comprise of capital dredging and maintenance dredging. The capital dredging is done to either create new channels, basins, berth etc. or to deepen the existing such infrastructure. The maintenance dredging is carried out to maintain the depth at the existing infrastructure. During the 11th Five year plan, a total quantity of 675.25 MCM and 429.99 MCM had been planned for capital and maintenance dredging respectively for all the ports in the country. This quantity includes the dredging to be done for fishing harbours also besides the major and non major ports. Against this targeted plan, only 278.93 MCM and 291.63 CM had been achieved under the capital and maintenance dredging respectively. This constitutes 41.31% and 67.82% against the targeted quantity. The details are as below:

(In million cubic meters)

S. No.	Sector	Targets			Achievement		
		Capital	Maint.	Total	Capital	Maint.	Total
1	Major Ports (A)	298.28	380.06	678.34	95.36	261.83	357.19
2	<u>Non Major Ports</u>						
	State Ports	368.59	46.41	415.00	182.62	27.81	210.43
	Fishing Harbours	8.38	3.52	11.90	0.95	1.99	2.63
	Sub Total (B)	376.97	49.93	426.90	176.73	29.80	206.22
	Grand Total (A+B)	675.25	429.99	1105.24	278.93	291.63	570.25

The above table indicates that while the major ports achieved 31.97% of the targeted quantity, the non-major ports achievement was 49.55% in capital dredging work. In maintenance dredging work, the figures are 68.89% and 59.92% respectively. The port-wise details of capital and maintenance dredging quantities carried out at Major Ports are given in **Annexure - 9.1**. The maritime state-wise details are given in **Annexure – 9.2**.

The shortfall in achieving the set target is due to many factors. Delay or failure to takeoff number of port development projects, financial and environmental constraints, the need to carry out engineering studies to assess the quantum of dredging and the type of dredging to be performed, poor response from bidders to undertake the work are some of the reasons attributable to the shortfall. Overall, the ports had done better in achieving the target in maintenance dredging. The non major ports had done better than the major ports in capital dredging work.

9.3 Dredging requirement for 12th Plan period

The capital dredging requirements for major ports during the 12th plan period stem from the various port projects planned by the major ports. Ports of Kolkata, Paradip, Visakhapatnam, Ennore, Chennai, Tuticorin, Mormugao, Jawaharlal Nehru and Kandla are planning to undertake the capital dredging of quantities

more than 10 MCM. The capital dredging quantities in respect of other major ports are less than 10 MCM. The total quantity planned is 221.11 MCM of all the 12 major ports including the requirement for Navy. The projection for maintenance dredging at Major Ports is 404.25 MCM. In total the requirement is 625.36 MCM which is almost at the same level when (92.5%) compared with 676.34 MCM projected for the major ports during 11th Five Year plan.

The non major ports have projected a total requirement of 543.61 MCM of which 418.03 MCM is for capital dredging and 128.58 MCM is for maintenance dredging. When compared with the projection of 368.59 MCM and 46.41 MCM respectively for capital and maintenance dredging during 11th Five year plan, there is an increase of nearly 31%. Capital dredging requirement of the State of Orissa, Andhra Pradesh and Gujarat constitute 57.8% of total capital dredging due to development of Gopalpur and Dhamra ports in Orissa, development of Machilipatnam, Krishnapatnam, Kakinada and Gangavaram ports in Andhra Pradesh, and development of Hazira port in Gujarat state. The details of the requirement for both major and non major ports are given under **Annexure - 9.3** and **Annexure - 9.4**. The year wise requirement is given below:

(In million cubic meters)

S.N	Year	Major Ports			Non Major Ports			Fishing Harbours		
		Cap	Main	Total	Cap	Main	Total	Cap	Main	Total
1	2012-13	45.44	71.17	116.61	109.95	13.87	113.12	0.70	2.36	3.06
2	2013-14	84.03	75.17	159.20	129.98	20.43	130.71	0.2	1.07	1.27
3	2014-15	39.95	84.97	124.92	88.99	27.78	97.07	0.2	1.94	2.14
4	2015-16	26.58	86.47	113.05	51.46	26.63	58.39	0.2	1.07	1.27
5	2016-17	25.11	86.47	111.58	37.67	28.48	46.45	0.2	2.04	2.24
	Total	221.11	404.25	625.36	418.03	117.19	445.74	1.5	8.48	9.98

9.3.1 Some of the berthing facilities of Major Ports are not capable with standing 14 m draft vessels for which the berths have to be strengthened before dredging. Alternately, new berths have to be constructed at deeper drafts to handle the 14m draft vessels. The 12th plan dredging requirements, if achieved, will enable

all the Major Ports (except Kolkata) and non-Major Ports to handle the vessels with 14 meters draft at the end of 12th plan period. In case transloading facilities installed at sandheads by Kolkata Port, then Kolkata Port can also handle 14 m draft vessels.

9.4 Meeting the Dredging Requirements of 12th Five Year Plan

The dredging requirement of 12th Five year plan will be met through dredgers of DCI, port owned dredger and through private dredging companies.

9.4.1 Dredging Corporation of India

During the 11th Five year plan period a portion of dredging requirement of major ports was met by Dredging Corporation of India (DCI) and the balance by the private sector dredging companies and by the major ports themselves. The Dredging Corporation of India, a public sector undertaking under Ministry of Shipping, now a 'Mini Ratna' category I PSE had been engaged in meeting the dredging requirements of ports since its inception in 1977. The targets achieved by DCI during the 11th plan would be about 285 million m³ as against the total dredged quantity of 570.25 million m³.

9.4.2 Review of DCI performance in 11th Plan period

A review of the dredging work carried out by DCI indicates that a total quantity of 68.621 MCM is likely to be achieved during the terminal year of 11th plan. The quantities dredged during the first four years viz. 2007-08 to 2010-11 are 45.995 MCM, 49.868 MCM, 53.668 MCM and 67.051 MCM respectively. In all, DCI deployed 10 Trailing Suction Hopper Dredger (TSHD) and 3 Cutter Suction Dredgers (CSD) during these periods. The combined capacity of all the TSHDS is 73.60 MCM and that of CSDs is 11.25 MCM. Hence the total dredging capacity is 84.85 MCM which will become 85.45 MCM if one Backhoe dredger of capacity 0.6 MCM is also taken into account. Compared to the normal requirement for the country (requirements by major, non major and fisheries)

which ranges from 160.27 MCM to 261.96 MCM the % of share could be 53.3 to 32.6. This establishes the need for DCI to augment the capacity in the 12th Five year plan. The details of the quantity dredged by the DCI dredgers are given under:

Quantity dredged by DCI dredgers during 11th Plan period.

Dredger	Dredging Quantity (M Cum)				
	2007-08	2008-09	2009-10	2010-11	2011-12 (Target)
TRAILING SUCTION HOPPER DREDGERS (TSHD's):					
Dredge-V	1.149	3.539	1.672	2.707	2.800
Dredge-VI	1.636	1.899	3.284	3.232	4.081
Dredge-VIII	3.670	2.053	3.323	8.076	3.483
Dredge-IX	34.01	2.957	3.669	4.067	2.956
Dredge-XI	4.167	1.6989	2.262	0.658	1.900
Dredge-XII	1.153	4.970	3.445	6.111	6.600
Dredge-XIV	3.432	1.289	5.922	6.822	5.406
Dredge-XV	9,089	5.592	9.049	8.197	13.800
Dredge-XVI	7.512	4.544	6.344	6.931	7.334
Dredge-XVII	9.813	156.98	10.554	18.688	14.190
Sub-total-1	45.022	44.239	49.524	65.489	62.550
CUTTER SUCTION DREDGERS (CSD's)					
Dredge-VII	0.945	1.354	0.088	0.668	0.400
Dredge-Aquarius	0.028	4.275	4.056	0.871	3.400
Dredge-XVIII	0.00	0.00	0.00	0.023	1.871
Sub-total -2	0.973	5.629	4.144	1.562	6.071
Grand Total	45.995	49.868	53.668	67.051	68.621

9.4.3 Plan for the 12th Plan period

The dredger fleet owned by DCI is ageing and need replacements. Of the 10 TSHDS, seven of them are more than 20 years old and the oldest is 37 years age as of now. Of the 3 CSDs, two of them are 35 and 34 years old. While the dredgers of age less than 10 years had performed nearly 300 days in an year, those with age more than 20 had worked only for 230 to 260 days. Faced with this situation the following plans had been made by DCI in order to augment its capacity.

- (1) Order had been placed for procurement of 3 nos. TSHD of 5500 cm hopper capacity at an estimated cost of Rs.1570.22 crores. The expected

delivery of these dredgers are during December 2012, June 2013 and January 2014.

- (2) 2 nos. TSHD of 9000 cm capacity each at total estimated cost of Rs.1300 crores.
- (3) 2 nos. Self Propelled Hopper barges.
- (4) Retrofit of Dredgers XV, XVI and XVII at an estimated cost of Rs.300 crores.
- (5) Upgradation of the existing 3 Survey launches and provision of land boosters for CSDS.
- (6) Other improvement schemes including construction of new administrative building.

The total outlay for all the above schemes to be spent during the 12th plan period is Rs.1972.0 crores. After augmenting the addition dredgers, the annual dredging capacity is expected to go up to 122.27 million m³ per year as against present capacity 285.45 million m³ per year The scheme wise details and the statement showing year wise projected capacity is given in Chapter 6.

9.4.4 Action Plan for 12th Plan

Besides augmenting the dredging capacity by various schemes, the DCI will also take the following measures in order to improve its performance.

- a) One of the major hurdle faced is in availability of trained manpower to man the dredgers. In order to have the requisite manpower, the All India Dredging Cadre training scheme launched shall be strengthened and suitable measures be taken to retain those trained manpower.
- b) Suitable measures to be taken to overcome the time overrun experienced in dry docking scheme of the existing dredgers.
- c) The possibility of entering into Joint ventures with ports, which have continuous maintenance dredging, to tackle the issues such as funding the acquisition of dredgers, long term contracts for dredging etc.
- d) The dredging work and the dredgers are subject to changing technology. The technological developments and innovations taking place should be

taken cognizant and DCI should go in for latest technology while procuring the dredgers and also in the execution of dredging work.

9.4.5 Dredging work by Major and State Ports with their dredging equipment

The ports of Mumbai, Cochin, Chennai, Visakhapatnam are having grab dredgers. The TSHDs are available at Mumbai, Chennai and Kolkata ports. The combined capacity of all these dredgers together is only meager amount of 3.162 MCM. Of the total six grab dredgers and four TSHDs, five are more than 20 years old and two are not operating. This leaves only three dredgers which are working and of less than 20 years of age. Ports are not having any plan either for replacement or procuring new dredgers.

As far as State ports are concerned, the Gujarat Maritime Board (GMB) have 4 grab dredgers and 4 CSDS. Maharashtra Maritime Board (MMB), Kerala Govt. and the private ports at Karaikal, Krishnapatinam and Mundra also have some form of dredgers. GMB has plans to procure 4 CSDS and grab dredgers during 12th plan.

9.4.6 Dredging work by Private Companies

In private sector, there are 14 companies providing dredging equipments and carrying out dredging work. The details are given under **Annexure – 9.5**.

9.5 Sethusamudram Ship Channel Project

Government of India sanctioned this Sethusamudram Ship Channel Project (SSCP) for total project cost of rs.2427.40 Crores on 1st June 2005. The scope of the project is as under:

- Channel Type	- Two way
- Channel Width	- 300 m
- Channel Depth	- (-) 12m CD
- Sight Distance	- 2.5 Km
- Permitted draft Vessels	- 10 m
- Beam	- 33 m
- LOA	- 215 m
- Design Speed	- 8 Knots

Total length of the channel is 167 Km of which in the central 79 Km dredging is not required as water depths are slightly more than 12 m. Initially Government accorded approval to entrust the dredging work in a length of 13.55 Km in Palk Strait to dredge 13 M. Cum to M/s Dredging Corporation of India. For balance dredging at Palk Strait and Adam's Bridge Tuticorin Port Trust called ICB tenders for two times. But work could not be awarded due to exorbitant rates and additional conditions put forth by the L1 tenderer. Finally on 13th October 2006 Government of India conveyed its approval to award the remaining dredging works also to M/s DCI.

Meanwhile many court cases were filed against this project on Environment and religious grounds. Due to an interim order by Hon'ble Supreme Court dt.14.09.2007 the dredging work at Adam's Bridge was temporarily stopped from 17.09.2007. Due to prolonged court cases and some other internal problems DCI has stopped the dredging works at PalkBay/Palk Strait from 26.07.2009. During 11th Plan period total 28.42 Mm³ capital dredging was carried out for this project. Hearings were completed at Hon'ble Supreme Court during July 2008 and Judgment is awaited. Before completion of hearings Hon'ble Supreme Court suggested for study of an alternative alignment including a canal cutting through the portion between Dhanuskodi and Land Ends of Rameshwaram Island, for which an Expert Committee was formed under the Chairmanship of Dr R K Pachauri, Director General, The Energy and Resources Institute, New Delhi. During its meeting the committee has decided to go for detailed EIA Study for the alternative alignment. The EIA Study was carried out by NIO for one year covering all aspects and draft final report was submitted to the committee during July 2011, which is under the scrutiny of the committee. The Expert Committee is expected to forward its recommendations to Government shortly, which will be submitted to Hon'ble Supreme Court for Judgment. In view of the above no Capital Dredging provision is made in the 12th Five Year Plan. However, a token outlay of Rs.100.00 crore is recommended for the project.

9.6 Issues faced

The dredging is highly capital intensive project and has become more intensive with the requirement posed by new generation ships for deep draft at ports. The major ports undertake the dredging work from the internal resource except Kolkata. The work is undertaken after due approval from the competent authority depending on the cost of the project. The decision on the project is based on IRR. As the dredging work bring benefits for larger section of the port users, a concern is voiced to base the decision on EIRR instead of IRR. Another issue is on funding the project. Internationally the dredging projects are not funded by Ports, instead by local municipalities or the Government. Taking cue from the international practice, the Central Government may explore the possibility of treating the channels alone as national asset (as there could be multiple users) and fund the entire dredging cost.

9.7 Environmental factors

For all development projects, environmental factor is assuring top priority due to the concern raised globally to keep the environment unaffected. EIA notification 2006 and CRZ notification 2011 requires the approval of state Government for CRZ and then MOEF for all dredging projects, which is a time consuming process. Ministry has taken up with MOEF for a clearance from MOEF only after EIA study for existing ports without insisting on CRZ, for which response of MOEF is still awaited.

9.8 PPP in Financing of Dredging

Presently, most of the Ports in India are meeting their expenditure towards Capital and Maintenance dredging through their internal resources. Many-a-time, owing to scarcity of sufficient reserves/ funds, Ports explore the possible sources & funding for channel deepening other than internal resources viz. borrowing from bond market, loans from National/ International agencies/ Banks like IDBI and JICA etc. or seek budgetary support from Govt. of India. Since Dredging

constitutes a major portion of total project as well as operating cost, if funded through internal resources and borrowings, entails the increase in overall Port cost and consequently tariff.

9.8.1 On the other hand, Trade feels that Vessels Related charges (VRC) in Indian Ports are much higher as compared to most of the International Ports. Actually, the main reason behind high VRC is due to inclusion of dredging cost in computation of tariff and Indian Ports are taunted as high-cost Ports.

9.8.2 There is an idea projected in some circles that the dredging projects can be taken up on PPP basis. However, factually, there is hardly any dredging Projects taken up on PPP bases in the world Ports. The reason in that the Projects becomes unviable with the exiting Port dues or a high incidence of cost may have to be passed on to the Trade by the PPP operators towards a separate dredging charge.

9.8.3 However, in order to test the waters on realistic basis, one pilot project in a Major Port will be explored during the XII plan period. If the project is found successful, the same can be replicated in other major Ports too.

9.9 Declaration of Port Channels as National Channel

On an analysis of various practices being followed in other countries, it has to be noted that in most of the maritime nations, the cost of dredging the channels and berths is funded either by the Municipal Govt. owning the Port or the Federal Govt., regulating and controlling the Ports from their budgets. As a result, Ports need not have to struggle to provide deeper Channels for navigation for larger vessels calling on them and Ports are financially healthy to look after the other developmental plans. On the similar lines, the Central Govt. and State Govts. may consider the Dredging of the Port Channel as “National Channel” and fund their Capital dredging projects through budgetary support till all the Ports achieve 14 meters of Draft. These projects could be appraised by EFC/ PIB, depending upon the quantum of financial support.

Annexure - 9.1

REVIEW OF DREDGING QUANTITIES AT MAJOR PORTS DURING 11TH FIVE YEAR PLAN
(Quantity in Million Cubic Meters)

PORT	Target			Achievement		
	Capital	Maintenance	Total	Capital	Maintenance	Total
Kolkata	14.50	114.0	128.50	-	89.38	89.38
Paradip	12.00	15.00	27.00	16.0	12.47	28.47
Vizag	3.87	3.75	7.62	0.475	1.585	2.06
Chennai	-	-	-	0.06	1.12	1.18
Tuticorin	18.39	-	18.39	2.52	-	2.52
Cochin	34.40	96.20	130.60	26.0	69.0	95.00
New Mangalore	16.50	32.50	49.00	-	17.27	17.27
Mormugao	7.80	27.50	35.30	1.36	12.3	13.66
Mumbai	50.63	22.48	73.11	4.62	13.83	18.45
JNPT	56.50	15.0	71.50	-	4.92	4.92
Kandla	12.39	41.6	53.99	3.10	32.36	35.46
Ennore	20.50	1.65	22.15	9.50	1.01	10.51
Indian Navy	-	1.28	1.28	3.299	6.58785	9.89
Sethusamudaram Ship Channel Project	50.80	9.10	59.90	28.42	-	28.42
Total	298.28	380.06	678.34	95.36	261.83	357.19

Annexure - 9.2

REVIEW OF DREDGING QUANTITIES AT NON MAJOR PORTS AND FISHING HARBOURS OF MARITIME STATES, DURING 11TH FIVE YEAR PLAN

(Quantity in Million Cubic Meters)

STATE		Target			Achievement		
		Capital	Maintenance	Total	Capital	Maintenance	Total
West Bengal	Ports	9.0	-	9.0	-	-	-
	Fishing Harbours	-	-	-	-	-	-
Orissa	Ports	45.65	14.5	60.15	59.9	10.0	69.9
	Fishing Harbours	3.70	0.80	4.5			
Andhra Pradesh	Ports	55.27	9.70	64.97	77.0	8.0	85.0
	Fishing Harbours	-	-	-			
Pondicherry	Ports	-	-	-			
	Fishing Harbours	-	-	-			
Tamil Nadu	Ports	8.84	-	8.84	8.84	-	8.84
	Fishing Harbours	-	-	-			
Kerala	Ports	0.20	0.328	0.528	0.20	0.295	0.495
	Fishing Harbours	0.701	1.196	1.897	0.368	1.045	1.413
Karnataka	Ports	3.36	0.50	3.86	Nil	2.0	2.0
	Fishing Harbours	2.49	1.45	3.94	0.27	0.94	1.21
Goa	Ports	0.03	0.02	0.05	-	0.01	0.01
	Fishing Harbours	0.01	-	0.01	0.01	-	0.01
Maharashtra	Ports	193.09	14.11	207.20	28.67	0.5	29.17
	Fishing Harbours	0.925	0.077	1.00	0.30	-	0.30
Gujarat	Ports	53.14	7.25	60.39	8.01	7.00	15.01
	Fishing Harbours	0.55	-	0.55	-	-	-
Total	Ports	368.59	46.41	415.0	182.62	27.81	210.43
	Fishing Harbours	8.38	3.52	11.90	0.95	1.99	2.63

Annexure-9.3

DREDGING REQUIREMENT OF MAJOR PORTS DURING 12TH FIVE YEAR PLAN

(Quantity in Million Cubic Meters)

Port	2012-13		2013-14		2014-15		2015-16		2016-17		Total	
	Cap	Maint	Cap	Maint								
Kolkata	-	22.00	20.88	22.00	-	24.00	-	22.00	-	21.00	20.88	111.00
Paradip	.65	6.0	2.0	6.0	4.5	6.0	2.5	6.0	5.2	6.0	14.85	30.00
Vizag	2.92	0.750	0.58	0.75	1.35	0.75	5.0	0.75	5.5	0.75	15.35	3.75
Chennai	-	1.2	7.95	1.2	4.80	1.2	3.90	1.2	-	1.2	16.65	6.00
Tuticorin	0.52	-	14.37	-	7.5	-	4.18	-	0.91		27.48	-
Cochin	0.5	18.0	1.0	18.0	-	18.0	3.0	18.0	5.0	18.0	9.5	90.00
New Mangalore	0.5	6.0	-	6.0	-	6.0	0.5	6.0	3.50	6.50	4.50	30.50
Mormugao	-	4.0	3.5	4.0	3.5	4.0	3.5	4.0	3.4	4.0	14.0	20.00
Mumbai	4.45	1.5	2.00	4.50	3.00	4.50	-	5.50	-	5.50	9.45	21.5
JNPT	30.0	-	24.75	-	-	6.3	-	6.3	-	6.3	54.75	18.9
Kandla	0.3	6.5	1.5	7.5	9.8	9.0	2.0	10.5	1.5	12.0	15.10	45.50
Ennore	5.0	0.60	5.0	0.60	5.50	0.60	2.0	0.60	0	0.60	17.50	3.0
Indian Navy	0.6	4.62	0.5	4.62	0	4.62	0	5.62	0	4.62	1.10	24.10
Total	45.44	71.17	84.03	75.17	39.95	84.97	26.58	86.47	25.11	86.47	221.11	404.25

DREDGING REQUIREMENT OF MARITIME STATES, DURING 12TH FIVE YEAR PLAN

(Quantity in Million Cubic Meters)

STATE		2012-13		2013-14		2014-15		2015-16		2016-17		Total	
		Cap	Maint	Cap	Maint	Cap	Maint	Cap	Maint	Cap	Maint	Cap	Maint
West Bengal	Ports	-	-	-	-	-	-	-	-	-	-	-	-
	Fishing Harb.												
Orissa	Ports	8.00	6.00	7.00	7.50	8.00	7.50	3.00	7.50	4.00	7.50	30.00	36.00
	Fishing Harb.												
Andhra Pradesh	Ports	41.72	2.5	42.48	2.5	13	3.5	13	3.5	12	3.5	122.18	15.50
	Fishing Harb.												
Karnataka	Ports	0.60	0.90	4.50	0.45	4.00	1.95	-	0.70	-	2.45	9.10	6.45
	Fishing Harb.	0.50	1.12	-	0.45	-	1.32	-	0.45	-	1.42	0.50	4.76
Tamilnadu	Ports	0.84	-	2.73	-	3.99	-	5.46	-	1.68	-	14.70	-
	Fishing Harb.												
Pondicherry	Ports	-	-	-	-	-	-	-	-	-	-	-	-
	Fishing Harb.												
Kerala	Ports	0.50	.465	0.40	0.45	-	0.50	-	0.50	-	0.50	0.90	2.415
	Fishing Harb.		0.583		0.508		0.508		0.508		0.508	-	2.615
Goa	Ports	0.10			0.03		0.03		0.03		0.03	0.10	0.12
	Fishing Harb.		0.009		0.009		0.009		0.009		0.009	-	0.05
Maharashtra	Ports	47.0	2.8	52.9	8.2	40.0	12.9	10.0	12.9	-	12.9	149.90	49.70
	Fishing Harb.	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	1.0	0.50
Gujarat	Ports	10.47	1.2	19.7	1.3	19.7	1.4	19.7	1.5	19.7	1.6	89.27	7.00
	Fishing Harb.		0.55										0.55
ANI		.019	-	.076		.095		.095	-	.095		0.38	-
Total		109.95	16.228	129.98	21.498	88.99	29.718	51.46	27.698	37.67	30.518	418.03	125.58

Annexure - 9.5

**DETAILS OF DREDGERS EQUIPMENT WITH INDIAN PRIVATE
DREDGING COMPANIES**

SNo.	Name of Port/ Organisation	Name/Type of Dredgers & other equipment	Nos.	Capacity/Production
1.	Jaisu Shipping Co.Pvt.Ltd, Kandla			2980 Cum Hopper Capacity
		KAMAL XXVI		3205 Cum Hopper Capacity
		KAMAL XXVII		3200 Cum Hopper Capacity
		KAMAL XXIX		2000 Cum Hopper Capacity
		KAMAL XXXIII		3205 Cum Hopper Capacity
		KAMAL XXXV		8205 Cum Hopper Capacity
		KAMAL XXXX		4500 Cum Hopper Capacity
		KAMAL IX CSD		1200 Cum/Hour
		KAMAL XXVIII CSD		443 Cum/Hour
		KAMAL XXV Bucket Ladder dredger		30000 Cum/day
		KAMAL XXXVI Bucket Ladder dredger		
		KAMAL XXXIV CSD		
		Self propelled Hopper Barges of 1000 cum capacity 3 No's	3 Nos	1000 Cum capacity each
		Hopper Barges	5 Nos.	Capacities ranging from 150 to 1000 Cum
		Towing Tugs	8 Nos.	10 to 35 TBP
Survey Launches	2 Nos.			
2.	Van Oord India Ltd., Mumbai	Sagar Hansa TSHD		8100 Cum
3.	International Sea Ports Dredging (I) Pvt.,Ltd., New Delhi	Pacifique TSHD		9248 Cum
4.	Mercator Lines, Mumbai	1) Darshiniprem		7000 Cum

		2) Bhagawathiprem		7000 Cum
		3) Omkarprem		4500 Cum
		4) Trivdeviprem		5000 Cum
5.	MEKA Corporation , Mumbai	MEKA - 1		3900 Cum
6.	Dharti Dredging & Construction Ltd., Hyderabad	CSD's	8 Nos.	Total HP ranging from 470 to 1450
		Self propelled weed dredgers	4 Nos.	
		Flat top dump barge of 100 tons capacity 1 No.	1 No	100 Tons capacity
		Self propelled twin screw floating cranes	2 Nos.	
7.	Ardeshir B Cursetji & Sons, Mumbai	IHC Beaver 1200 Cutter Suction dredgers	2 Nos.	630 Cum/Hour capacity
		Ellicot 370 HP Cutter Suction Dredgers	3 Nos.	230 Cum/Hour capacity
8.	Maldar Dredging & Salvages Pvt.Ltd., Mumbai	Garb Dredgers	2 Nos.	2 to 3.5 Cum Grab capacity
		Back hoe dredger Mounted on pontoon with three spuds	1 No.	
		Hopper Barges	5 Nos.	250 to 570 Tons
		TATA P & H 655 Crane	1 No.	75 Tons
		Tugs	3 Nos.	6 to 12 Tons Bollard pull
		Clamp Shell Grabs	7 No.s	2 to 3.5 Cum Grab capacity
		Orange peel Grabs	3 Nos.	2 Cum each
9.	Sahara Dredging Ltd., Mumbai	Pontoons mounted with TATA P & H 955 cranes	2 Nos.	75 Tons capacity 7 & 2.5 Mtr. draft
		Hopper Barges	1 No	550 Cum capacity
		Hopper Barges	12 Nos.	300 Cum each
		Towing Tugs	3 Nos.	400 BHP each
		Survey Launches	1 No.	
10.	Seagull Dredging Pvt. Ltd., Mumbai.	Grab Dredgers	1 No.	Grab capacity 3 Cum & with 70 T Crane (HM)
		Grab Dredgers	1 No.	Grab capacity 3.5. cum &

				with 90 T Crane (P&H 1055)
		Hopper Barges	5 Nos.	300 Cum with mechanically operated hand winches 2 Nos.
		Hopper Barges	1 No.	150 Cum with 3 Nos. mechanically operated hand winches.
		Survey Launches	1 No.	165 BHP
11.	Dredging & Desiltation Co. Pvt Ltd., Kolkata	Cutter Suction Dredger	2 Nos.	400 Cum/Hr & installed capacity 645 KW
		Cutter Suction Dredger fitted with Toyo pump	1 No.	120 Cum/Hr & installed capacity 320 KW
		Pontoon Type portable Grab Dredger fitted with Grab Crane	1 No.	10 Tons capacity Grab Crane
12.	M Pallonji & Co. Pvt. Ltd., Mumbai	Crane pontoon with TATA 955 Crane & all other accessories	2 Nos.	
		Dump Barges	4 Nos.	Capacities ranging from 450 to 771 Cum.
		Toyo Cutter Suction pump mounted on a pontoon	1 No.	
		Tug Boat	1 No.	
		Steel Boat	1 No.	
		Wooden Boat	1 No.	
		Crane	1 No.	75 Tons
13.	Ocean Dredging (I) Ltd., Kochi	Cutter Suction Dredger Oceanic I		60 Cum/Hr
		Cutter Suction Dredger Oceanic II		400 Cum/Hr
		Cutter Suction Dredger Oceanic III		30 Cum/Hr
		Cutter Suction Dredger Oceanic IV		700 Cum/Hr
14.	Pluto Shipping Ltd., Mumbai	Grab/ TSHD MV Ganesh One		Hopper capacity 550 cum & Grab capacity 2.29 Cum.

CHAPTER - 10

RAIL ROAD CONNECTIVITY

10.1 Introduction

India has been an emerging and vibrant economy with a huge market and a billion plus population. India has the potential to grow as the fastest economy for the next 30 years and is more likely to occupy the 2nd position after China by 2030. This economic upsurge will be one of the important drivers for the growth of Indian Ports in the years to come. The technological changes in shipping and information technology is likely to trigger the growth in Indian Ports and provide stimulus for cargo handling.

Hinterland connectivity and Information and Communication (ICT) integration among all Port Community members are the two vital elements which drive the port sector in India towards comprehensive development of efficient world class ports.

Ports are no longer isolated entities and they are important and dynamic intermodal modes of global logistics chain. After India opened 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 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 therefore a dynamic mode in the international production and distribution network.

10.2 Traffic Scenario: Major and Non-Major Ports

A review of the cargo traffic handled by major and non major ports, as discussed elsewhere in the report, indicate that the non major ports had registered higher growth rate compared to major ports in last plan period. Hence, it is imperative that a massive Rail/Road connectivity programme for non-major ports be taken up by the respective ministries.

10.3. Mode of Transportation

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 below. 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 carry.

Port Traffic Mode Share (% of Tons Handled)

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

10.4 RAILWAYS

10.4.1 Status

Railways account for the inland haulage of only 24 percent of port cargo, with the Major ports having a 30 percent share and State ports an insignificant 8 percent, indicating the extremely low rail connectivity to ports other than the Major ports. It

means that Railways are presently carrying considerably less than their optimal share of port traffic and road transport has made up the deficit, despite of many negative externalities connected with road traffic, particularly in the major port cities. Rail transport is primarily used for low value commodities for which transport costs are an important component of the delivered price. However, with the exception of coal, which is almost entirely transported by rail, most other commodities are beginning to shift to roads owing to the shortage of rail capacity in many sectors. Iron ore exports have experienced a large shift to roads, on account of capacity crunch being faced by the railways. High value cargo such as containers, are also moving away from rail transport. Fertilizers, limestone and foodgrains are the other dry bulk commodities being moved by rail. The key to improve port connectivity for India's ports will be enhancements in rail connectivity and capacity, which requires as much as 400% increase over the present levels of port traffic carried by Railways.

The main reason for the railways declining share has been inadequate investments in capacity, particularly for freight, the poor quality of service and slow response to various segments of the growing freight demand. The non-availability of wagons, even when line capacity is available is a common problem hurting both bulk and containerized cargo. In the case of container traffic, this shortage of rakes can be attributed to insufficient investment by the Container Corporation of India (CONCOR)

10.4.2 Initiatives taken on Rail Connectivity

During the year 2006, Ministry of Railways announced its new Container Train Policy wherein it allowed Private Operators to obtain licences for operating container trains on Indian Railways network. The policy was conceived with a view to attracting greater share of container traffic for Railways and for introducing competition in rail freight services Railways has given licences to 16 private operators to run trains till date.

Ministry of Railways has undertaken the Construction of a Dedicated Freight Corridor (DFC) between Delhi and Mumbai. It will be a high speed rail connection with multi modal linkages connecting 1483 Kms in length, covering 6 states of India. DFC will help to alleviate congestion with Delhi-Mumbai Corridor considerably which is critical to the hinterland connectivity of the Mumbai and Gujarat Port clusters that serve the largest shore of India's Port traffic. The focus of the DFC is to ensure high impact developments within 150 Km distance on either side of alignment of DFC. This important Project may be aimed to be completed during the XII Plan Period and the DFC should be laid right upto JNPT with the first instance itself. Feeder lines to DFC from the ports need to be planned/carried out by Railways to compliment the capacity and efficiency of DFC. There is a proposal for a 'Logistics Corporation of India' to be created jointly by three public sector undertakings which is in the preliminary stages.

In this, Shipping Corporation of India, Concor and Central Warehousing Corporation of India will be the equity partners in the multi-modal joint venture logistics company. The proposed corporation will provide integrated transport services as an integrated entity by the three public sector corporations as partners. Such an entity should be able to resolve the problems in ensuring seamless movement of cargo, and to provide an 'end-to-end transport solution.' CONCOR and the Warehousing Corporation can take care of the rail and road segments of the chain and Shipping Corporation can provide the shipping link. SCI, CONCOR are keen in this proposal. CONCOR already had a tie-up with the Mumbai-based private shipping line, Shreya Shipping for movement of containers. Such services can also be provided by the private sector, at later stages and at present public sector should take the lead. Railways plans for last mile connectivity to various Major and Non-Major Ports. The outlay on this account need considerable enhancement and special efforts in this regard need to be made by RVNL on urgent basis in order to expedite planning and implementation of these projects.

10.4.3 Policy Initiative on Rail Connectivity

Ministry of Railways has initiated certain PPP policy measures in Railway Infrastructure in order attract private sector participation in rail connectivity projects. The objective of the policy is to attract private sector participation in rail connectivity projects for generating additional rail traffic. These policy initiatives have not progressed well and met with partial success. However, in order to help Railways in increasing the rail borne cargo in the country, the following is suggested:

Special Purpose Vehicles for specific rail connectivity projects with the funding by the Ports and State Governments may continued to be formed and these SPVs can run on commercial lines. These kind of SPVs may also be formed with strategic investors by the Railways for strengthening of existing corridors leading to ports and laying down new railway corridors with the following features:

- Partnerships with strategic partners for bankable projects;
- Project execution with assured funding, under a construction agreement with the SPV;
- Design parameter fixed by the Railways;
- Apportioned earning to the SPV or pro-rata distance basis;
- Railways undertake the O&M under an O&M agreement and recovers expenses on a fixed and variable cost basis.

Apart from the above, Indian Railways should also undertake port connectivity works under under-mentioned models:

- Private line/full contribution model-strategic partners be allowed to undertake construction and maintenance;
- Cost sharing model.

10.4.4 Projects taken up by Railways

The following are the list of Rail connectivity projects taken up during the last 15 years:

Sl. No.	Name of Port to be connected	Scope of work	Length (in Kms.)	Project cost (Rs. in Cr.)	Present Status
1	Haldia	Doubling of Panskura-Haldia section (Phase-I)	14	26	Completed and commissioned
2	New Mangalore	Aresikere-Hassan-Mangalore rail link	236	357	Complete section has been commissioned for goods traffic
3	Kandla	Gandhidham-Palanpur Gauge Conversion	313	550	Completed and commissioned
4	JN Port	Doubling of Panvel-Jasai section	28.5	69	Project completed and commissioned on 25.8.2006.
5	Paradip	Second bridge over Mahanadi	3	140	The bridge has been opened for traffic on 18.7.2008.
6	Tuticorin	Doubling of Madurai-Dindigul section	62.06	126	The construction work of doubling of Kodaikanal Road – Madurai completed and is awaiting CRS inspection. The Project commissioned in July 2009.
7	Kandla Port	Bhildi-Samdhari Gauge Conversion	223	490	Section has been opened for Goods traffic on 28.12.09 and opened for passenger traffic from 28.07.10.
8	Cochin	Vallarpadm-Idapally-New Line	8.86	246.50	Project being executed by RVNL. Trial run conducted on March 2010.
9	Dahej	Gauge conversion of Bharauch-Samni-Dahej	62.33	200.8	Work completed. Engine rolled on 31.3.2011.

Gangavaram Port rail connectivity with Visakhapatnam area has been commissioned in 2008-09. The rail connectivity to Dhamra Port is the first Rail connectivity project under new R3i policy through SPV mode. The Dhamra Port is located 62 km away from the main line network of the Indian Railways and the port has acquired a 125 m wide corridor from Dhamra to Bhadrak which can accommodate two rail tracks and a four lane service road along with service lines viz. transmission lines and pipelines. Other two projects taken up through SPV mode by Indian Railways are Hassan Mangalore Railway Development Corporation and Kutch Railways Company.

10.4.5 Port connectivity Rail Projects

The Status of Ongoing Port Connectivity Rail Projects is as under:-

Sl. No.	Name of Port to be connected	Scope of work	Length (in kms.)	Project cost (Rs. in crore)	Present status
1.	Paradip	Haridaspur-Paradip new line.	82	791.18	Project being executed by RVNL. FLS completed. SHA signed on 11.10.2006 and SPV incorporated. Private land of 472.34 ha in 74 villages has been taken possession out of total requirement of 558.46 ha. involved in 86 villages. Work in progress on Luna Bridge and Mahanadi Bridge. Work delayed due to law and order issues on account of higher compensation being sought by people whose land has been acquired.
2.	Mumbai	Dedicated freight line between Wadala and Kurla	5.66	104 (inc. 55 cr. For hutment removal).	MOU has been signed between Railways & MBPT on 20 th Jan., 2009 for undertaking work as deposit work of MbPT. The targeted time for completion of the project is within one and half year after completion of R&R of project affected persons.

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.	37.9	86.91 for Rajgoda - Tamluk	Project being executed by RVNL. Phase-I of Project Panskura to Rajgoda (16 km.) has already been completed. There is no decision yet on the 16 km. long section between Basulya Sutahata and Haldia.
4.	Krishnapattanam	Obulavarpalle-Krishnapattanam new line	113.12	732.81	Phase-I, Venkatachalam - Krishnapattanam section (19 km.) completed. Land acquisition is in progress in Phase-II (95 km.).
5.	Mormugao	Doubling of Hospet-Vasco Section	352	2127	Doubling between Hospet-Vasco was included in Pink Book 2010-11.

10.4.6. Rail connectivity Projects under consideration

The status of Railways projects under consideration by Railways are as under:

Sl. No.	Name of Port	Scope of work	Length (in Kms.)	Cost (Rs. In Crores)	Present Status
1.	Kolkata	Rail connectivity to proposed jetties at Diamond Harbour	-	-	Survey completed in January, 2007. Survey report has been submitted to KoPT. The length of the line is 2 kms. and will cost Rs.22 crores.

2	Ennore	Puthur-Atipattu Chord line	88.3	446.87	Project is sanctioned in 2008-09 on 50% sharing by Ennore port & balance by Ministry of Railways. Cost sharing has not been finalized and it is being explored to take up the project under New R3i Policy.
3	Rewas	Rail connectivity to Hamrapur	24	464	Proposal submitted to Railway Board in December 2010
4	Jaigarh	Rail connectivity to a) KRCL b) Ukshi (Ratnagiri)	41 159	3462	Proposal submitted to Railway Board in February 2011
5	Jawaharlal Nehru Port	Panvel-Pen	35	181.82	
6	Visakhapatnam	a)Kottavasala-Simhachalam 4 th line b)Vizianagram-Kottavasala 3 rd line	16.69 34.7	108.81 194.84	
7	New Mangalore	a)Hubli-Ankola b)Harihar via Harpanhalli	167 65	337.82 354.06	
8	Mundra	Gandhidham-Adipur	8	27.56	
9	Kandla	a)Gndhidham-Kandla b)Viramgam-Surendranagar c)Bhidi-Viramgam	12 65.26 157	32.99 271.88 398.03	

10.5 ROAD TRANSPORT

10.5.1 NHDP

Road transport is now the predominant mode of inland transport for port cargo. As the economy grows and diversifies into higher value manufacturing goods the option of road transport share of port traffic will grow. It is generally more cost effective for shorter leads and smaller package sizes as it is both costlier and slower than railways for distances in excess of about 300 to 500 km. This is partly due to delays at numerous checkpoints for road traffic at state border crossings. A significant improvement in the quality of road infrastructure over the last few years following the launch of national programs such as the National Highway Development Program (NHDP) has contributed to the growing efficiency and increased reliance on road transport. The other factor favoring road transport is the convenience of door-to-door transport for high value goods which are increasing as trade in finished and intermediate goods increases.

10.5.2 Policy Initiatives-Road Connectivity

Improving hinterland connectivity is to promote inter-port competition and improve the efficiency of services to shippers, Government of India constituted in March, 2005 a Committee of Secretaries to establish policies and priorities for improving port connectivity. The following summarizes the key recommendations of the Committee:

- a. Each Major port should have at least four lane road connectivity and double line rail connectivity.
- b. For those connectivity projects having a lower than prescribed rate of return, budgetary assistance, or Viability Gap Funding in the case of Public-Private Partnership projects, maybe considered.
- c. National Highways Authority of India (NHAI) shall undertake port connectivity (less than 50 km) projects on a BOT basis, and hinterland connectivity highway projects on a BOT basis where possible.

- d. Toll rates for highway port connectivity projects shall be established jointly by NHAI and the Department of Shipping.
- e. It is also emphasized that there is a great need for active participation of State Governments and Major Ports and assist NHAI in case of land acquisition, utility shifting and RR matters.

The above recommendations have been made to satisfy on the needs of the Major ports and as well as Non-Major Ports. While this approach has helped focus attention on the connectivity issues faced by the Major ports and similar approach would help resolving the problem for the State ports.

10.5.3 Road Connectivity

The completed road connectivity projects of Ports are as under:-

S. No.	Stretch	NH No.	Length(Km)
1	Jawaharlal Nehru Port Phase-II	SH 54	14.35
2	Port Connectivity to Mormugoa	17B	13
3	Cochin Port	47	10
4	Paradip Port	5A	77
5	Jawaharlal Nehru Port Phase-I	4B, 4	30
6	Gandhidham – Samakhiali Package III	8A	16.16
7	Gandhidham – Samakhiali Package II	8A	22
8	Gandhidham – Samakhiali Package	8A	18
9	Vishakhapatnam Port	SR	12
	Total		212.51

10.5.4 Ongoing Projects for Major Ports

The Status of ongoing major port projects taken up by NHAI is as under:

Sl. No.	Name of work	Length (in Kms.)	Project Cost (In Rs. Crore)	Present Status
1.	West Bengal Haldia Port Connectivit(NH-41) from Kolaghat to Haldia.	52.50	522	Terminated contract re-awarded and commenced in October, 2008. Physical Progress 76%
2.	Tamil Nadu Chennai-Ennore Port Connectivity	30.00	600	Bids for civil work costing Rs 267.47 crores has been awarded and the work is already commenced
4.	Elevated Road from Gate No.10, Chennai Port to Maduravayal on NH-4 under NHDP Phase-VII (BOT).	19.00	1345	The concession agreement has been signed on 18.5.2009. Financial closure has been declared as 14.9.2010 . Piling work is in progress.
5.	Tuticorin Port Connectivity on NH-7A.	47.20	231.2	The contract terminated in May, 2009. The balance work awarded and agreement signed on 5 th April, 2010. Balance work is as per schedule.
8.	Karnataka New Mangalore Port Connectivity on NH-17, 13 & 48.	37.50	196.50	Work in progress. Present physical progress is 70.51%.
	Total	186.20		

10.5.5 Ongoing projects for non Major Ports

The Summary status of projects undertaken by NHAI for minor ports connectivity is as under:

S. No.	Description of Project	Minor Port being served	Status of Project
1	Four laning of Gandhidham-Mundra Section of NH-8A (Extn.) in the State of Gujarat under NHDP Ph III	Mundra Port, Gujarat	The project has been awarded and concession agreement signed with the Concessionaire M/s. Reliance Infrastructure Ltd. for 25 years. LOA issued on 12.01.2010. Agreement signed on 10.03.2010 with total project cost Rs.953.80 Crores. Schedule completion date would be 2 years and 6months. The appointed date is likely to be declared shortly.
2	Four laning of Maharashtra/Gujarat Border –Surat-Hazira Section of NH-6 in the State of Gujarat under NHDP Ph III	Hazira Port, Gujarat	The project has been awarded and concession agreement signed with the Concessionaire (Soma-Islox Surat Hazira Tollway Pvt. Ltd.) with total project cost of Rs.1509.10 Crores for 19 years. LOA issued on 18.05.2009. Appointed date of the project is 31 st March' 2010 with expected completion after 2 years 6 months.
3	Vijayawada to Machilipatnam on NH-9 in Andhra Pradesh under NHDP Ph III	Machilipatnam, Andhra Pradesh	RFQ for this project has been invited with the last date 28.12. 2010. The total project cost is Rs.618 Crores and the time period is 2 years. The Concession Agreement has been kept as 20 years on BOT toll basis.
4.	4-lane connectivity to Dighi & Jaygad Ports in the state of Maharashtra under NHDP Ph under NHDP Ph VII	Dighi & Jaygad Maharashtra	The RFP for feasibility cum Detailed Project Report has been invited with a due date as 28.01.2011 to take up the work on BOT basis.

10.6 National waterways/Responsibility of Central Govt./IWAI

The development and regulation of those waterways which are declared as National Waterways (NWs) by Acts of Parliament becomes the responsibility of the Central Government/IWAI while the remaining waterways continue to be under the domain of respective State Governments. Therefore, for overall development of IWT Sector of the country it is necessary that the Central as well as State Governments simultaneously undertakes the development works.

As of now, there are five NWs

- (i) The Ganga from Haldia to Allahabad (NW-1, 1620 km)- declared in 1986
- (ii) The Brahmaputra from Dhubri to Sadiya (NW-2, 891 kms) – declared in 1988
- (iii) The West Coast Canal from Kottapuram to Kollam with Udyogmandal and Champakara canals (NW-3, 205 kms) – declared in 1993
- (iv) The Kakinada-Puducherry stretch of canals with Godavari and Krishna rivers (NW-4, 1028 kms) – declared in 2008; and
- (v) The East Coast Canal with Brahmani river and Mahanadi delta (NW-5, 588 kms) – declared in 2008.

In addition, declaration of Barak river from Lakhipur to Banga (121 km) as the sixth NW is under consideration of the Government.

10.6.1 IWAI's role in developing National Waterways

IWAI is implementing various projects for making NW-1, 2 and 3 fully functional by providing following infrastructure:

- a) Fairway with 3m/2m/1.5m depth in NW-1, 2m/1.5m depth in NW-2 and 2 m depth in NW-3.
- b) Fixed and floating terminals with access and egress by road/rail.
- c) Facilities for day and night navigation; and
- d) Dredgers/vessels for channel development works

10.6.2 Policy initiative-IWT connectivity to Ports

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 kriver (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.

Every Indian port is facing acute problem of connectivity through rail and road which have been saturated and their capacity expansion is extremely difficult involving complicated issues like land acquisition. Hence, it is necessary that this additional connectivity of ports through IWT is fully exploited as being done in practically every developed country for each port should be conceptualized by the concerned port and necessary investments made therein to exploit their potential.

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.

10.7 PIPELINES

Pipelines account for roughly 30 percent of the port traffic movements in the hinterland. They are the optimal mode for the movement of liquid bulks such as crude oil and petroleum products, and for some bulk materials such as iron ore moved as slurries. A vast network of pipelines already exists for the transportation of petroleum. Currently, almost all crude imports are being moved by pipelines to the refineries. Similarly, LNG imports are carried, after re-gasification at the port, through gas pipelines to consumption centres. Petroleum products on the other hand move equally by pipelines and other forms of land transport i.e. road and rail. Since pipelines fall within the domain of the large oil companies, and are not really dependent on public funding, their development has generally kept pace with requirements.

Indicative mode of evacuation/transportation for respective cargo group.

Cargo Group	Moved by	
	Pipeline	100%
Crude Oil		
POL	Railway	25%
	Road	25%
	Pipeline	50%
LPG	Railway	50%
	Road	50%
LNG	Pipeline	100%
Thermal Coal (Loading Port) (Unloading Port)		
	Railway	100%
	Conveyor	80%
	Railway	20%
Coking Coal	Railway	100%
Iron Ore Mormugao		
	IWT	80%
	Railway	20%
New Mangalore Tamil Nadu Andhra Pradesh Orissa, W.B.	Pipeline	100%
	Railway	100%
	Railway	100%
	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%

10.8 CONCLUSION

This review of port - hinterland connectivity has highlighted some critical issues that need to be addressed and the key challenges with regard to hinterland connectivity facing the ports sector. The following summarizes the essential features for improving hinterland connectivity in Indian Ports:

- a. Railways are presently carrying considerably less than their optimal share of port traffic and road transport has made up the deficit with many negative externalities for road traffic particularly in the major port cities.
- b. As the economy grows and diversifies to higher value manufactures, the optimal road transport share of port traffic will grow. NHAI's port connectivity projects under the NHDP appear to be addressing the needs for Major ports. Ennore and Haldia Ports may require additional connectivity in the immediate future. Considering the growth of non major ports in the recent years, a massive Rail/Road connectivity programme for non-major ports, is recommended
- c. Over the medium term, however, the key to improved port connectivity for India's ports will be enhancements in rail connectivity and capacity, and the latter could require as much as a 400% increase over the present levels of port traffic carried by the railways.

- d. Indian Railways' Dedicated Freight Corridor (DFC) project will help to considerably alleviate congestion in the Delhi-Mumbai corridor, which is critical to the hinterland connectivity of the Mumbai and Gujarat port clusters that serve the largest share of India's port traffic. Feeder lines to DFC from the ports need to be planned/carried out by Railways.
- e. Railways plans for last mile connectivity to various Major and non-major ports need considerable enhancement, and a special effort on this by RVNL to expedite planning and implementation should be initiated on an urgent basis.
- f. In case of those projects which are considered as operationally important by the port but are not found to be financially viable by Ministry of Railways the same can be made viable through grant by the port or by Ministry of Shipping.
- g. Funding of Road connectivity projects should be done by respective ports or by Ministry of shipping.
- h. There is great need for active participation of State Government and Port Trusts with NHAI for land acquisition, Utility shifting and RR matters.

CHAPTER-11

PORT PRODUCTIVITY, EFFICIENCY AND COMPETANCE

11.1 The efficiency with which the port operations are performed in a port depends on the port performance, quality, capability and integration of labour and the equipment deployed for operation etc. This chapter covers various aspects of the port productivity, performance, equipment and human resources development and related aspects and the strategies for the 12th plan period.

11.2 PORT PERFORMANCE – INDIAN VIS-À-VIS GLOBAL EXPERIENCE

11.2.1 In India, when Productivity Parameters in Major Ports are discussed, traditionally, the following parameters are reckoned to assess the effectiveness and efficiency of a major port:

- Average Pre-berthing Detention of Vessels (In hours)
- Average Turnaround Time of Ships (In days)
- Average Output per Ship Berth-Day (In tonnes)
- Average Berth Occupancy (%)
- Percentage of Capacity Utilisation of berths
- Average Gang Output per shift.

11.2.2 Of course, the total traffic, number of vessels and total number of TEUs handled are also computed to indicate how big or small the port is. But, these parameters definitely do not indicate how efficient a port is, unless they are correlated with the number of berthing points a port possesses and the kind of cargo it handles viz., bulk, break-bulk, liquid bulk and containerised cargo. Further, after commissioning of container terminals in the country, calculation of “Average moves per Crane-hour” in each of the terminals, which ultimately shows the productivity of the terminal, was also considered.

11.2.3 However, when internationally acknowledged practices are discussed, the above parameters are not much in vogue in international ports either in Asia, South Africa, Europe or United States. There is no concept of “pre-berthing detention” as such because in world class ports, the capacity is much more than the actual traffic and the planning is also done on those lines.

Hence, there is no question of any ship waiting at anchorage. When average turnaround time is discussed, they may generally be referred to in informal business conversations but not formally calculated since it all depends upon the parcel size of the vessel calling, length of the channel in which pilotage takes place, type of commodity and the mode of discharge/loading. It cannot be generalised as the averages of such anomalous elements only distort the real picture and convey wrong results and interpretations because weightages of different commodities are different in each port. One commonly used parameter which could be attributed to port's internal efficiency is the quantum of cargo that the port discharges/loads from /to a ship in a day which is nothing but Output per ship berth day. However, it will also differ according to the nature of commodity mixes. Still, comparisons could be made commodity-wise and it gives a fair comparison of the ports' handling efficiency. Of course, it does not neither indicate non-shore (water side) efficiency nor reflect whether a port has adequate capacity to serve the demands of traffic/trade. It presupposes that the port has built adequate capacity and no pre-berthing detention accrues.

11.2.4 One parameter widely used internationally is "Average moves per crane per hour". With the advent of full-scale containerization of general cargo all over the world due to its obvious advantages, ports have seen a metamorphosis in terms of commissioning of container terminals in majority of ports in the world. Relatively less emphasis is being given on analysis of handling of traditional bulk cargo since the container vessels are more modern and costly and hence turnaround is generally faster. Hence, many innovative methods and handling systems are being found to achieve more productivity in a container terminal. As a consequence, monitoring of terminal performance takes an important seat and monitoring is done by meticulously watching the performance of Shore Cranes. The best parameter for the purpose is "Average moves per Crane hour". Associated and derivative parameters like Number of moves per hour (meaning total moves of all cranes working for vessel – also known as Vessel throughput per hour) , terminal throughput (meaning the total TEUs handled by the terminal in a day), yard productivity (meaning the number of containers handled in a yard) etc., have subsequently emerged .

This could be a real yardstick to measure and compare the different terminals in the world on an even keel.

11.2.5 A survey of some available literature on the subject does not show any standard Key Performance Indicators (KPIs) defined for the port sector. However, on compilation through various sources of information like UNCTAD Monographs on Port Management, other informal data obtained from respective ports and some articles in shipping magazines, the following position emerges:

PORT	(In TEUs)			
	Crane Productivity for small vessels	Berth Productivity for large vessels	Crane Productivity for large vessels	Berth Productivity for large vessels
Singapore PSA	23	45	36	140
Port Rashid and Jebel Ali	22	40	30	110
Khor-Fakkan, Fujairah	20	32	28	100
Salalah	N/A	N/A	29	90
Aden	N/A	N/A	28	70
India				
NSICT	18	30	22	40
JNPCT	16	24	20	36
Tuticorin	14	14	-	-
Colombo - SLPA	14	23	18	45
Colombo -SAGT	13	25	24-25	
Belgium Ports	-	-	30-35	-
Shanghai	-	-	35	-
International Standards	-	-	27-33	-

11.2.6 If one expands the productivity parameters from Turnaround time to Dwell Time and compare with Port of Singapore, in general terms, the position emerges as follows:

Ports	Dwell Time (days)	Crane productivity (Moves/hr)	Evacuation System	Vessel evacuation rate (Containers/hr)	Turnaround time (days)
Major Indian Ports	3.78	20	Manual	40	1.77
Singapore	0.60	30	Automatic flow – through gate system	100	0.50

11.2.7 It could be seen from the above table, that there is a difference in three chief performance indicators viz., Crane Productivity=> Vessel evacuation rate=> Turnaround time between a world-class port like Singapore and Major Ports in India. The reasons for this variation could be many and some of them are underlined below:

I. Basic physical features

Sl. No.	Indian Port	PSA Singapore
1	The total number of terminals for handling Containers at India's biggest container Port-JNPT is three terminals, having linear Quay length of 1992 meters, adequate for Nine vessels at a time.	PSA Singapore has four terminals having quay length of 11,754 meters which can accommodate about 41 container vessels at a time.
2	The area available at JNPT for the three terminals is about 133 hectares.	The area available at Singapore Port for the four terminals is about 425 hectares.
3	Expansion of area, JNP is dependent acquisition of land behind the terminal the same is fraught with problems of land acquisition and resettlement/rehabilitation.	Though land is scarce in Singapore expansion of terminals is done by reclamation of land from sea and therefore though costly, can be well planned and is not limited by the constraint of land acquisition.
4	The draft at JNPT is (-)13.5 M and there is limitation on latest generation vessels	Maximum draft is more than (-) 16M. And there is no limitation on the most modern and latest generation container vessels.
5	There are drafts limitations in the channel	There are no draft limitations in the channel And biggest ships in the world can visit Singapore Port at any point of time.
6	The total number of quay cranes in about 24 Nos.	The number of quay cranes at the four Terminals at PSA Singapore is 131

II Cargo handling characteristics

The total volume of cargo handled at Indian Ports in 2008-09 was 732.755 million tonnes. In this, handling of container Cargo was only 7.25 mTEUs of which, JNP India's Biggest container port, handled 3.953 mTEUs	The total volume of cargo handled at Singapore in the calendar year 2008 was 515.4 million tons of which, containers handled was 29.92 million TEUs. The volumes therefore are simply not comparable.
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III Level of Mechanization

1	The level of mechanization at Indian Ports is limited and cargo is mainly handled by Conventional means. In container stream, The number of quay cranes, reach stackers, Trailers etc., is far limited.	The level of Mechanization is very high and sophisticated with infusion of latest technology in every sphere of handling of cargo.
2	The equipment is handled by staff deployed at site. The average moves per hour is about 20-25 TEUs. Due to less deployment of cranes, the crane rate (total number of containers loaded to/ Unloaded from a ship in one hour) is about 60-70. This leads to late turn round of vessels and subsequent high dwell time.	The cranes are operated both by staff at site and also automation through Terminals' Control Center. The no. of moves per hour is about 25-39 TEUs. They have the maximum reach across the biggest and widest vessels Due to adequate deployment of cranes, the crane rate achieved is 100 per hour. This leads to quick turn round of vessel and subsequent less dwell time.

11.3 AN OVERVIEW OF PORT PERFORMANCE PARAMETERS

11.3.1 The port performance indicators like average pre-berthing detention , average turn round time and average Ship berth-day output have shown discouraging improvement during Eleventh Plan period in comparison with the same during Tenth Plan period. Port-wise performance during the last year of 10th plan and four years of 11th plan is given at **Annexure - 11.1**, whereas, the summarized performance for the above period for all Major Ports is given as under ;

Port Performance at Glance (From 2006-07 to 2010-11)

Year	Avg. Turn Round Time (in days)	Avg. Pre-berthing Detention (in hours)	Avg. Shipberthday Output (in tonnes)	% Berth Occupancy
2006-07	3.62	10.05	9745	60.42
2007-08	3.93	11.40	10071	64.89
2008-09	3.87	9.55	10473	63.27
2009-10	4.42	11.75	10482	65.92
2010-11	4.67	11.76	10735	65.25

11.3.2 The **Pre-berthing Detention** during the XI plan period has been discouraging and has shown an increasing trend. However, it has shown an improvement during 2008-09 while attaining a figure of 9.55 Hrs. Among the ports, healthy improvements have been observed in Visakhapatnam, Ennore, New Mangalore and Mormugao, whereas in other ports the improvement has not been significant primarily due to non-availability of berths meant for the cargoes like Iron Ore, Coal and Other Miscellaneous & General Cargo continuously for a longer period. However, whatever may be the reason for detention, it ultimately delays the process of operation and adds on to the cost to the vessel owners/agents, as the cost on an average is 2.5 to 3.0 lakhs a day.

11.3.3 As may be seen, the **Turn Round Time** for all Major Ports has increased from 3.62 days during the last year of X Plan to 4.67 days during the fourth year of XI Plan. Among the Ports, Cochin and New Mangalore have shown improvement as compared to other ports during the four years of XI Plan period. It has been observed that the factors affecting turn round time of vessel are, parcel size, cargo mix of the vessels (Container and POL vessels have quicker turn round time because of mechanized handling while break bulk vessels, general cargo vessels take longer time to discharge cargo), distance from Anchorage points to the place of cargo operation, type of equipment, manpower support at the point of loading and unloading, idling at berth due to non-availability of export cargo, poor evacuation/aggregation of cargo from shed/transit area, etc. Better monitoring/co-ordination with vessels' agents/users, improved productivity through induction of modern equipment, skilled manpower and proper infrastructure support can reduce turn round time of vessels. The Working Group, therefore, feels that there is enough scope for reduction in turn round time of vessels at Indian Major Ports by controlling both Port and non-port related factors through better co-ordination, concerted efforts and proper infrastructure support.

11.3.4 The **output per ship berth-day** is also an important measure to indicate how well the ship is handled at the berth. The objective of the port operation being to turnaround the ships as fast as possible, the output per ship berth-day assumes greater significance. The year-wise total output per ship berth-day has already been discussed above. The summarized information on the same for all major ports during last five years is given below:

**Output per Ship Berthday
(From 2006-07 to 2010-11)**

(in tonnes)

Year	Dry Bulk		Liquid Bulk	Break Bulk	Containers	Total
	Conv.	Mech.				
2006-07	4823	23897	18302	1705	11714	9745
2007-08	5390	21790	17623	1525	11744	10071
2008-09	5974	22634	17252	1408	12283	10473
2009-10	5581	21996	16775	1569	12460	10482
2010-11	5467	20072	16594	1659	13444	10735

11.3.5 As may be seen, the output per ship berth-day for all the commodity groups has increased during the XI Plan period from 10071 tonnes in 2007-08 to 10735 tonnes in 2010-11 which was 9745 tonnes in the last year of X Plan period. The maximum increase has been noticed for container vessels which has increased from 11714 tonnes in 2006-07 to 13444 in 2010-11. It is interesting to note that the increase was much higher in the XI Plan period. The reasons for such growth are self-explanatory.

11.3.6 The existing commodity-wise and port-wise norms for output per ship berth-day needs revision/rationalisation by individual ports, as the ports face competition from neighbouring ports and terminals. It is advisable that system of norms for each type of commodity handled by the ports is developed individually. This will be an effective tool in terms of comparison of port performance and thereby adopt appropriate measures to attract or retain the port users/cargo within the port.

11.3.7 Regarding **Berth Occupancy** level, it is evident that at the end of the X Plan it was 60.42%, which has shown a continuously increasing trend climbing to a high of 65.25% during 2010-11.

11.3.8 In addition, detailed analysis has also been made for the output per gang per shift at Major Ports during four years of XI Plan period reveals that there has been a substantial improvement in productivity/output ,which may be seen from the following table :

**Output per Gang-shift
(From 2006-07 to 2010-11)**

(in tonnes)

Year	Iron/ Steel product	Bagged Cargo	Fert. Raw Mat.	Coking Coal	General Cargo	Other Cargo	All Cargo
2006-07	412	287	298	903	290	1010	545
2007-08	441	303	348	803	290	799	570
2008-09	358	324	343	1389	299	823	654
2009-10	424	271	664	1139	312	553	604
2010-11	438	301	445	959	362	641	673

11.3.9 As may be seen the overall productivity as per output per gang-shift has increased from the last year of X Plan i.e. 545 tonnes to 673 tonnes during the 4th year of XI Plan period. The increase in productivity levels have been observed by and large in all the major commodity groups as indicated above. However, as may be seen, the output rates have drastically reduced in other cargo which is attributed to the poor quality of ships' derrick or low productivity levels attained by the ports' equipment itself. The norms for the output per gang-shift need to be updated as shown in **Annexure-11.2** and the measures that are necessary to be undertaken by the Major Ports to improve productivity in order to achieve norms, are given in **Annexure-11.3**.

11.3.10 Taking the overall position of Indian Ports' performance, in order to really improve the performance either port efficiency or labour productivity broad strategies like, creation of port capacity with maintaining a gap of 30% between the installed capacity and the traffic according to the conventional international norms , the drafts at least to 14 mtrs and upto 17 mtrs according to the potential of bigger size vessels calling a particular port, heavy

mechanization programmes adequately with high capacity versatile Cranes, Conveyer Systems, Silos, Harbour Mobile Cranes, Grab Unloaders and Gantry Cranes, Development of Adequate Storage Areas, Hinterland connectivity with minimum 4-lane road connectivity as well as double line rail connectivity etc. could be envisaged.

11.3.11 RECOMMENDATIONS

- Each Port should pay more attention in improvement of productivity – both ship berth-day and gang-shift output further through modernisation, induction of more sophisticated equipment in handling cargo, etc.
- Handling operations in selected areas may gradually be outsourced / privatised for injecting more competition and increasing output.
- Major Sea Ports may maintain a draft of not less than 14 metres and at hub ports a draft of 17 metres.
- Efforts should be made for full mechanization of cargo handling operation and movement in Major Ports
- Development of adequate storage area in the Ports
- Allied infrastructure being more vital and the same may be encouraged, if needed be, through private participation for operation.
- Deployment of manpower as a gang, as per present practice should be done away with. Deployment should be entirely on need based / on ground reality. The notional booking of staff, as prevalent in many ports should be discontinued.
- The existing norms for both ship berth-day output and gang-shift output for different commodities should be revised and new norms compatible with present modern handling facilities be fixed.
- A Committee at the Ministry / IPA level may be appointed to examine the existing norms and recommend revised norms.
- All out efforts should be made to reduce Pre-berthing Detention and improve Turn Round Time of vessels through minimization of both Port and non-Port related factors.
- The projections for the 12th Plan period for performance parameters like Pre-berthing detention, turn round time, average output ship berth day

and berth occupancy has been prepared after the consultations with the port keeping in view the traffic and capacity levels as projected for the 12th five year plan period Plan. The projections are as under:

A. Average Pre-Berthing Detention of Vessels

(In Hours-Port account)

Category	2010-11 (Actual)	2016-17 (Target)
Liquid Bulk	9.69	3.87
Dry Bulk (Conv.)	24.95	9.98
Dry Bulk (Mech.)	5.02	2.00
Break Bulk	15.11	6.04
Container	11.75	2.35
Total (All working Vessel)*	11.76	4.70

B. Average Turn Round Time of Vessels

(In Days-Port account)

Category	2010-11 (Actual)	2016-17 (Target)
Liquid Bulk	1.88	0.75
Dry Bulk (Conv.)	4.52	1.81
Dry Bulk (Mech.)	2.45	0.98
Break Bulk	3.98	1.59
Container	1.94	0.78
Total (All working Vessel)*	2.66	1.06

C. Average Output per Ship Berth-day

(In Tonnes)

Category	2010-11 (Actual)	2016-17 (Target)
Liquid Bulk	16954	22040
Dry Bulk (Conv.)	5467	7655
Dry Bulk (Mech.)	20072	28100
Break Bulk	1659	2325
Container(Tonnes) (TEUs)	13444 (516)	17477 (670)
Total (All working Vessel)*	10735	14600

D. Percentage of Berth Occupancy (in %)

(working Vessels/Barges, etc)

2010-11 (Actual)	2016-17 (Port Projections)	2016-17 (Target)
65.25	69.61	70.00

Note: (*) : Total for all vessels figures indicate only the weighted average and not for comparison of performances.

11.4 SURPLUS EQUIPMENT, MEASURES FOR QUICK DISPOSAL AND MAINTENANCE REQUIREMENT

11.4.1 Port Cargo infrastructure consists of cargo handling equipment which includes:

- Quayside equipment (ship to shore and vice versa)
- Shore to yard equipment
- Yard to final evacuation mode (rail, road or conveyor)
- Miscellaneous equipment
- Port connectivity infrastructure

11.4.2 The cargo infrastructure is an important determinant of the port handling capacities. The cargo discharge rates/handling rates as well as percentage availability versus percentage utilization is used to gauge the efficiency of these equipments. Ministry of Shipping was laid down the norms to measure the availability and utilization of cargo handling equipment.

11.4.3 It has been observed that the utilization of equipment is not adequate. The high traffic growth figures as well as high berth occupancies across ports indicate that there is no dearth of cargo to be handled at any berth. This indicates a flaw in the material handling facilities at major ports that needs to be rectified. Moreover, certain norms were laid down by Ministry of Shipping, so as to peg the useful economic life of mechanical equipments at a port. An analysis of existing equipments at the major ports in light of these norms showed that a majority of the equipments in use at major ports are obsolete. The main problems in using such old equipment are:

- Such equipments offer low handling rates as compared to similar equipments currently available in the market.
- The down-time for such old equipments is higher as compared to newer equipment
- The maintenance cost of such equipments is high
- Operational expenditure is high if old equipments are used. Technological innovations have resulted in construction of lighter and energy efficient machinery.

11.4.4 Even though there are well defined procedures for the procurement of equipment, whether it is low valued or high valued, there is no definite policy yet for the replacement of the equipment in the ports. This is due to various reasons such as non availability of information on total maintenance cost, absence of general guidelines for replacement, lack of proper accounting for inflation, etc. however, in the present system of replacement decisions in the ports, replacement is decided based on the life “fixed” by the Ministry of Shipping. A comparative study of port equipment reveals that in spite of expiry of prescribed life span of some equipment, they are still in service. It specifies that in practice the actual life span can vary depending on working conditions, environmental factors, hours worked actual duty etc.

11.5 Recommendations

11.5.1 The recommendations are focused on two aspects of Inspection & maintenance (I&M) at Major ports:

- Founding principles laid out in the Maintenance Manual and
- Various aspects of I&M management and execution.

11.5.2 Maintenance Manual

In a number of cases, the maintenance manual provided by the manufacturer will be insufficiently detailed. This is a result of the pressure to keep prices to a minimum, since such manuals can be very expensive to prepare. It would be wrong to demand too detailed information if the cost of this is going to be added to the purchase price. Nevertheless, the following information should be provided, whether or not it is published formally in a manual:

- (a) Operating instructions;
- (b) Servicing schedules and required repair standards;
- (c) Spare parts lists, with identifying illustrations;
- (d) Sets of drawings, especially of parts subject to wear that may be manufactured on site, for example, renewable liner plates for ship-loader chutes;
- (e) Specifications for any special tools and jigs required for maintenance purposes.

11.5.3 I&M Management and Execution

The Maintenance Manual does not explicitly state the I&M objectives. It only provides a “Guiding Principle Statement”. The principle statement states that port will undertake to maintain its infrastructure at optimal condition and functionality at minimum life cycle cost. In a well managed port operation, maintenance work is identified before equipment breaks down in one of the following ways:

11.5.4 Inspections

- Some assets require more frequent inspections, daily, weekly or monthly. A move should be made to this effect. These inspections are just as important as the “annual” inspection.
- Ideally, inspections should not be done by people doing the repairs. This is in order to avoid the problem of people not reporting on their own poor workmanship.
- Manufacturer/ designer requirements for each asset (group) should be listed to ensure all I&M requirements are being met.
- Electrical safety rules should be continuously updated and made available on a portable device. This allows for easy and continuous access.

11.5.5 Statutory inspections

- All statutory inspections and other legal requirements should be identified. This should be done as a matter of priority to ensure compliance to legislation.
- Statutory inspections should be scheduled to take precedence over routine work.
- Where necessary, inspectors should be hired for statutory inspections. It eases the workload of the I&M department and ensures that no statutory inspections are missed.

11.5.6 Planning & scheduling

The basic concept of maintenance planning is to identify required work, plan the resources required for it to be accomplished, and schedule it to be accomplished under controlled conditions when it will have the least effect on cargo handling operations. In many existing port operations, this approach is not used. All too often the work is identified when equipment breaks down when it is urgently needed for ship loading/unloading, and the maintenance work force reacts as best it can under far less than optimum conditions.

- In order to clearly define and separate the two functions, it is recommended that planning be used for long term activities and scheduling for daily/weekly work.
- Maintenance or repair issues identified in inspections should be ranked by significance as well as by urgency for remedial action.
- Safety related issues should be given special prominence in the record.

11.5.7 Computerized Maintenance Management System

- Full advantage should be taken of “System Application and Products” (SAP) especially, if it is already integrated with human resources, procurement and financial management.
- Pressure should be put to ensure that the maintenance module is used, as the benefits are overwhelming. Some of the known benefits of using a Computerized Maintenance Management System (CMMS) are highlighted below:
 - It facilitates data sharing between ports,
 - Easily generated and accessed records of I&M activity,
 - It is vital for the generation of Key Performance Indicators (KPIs),
 - Helps generate data for improving productivity of the work force,
 - Facilitates reliable control of contractor resources and
 - Provides useful records of health, safety, environment and safety issues, particularly useful in the event of accidents
- It should be noted that it takes years and tremendous effort to get such a system up and running. The entire I&M team have to fully understand the value of using the system and acknowledge that it is essential in I&M management.
- The CMMS should be set to ensure that records can generate a logical trail of data.
- When fully implemented the CMMS can be almost paperless. During the development of the CMMS however the generation of paper should be strenuously controlled. There is a tendency to generate too much paper for people to read during this time which could ultimately result in failure of the system.
- The CMMS should be both a planning/ recording tool and a facilitator for improving scheduling of resources and for cost management.

11.5.8 Communication lines

- In order to raise the importance of I&M regular meetings with the general port management to discuss I&M performance should be introduced.
- Regular meetings between the I&M teams and terminal operators to discuss I&M matters should also be conducted.

11.5.9 Contract management

- For cases where emergency work is required, there should be a mechanism to bring in vetted contractors quickly.
- A list of possible contractors that could be used for I&M work should not only have vetted financial assessments but safety assessments as well. This will help ensure compliance to legislation during actual I&M work.
- Contract management requires specific engineering management knowledge. This knowledge should be available within I&M departments to allow meaningful contract management.
- The deployment of small contractors to handle some of the I&M may be a useful policy for the port. The contractors would however need continuous management as they can be prone to generating more problems than larger firms.

11.5.10 I&M costs

- I&M costs associated with regulatory compliance & preventative maintenance should be separately identified. It helps to monitor where the bulk of I&M spending is. It is valuable for formulating improvements.
- Cost records should be used to compare actual labour and materials cost of I&M tasks with planned costs.
- Cost records should also be used to log I&M costs for each asset in order to provide an indication of cost trends.

11.6 HUMAN RESOURCE DEVELOPMENT AND SKILL ENHANCEMENT

11.6.1 Indian Port Sector has undergone substantial technological developments during the last 5 decades or so and there is continuous endeavor to further upgrade the same to match world class standards. However, the categories of manpower deployed and the manning scales for handling different types of cargo, which have evolved decades back have not changed much resulting in high manning and consequently inflating the cost of operations. The total manpower at the eleven major port trusts(excluding EPL) as on 31.3.2011 was 56067. Though the port manpower have substantially reduced over the last decade by over 50%, yet it is still high The break-up of the manpower is broadly as under :

Officers	:	5%
Non-cargo handling employees	:	60%
Cargo handling workers	:	35%

11.6.2 Rationalisation of manpower

11.6.2.1 As per the Bipartite Wage Settlement dated 2.8.2000 reached between Port Management and five Major Labour Federations, the issues of manning was referred to the National Industrial Tribunal for adjudication. The Tribunal deliberated upon all the issues and after a detailed analysis, announced its Award during April 2006 which was notified in the Gazette in June 2006. As per the Award, the deployment of workers has been rationalized keeping in view the type of cargo handled and manning of equipment and craft. However, the Award is yet to be implemented in some of the ports.

11.6.2.2 Presently, deployment of manpower at various ports differs even for handling the same type of cargo or utilizing the same type of equipment. Measurement of productivity is in terms of gang-shift output which does not correctly reflect the individual effort. Further, the role and responsibility of the equipment operator alongwith his skill set is not fully recognized.

11.6.2.3 The area where the labour involvement is most is in the handling of general or break bulk cargo, which is performed by workers and output is measured in terms of gang. The manning scale of this 'gang' varies from port to port but is constant for handling different types of cargo at the individual port.

11.6.2.4 Another important aspect is the aging manpower, especially the cargo handling workers. In most ports, especially the older ports of Mumbai, Kolkata, Chennai, etc, there has been almost no addition to manpower for nearly the past 3 decades resulting in the present workforce is having a high average age of 50 years. This workforce is thus resistant to any change.

11.6.2.5 Thus, implementation of the Award of the National Tribunal needs to be ensured to bring the manning scales to the desired level and consequently improve efficiency and productivity. Further, it will then be possible to identify the surplus staff for retraining/redeployment.

11.6.3 Surplus manpower

11.6.3.1 The general perception is that Major Ports have large surplus manpower is true especially in respect of older ports in relation to the quantum of cargo handled resulting in high operating ratio and cost per tonne. On the other hand, there is a situation of shortage of manpower in certain areas despite a surplus in other areas, creating skills gaps in many areas of operation.

11.6.3.2 The implementation of the Award of the National Tribunal is the first step to rationalizing the manning scale. This will release the surplus manpower in the cargo handling workers and to some extent in the categories of equipment, operators and craft crew under the non-cargo handling group.

11.6.3.3 However, it is also necessary to study and analyse the optimum requirement of employees in other areas of support services, e.g. shed staff, maintenance staff and office ministerial staff. With more computerization, requirement in these areas also undergoes a change.

11.6.3.4 The surplus manpower available for redeployment can be trained and so redeployed. However, considering the large number of the port labour including the cargo handling workers are so academically advanced and their age profile, scope of such retraining and deployment is limited. Thus, the release through Special Voluntary Retirement Scheme or Golden Handshake is the best alternative. The Scheme as extended earlier in the port sector in the years 2001 and 2003 provides adequate compensation and would lead to a win-win situation. In case the above Scheme does not have the desired result, alternate of retrenchment by following the process under the Industrial Disputes Act may be resorted to.

11.6.3.5 Simultaneously, there has to be fresh intake in a phased and planned manner so as to induct fresh talent and expertise in the organization and ensure continuous availability of the appropriately trained and skilled manpower in the future.

11.6.4 Training and Redeployment

11.6.4.1 With rationalization of manning scales, more issues arise including preparing the labour for this major change. These factors lead to focus attention on training the employees continuously to meet the changing needs as also redeployment of the likely surplus after retraining. Earlier Training Institutes, namely the Indian Institute of Port Management, Kolkata, and the National Maritime Academy, Chennai, to some extent catered to the Port's training requirements, mainly of the officers and the supervisory staff. Presently, with the setting up of the Indian Maritime University, these institutes are part of the University and can now provide more detailed training with academic recognition. However, the training requirements of the Class III/IV workers and staff has to be at port level through own training institutes/set-up or mostly on the job.

11.6.4.2 With the changes in the port scenario and introduction of high capacity port equipment, the focus has to be on training and retraining at all levels. There is need for training programmes designed for training each and every category. In addition, specific programmes need to be designed for retraining and multi-skilling to facilitate redeployment of the surplus workforce. Training of surplus or redundant non-technical manpower in technical fields and multi-skilling of skilled workmen is important in view of the rapid and intense technological changes and will help in minimizing the adverse impact of obsolescence and rationalization of manpower.

11.6.4.3 Learning and upgradation of knowledge is an ongoing process. However, structured training provides an opportunity of growth both for the employees and the organization. Training has to commence with induction and be mandatory at various levels as per defined periodicity for each level and a requirement for promotion to meet the demands of that post. Broadly, training would be in following areas -

- (1) Induction
- (2) Skill enhancement
- (3) New Systems/equipment (at time of promotion/upgradation)
- (4) Attitudinal improvement

- (5) Multi-skilling
- (6) Technical upgradation

11.6.4.4 Identification of training gap in the performance appraisal is necessary and needs to be used as a tool. It is also suggested that IMU, in collaboration with reputed institutions in the world who are expert in Port Sector, may do a gap Analysis – Transfer need Analysis for each segment of each port and develop tailor made module for such segment so that the employees will be in line with times.

11.6.5 Remuneration and incentives

11.6.5.1 The present incentive schemes are limited mainly to cargo handling workers, operators and allied staff (previous scheme). The norms or datums were fixed several years back and are unrealistic for the present day output. Despite wage revision settlement providing for review and updation of datums on average of last 3 years, there is a tendency of unions to oppose the efforts made by ports to review/revise the datum. These datums and the system of incentives thus need to be reviewed and revised to have schemes which will reflect the time reality, benchmark the performance and provide real incentive for improving the productivity and efficiency.

11.6.5.2 In the present system, the remuneration package is decided across the ports and for all categories by the Bipartite Wage Negotiation Committee set up by the Government with equal representation of workers and employers. At this level, pay structure, allowances and service conditions are all decided. However, local issues of improvements are not taken up at this level and left to be discussed at the Port level. However, with the remuneration package having already been decided and implemented, it may appear that the port administration is left with no bargaining power to get the worker representatives to the negotiating table to discuss issues of change and improvement. Thus, efforts at local level, sometimes, are not successful and issues linger on.

11.6.5.3 A policy decision needs to be taken at the Government level to allow the individual Major Ports to decide on the remuneration package and

incentives alongwith other aspects in totality. Towards this, broad guidelines can be given by the Ministry of Shipping as is the prevalent in case of Public Sector Enterprises. This would give the port management the much required bargaining power. Alternately, the pay revision should be by appointment of a Pay Commission which would consider all issues in totality and ensure there is both 'give and take' while deciding the remuneration package.

11.6.6 Performance Appraisal

11.6.6.1 Capacity building efforts through training hinge on laying performance standards, conforming to them through proper appraisal and rewarding them through transparent incentives at the right time. Presently, at major ports there is practically no incentive linked to performance of the employee (except the piece rate/premium scheme for cargo handling workers). Further, performance appraisal through the system of Annual Confidential Reports is limited to officers and Class III employees and the formats are routinely filled and assessed. While the formats clearly provide for mentioning significantly higher achievements and shortfalls and constraints, there are neither incentives for higher achievements nor disincentives for shortfall.

11.6.6.2 An employee cannot but get into a laid back attitude to work and performance unless there is something distinct to aspire. Thus, there need to have incentive or rewards scheme linked to performance. Further promotions and progress in the organization must also meet the aspirants of performance through a transparent and built-in mechanism in the performance appraisal system. Towards this, it is necessary that targets are defined and shared at the beginning of the year so that the employee would know that he would be measured by them at the end of the year. There is also need to review and revise the formats to have objective and transparent appraisal system in discussion with the employee being assessed.

11.6.6.3 With the changing scenario, both internal and external , there is need to redefine job description for each level. This needs to be proceeded by a job analysis so as to ensure effective use of the human resource. There is a need to build an All India Port Cadre of all the Major Ports especially for

officers, which would provide better opportunities for better growth through varied experience. This cadre would facilitate appointment of port professional to the post of Chairmen/Dy Chairmen as has been recommended by various Committees' including the World Bank in its report on "Indian Port sector". This would bring the Port Sector at par with other infrastructure sector like Railways, Power, Roads and also with other PSUs like Oil, steel, coal, etc. It will also ensure mobility of Port officers and share best practices learnt in each Port and at the same time, this policy make them not to build strong roots in a port and other consequential disadvantages. Simultaneously, cadre structuring becomes important as cadre hierarchy ranks have come under challenge and are being flattened. However, cadre management is important to ensure that consistent with the maintenance of morale, the cadre is recruited, trained and utilized in a manner calculated to fulfill its objectives. It is thus necessary for each port to carry out this exercise and ensure that employees are informed of their job description and expectations. A working Group was constituted by the Ministry to examine and suggest appropriate measures for exploring the possibility of capacity building of Port employees. Working group recommendations has been approved by the government for compliance by all Major Port Trusts.

11.6.6.4 Indian Ports suffer, many-a-time, from inadequacy of pilots to navigate the vessels in their channels. As a result, ports are unable to achieve zero pre-detention time for vessels and long-waiting of vessels are also common in ports. It is advisable to start a three year pilots course consisting of 1 years theoretical training in Indian Maritime University and 2 years practical on-the job-training in ports so that a candidate can be given a pilot licence by the Government, after successful completion of course, to pilot vessels in any port. These pilots can move from one port to another.

11.7 RECOMMENDATIONS

- The Award of the National Tribunal needs to be implemented uniformly at all ports to bring the manning scales at the desired levels.

- As recommended in the Award, deployment of manpower as a gang should be done away with and deployment should be entirely on need based/on ground reality. Notional booking of staff as prevalent in many ports should be discontinued.
- There should be round the clock working all 24 hours with overlapping shifts and hot seat exchange so that idle time on port account is reduced to very minimum.
- Uneconomic or long-standing practices coming in the way of efficient operations should be identified and reviewed to bring down cost of cargo handling.
- Individual ports to be allowed to negotiate wage revision/remuneration package as a whole including some conditions and other changes required so that there is a proper bargain through give and take; alternately, this be through a Pay Commission which will consider all issues prescribed by the ports.
- The existing output norms to be reviewed and revised compatible with the present facilities at the ports.
- Incentive Schemes including the datum under the present schemes should be reviewed and revised to be real time.
- Surplus manpower to be identified by individual ports for retraining and redeployment.
- Special Voluntary Retirement Scheme should be extended to the categories where there is identified surplus to achieve the desired numbers.
- Training has to be an integral part of employee development from induction and at defined levels and periodicity. Completion of training has to be an essential requirement for further promotion/upgradation.

- Specific training programmes be devised for retraining of surplus and multi-skilling.
- IMU should be collaborated with international Institute to carried out a gap analysis –Training Need Analysis for each segment.
- System of performance appraisal should be reviewed to be more effective as a tool to assess performance as well as motivate the employees to aspire.
- The Annual Performance Appraisal formats to be revised to have a more objective and transparent appraisal with assessment through mutual discussions.
- System of incentive/rewards should be introduced to recognize high achievers.
- Job analysis exercise be carried out job descriptions redefined for each level and made known to each employee so that he is aware of his duties and what is expected of him.
- Each port is to carry out an exercise of cadre restructuring and review of hierarchy, keeping in view the required cadres and promotion levels.
- There is a need to build an All India Port Cadre of all the Major Ports especially for officers, which would provide better opportunities for improved career progress through varied exposures/experience. This cadre would facilitate pooling of professional resources as also appointment of port professional to the post of Chairmen/Dy Chairmen as has been recommended by various Committees' including the World Bank in its report on "Indian Port Sector". This would bring the Port Sector at par with other infrastructure sector like Railways, Power, Roads and also other PSUs like Oil, Steel, Coal, etc.

11.8 CORPORATE SOCIAL RESPONSIBILITY (CSR)

11.8.1 Government of India has issued guidelines on Corporate Social Responsibility applicable to Central Public Sector Enterprises (CPSEs) in March 2010. The extract of the guidelines are given at **Annexure – 11.4**

11.8.2 The Corporate Social responsibility encompasses the sectors like health, education, employment, income and quality of life. It should be binding on the corporate sector to work on the above aspects, which are thought to be primary social indicators. The concept of corporate social responsibility (CSR) has so far failed to take deep root in India. Much needs to be done to bring changes in attitude towards CSR and bring awareness among the corporate about their social responsibilities. The Department of Public Enterprises (DPE) has prepared guidelines for central public sector enterprises to take up important corporate social responsibility projects to be funded by 2-5 per cent of the company's net profits. Nearly all the major ports in India are involved in CSR programmes in areas like education, health, staff quarters, skill development, and training. Major Ports are also promoting encouragement to the outstanding children of port employees through scholarships etc. However, much more could be done. A policy on CSR applicable to the Major ports to be prepared at the earliest, so that during 12th Plan period, the same could be implemented.

11.8.3 Port Trusts, by virtue of Section 88 of the Act, are required to spend monies only on the purposes mentioned therein, which are basically port-related purposes. But, a Port Trust, in terms of clause (l) of Section 88, can spend their monies on “any other charge which may on the application of the Board or otherwise be specifically sanctioned by the Central Government....”.

11.8.4 It is recommended that Ministry of Shipping may issue instructions to Port Trusts under Section 111 that a certain percentage of Net Surplus(after appropriations) may be earmarked by the Port Trusts in their Budgets towards Social Responsibility and spend this money after sanction by the Central Government under Section 88 (1)(l), duly making an application.

PORT PERFORMANCE AT A GLANCE Annexure 11.1
(DURING 2006-2007 TO 2010-2011)

Port	Period	Traffic Handled (In MT)	AV.TRT (Total) (In Days)	AV. Pre-Berthing Detention (Port A/c) (In Hours)	AV. Ship Berthday Output (In Tonnes)	% Berth Occupancy
1	2	3	4	5	6	7
<u>KOLKATA</u>	2006-2007	12.60	3.89	0.12	4490	45.48
	2007-2008	13.74	4.87	0.24	3702	59.20
	2008-2009	12.43	4.60	1.27	3481	57.28
	2009-2010	13.04	5.47	5.81	2273	70.80
	2010-2011	12.54	5.37	3.45	2608	68.27
<u>HALDIA</u>	2006-2007	42.45	3.97	26.16	8770	85.05
	2007-2008	43.59	4.26	33.36	8353	84.07
	2008-2009	41.79	4.21	24.48	7732	83.62
	2009-2010	33.38	5.01	33.36	6243	0.00
	2010-2011	35.00	4.53	25.68	6563	79.61
<u>PARADIP</u>	2006-2007	38.52	3.54	1.41	11795	65.00
	2007-2008	42.44	5.54	1.48	11181	77.00
	2008-2009	46.41	4.78	1.30	12635	71.00
	2009-2010	57.01	9.04	1.29	13853	78.00
	2010-2011	56.03	7.73	2.51	14243	74.00
<u>VIZAG.</u>	2006-2007	56.39	3.65	4.78	10872	59.00
	2007-2008	64.60	3.91	5.10	10600	72.00
	2008-2009	63.91	3.93	4.35	11171	67.00
	2009-2010	65.50	4.78	18.96	10470	77.00
	2010-2011	68.04	5.84	2.28	10336	80.00
<u>ENNORE</u>	2006-2007	10.71	1.89	0.31	35087	34.00
	2007-2008	11.56	2.08	0.75	35251	35.00
	2008-2009	11.50	2.35	0.73	28429	47.00
	2009-2010	10.70	2.35	0.42	21565	41.00
	2010-2011	11.01	2.78	0.01	17684	35.00
<u>CHENNAI</u>	2006-2007	53.41	43.40	0.80	10165	63.00
	2007-2008	57.15	4.55	0.96	10385	74.00
	2008-2009	57.49	6.16	0.93	10970	67.00
	2009-2010	61.06	4.72	0.98	11843	65.00
	2010-2011	61.46	4.36	0.97	11292	63.00

<u>TUTICORIN</u>	2006-2007	18.00	3.67	3.36	5318	67.63
	2007-2008	21.48	3.80	4.32	5348	73.00
	2008-2009	22.01	3.66	3.36	5574	70.16
	2009-2010	23.79	3.97	9.60	6505	72.30
	2010-2011	25.73	4.11	9.36	6511	71.57
<u>COCHIN</u>	2006-2007	15.26	2.19	0.29	8282	67.00
	2007-2008	15.81	1.99	1.21	10881	66.00
	2008-2009	15.23	2.14	1.31	10599	63.54
	2009-2010	17.43	2.08	2.38	10829	63.71
	2010-2011	17.87	2.20	4.57	11752	70.45
<u>NMPT</u>	2006-2007	32.04	3.14	1.20	13078	47.00
	2007-2008	36.02	3.21	2.00	12664	56.00
	2008-2009	36.69	3.00	1.00	13644	54.00
	2009-2010	35.53	3.06	1.00	13895	52.00
	2010-2011	31.55	2.71	1.00	14205	55.00
<u>MORMUGAO</u>	2006-2007	34.24	4.47	19.34	17799	81.00
	2007-2008	35.13	4.03	18.35	17106	74.00
	2008-2009	41.68	3.61	11.48	20797	70.00
	2009-2010	48.85	5.63	19.70	18618	79.00
	2010-2011	50.02	6.46	14.18	17314	78.00
<u>MUMBAI</u>	2006-2007	52.36	4.51	5.22	6472	53.09
	2007-2008	57.04	4.20	5.07	7196	60.41
	2008-2009	51.88	4.76	7.37	6156	64.12
	2009-2010	54.54	4.61	7.22	7125	59.86
	2010-2011	54.59	4.38	8.18	7487	58.67
<u>J.N.P.T.</u>	2006-2007	44.82	1.67	5.75	16727	71.22
	2007-2008	55.84	1.85	10.33	20171	64.75
	2008-2009	57.29	1.97	9.84	22472	68.66
	2009-2010	60.76	2.02	6.48	25627	66.66
	2010-2011	64.31	2.67	13.68	24849	72.66
<u>KANDLA</u>	2006-2007	52.98	5.46	35.28	9843	72.00
	2007-2008	64.92	5.13	32.64	11082	72.00
	2008-2009	72.23	5.20	28.08	12998	67.00
	2009-2010	79.50	5.03	22.80	13372	72.00
	2010-2011	81.88	5.90	36.24	13843	70.00
<u>ALL PORTS</u>	2006-2007	463.78	3.62	10.05	9745	60.42
	2007-2008	519.32	3.93	11.40	10071	64.89
	2008-2009	530.54	3.87	9.55	10473	63.27
	2009-2010	561.09	4.42	11.75	10482	65.92
	2010-2011	570.03	4.67	11.76	10735	65.25

Annexure- 11.2**RECOMMENDED PRODUCTIVITY NORMS FOR
VARIOUS DRY CARGO COMMODITIES****(Tons per hook or crane or machine/hour)**

SL. NO.	CATEGORY COMMODITY	Norms for Handling
I.	BREAK BULK	
(i)	Steel & Bagged cargo	4000 tons/day
(ii)	Other	2500 Tons/day
II.	LIQUID BULK	
(i)	Crude	5000 Tons/hour
	POL Product	1000 Tons/hour
	LPG/LNG	250 Tons/hours
	Other Liquid	300 Tons/hours
III.	DRY BULK	
(i)	Coal, Lime Stone, Minerals	7500 Tons/day for lower parcel size vessels
(ii)	Iron Ore	Cape Size – 60,000 tons/day Panamax- 55,000 tons/day Handymax- 25,00 tons/day
(iii)	Foodgrains & Fertilizer	1000 tons/day for vessel of more than 3000 tons parcel size

MEASURES TO IMPROVE LABOUR PRODUCTIVITY

CARGO CATEGORY: Break bulk

Commodity	Measures
(i) Steel Coil	<p>(i) High capacity (20 to 25 tonnes) shore cranes or shipboard cranes to be used.</p> <p>(ii) Appropriate and specialized sling like “C” hook to be used.</p> <p>(iii) Depending upon the size and unit weight, the sling should be loaded with as many coils as the safe working load of the crane and the sling will permit.</p> <p>(iv) Both on shore as well as in the hatch heavy duty forklifts with boom attachment to be deployed for lifting, moving and stacking of the coils.</p> <p>(v) Loading and stowage to be planned well ahead based on weight and destination of the coils, by preparing a stowage plan and loading sequence list. Similar advance planning to be done for discharging.</p> <p>(vi) Separate workers to be deployed for lashing and unlashng.</p> <p>(vii) Quay transfer distance to be kept as short as possible. Sufficient number of trailers should be mobilized.</p> <p>Idle : Not to exceed 10%</p> <p>Recommended Productivity : 200 tonnes per hour @ 3 minutes per cycle and 10 tonnes per lift.</p>
(ii) Steel Products (Pipes, angles, plates, beams, etc.)	<p>(i) Meticulous planning to be done in advance to decide the sequence of loading/discharging, type and number of stevedoring gear, equipment, vehicles and the workers required for each hatch, taking into account the stowage position of the cargo.</p> <p>(ii) Specialised and appropriate sling to be used for each type of steel product.</p> <p>(iii) Depending on the capacity of the lifting gear (shore crane or ship’s crane), maximum number of pieces should be lifted in each cycle.</p> <p>(iv) Sufficient number of trailers to be used for quay transfer operation with adequate number of mobile mechanical equipment (forklifts/mobile cranes, etc.) stationed</p>

	<p>at the stacking point.</p> <p>(v) Skilled workers should be posted for guiding and signaling the packages as they are lifted into or out of the hatch.</p> <p>Idle : Not to exceed 20%</p> <p>Recommended productivity : 90 tonnes per hour @ 4 minutes per cycle and 6 tonnes per lift.</p>
<p>(iii) Unit load (bundle/ wood pulp/ingots/pallets pre slung cargo/jumbo bag etc.)</p>	<p>(i) Appropriate and customized sling to be used.</p> <p>(ii) Depending upon the size and weight on the package, at least 3 to 4 units to be lifted per cycle.</p> <p>(iii) Sufficient forklifts to be deployed on shore as well as in the hatch for transfer of cargo between the hook point/hatch square to storage area/stowage position.</p> <p>Idle : Not to exceed 10%</p> <p>Recommended productivity : 100 tonnes per hour @ 3 minutes per cycle and 5 tonnes per lift.</p>
<p>(iv) Timber log</p>	<p>(i) Custom-made sling with special attachment to be used.</p> <p>(ii) Based on the size and weight of the logs, as many pieces as the rated capacity of the sling and the crane to be lifted in each cycle.</p> <p>(iii) Based on the transfer distance, sufficient number of trailers to be mobilized for the quay transfer.</p> <p>(iv) For each hook, at least 2 mobile cranes should be deployed at the stacking point.</p> <p>(v) Skilled and experienced signalmen to be posted on board the ship to guide the sling as it is maneuvered out of the hatch.</p> <p>Idle : Not to exceed 15%</p> <p>Recommended productivity : 60 tonnes per hour @ 5 minutes per cycle and 5 tonnes per lift.</p>

<p>(v) Bagged Cargo</p>	<p>(i) Either jumbo net slings of capacity between 5 and 10 tonnes or stevedoring pallet to be used.</p> <p>(ii) If net slings are used, trailer or trucks to be deployed for quay transfer operation by lowering the sling directly on the truck (in import operation) or by making the sling on the wharf by dumping the bags onto it from the trucks (in export operation).</p> <p>(iii) Multiple slings to be made up on the quay simultaneously if jumbo sling method is used.</p> <p>(iv) Sufficient workers to be detailed at the Shed/Godown loading/unloading the trailer.</p> <p>(v) If stevedoring pallet is used, sufficient forklifts to be used on the quay or in the hatch with adequate number of workers at the storage/stowage point for emptying the pallet.</p> <p>Idle : Not to exceed 20%</p> <p>Recommended productivity : 100 tonnes per hour @ 3 minutes per cycle and 5 tonnes per lift.</p>
<p>(vi) Mixed General Cargo</p>	<p>(i) Depending upon the type of packages the stevedoring gear (slings) that will give maximum output to be utilized. It is preferable to choose a sling that can accommodate different types of package without damaging each other, and at the same time, transfer a good load of cargo in each cycle.</p> <p>(ii) The sling should be filled to the maximum volume but without exceeding the rated capacity of the crane or sling.</p> <p>(iii) No sorting of packages to be done on the quay. It should be done invariably in the shed/open area.</p> <p>Idle : Not to exceed 20%</p> <p>Recommended productivity : 60 tonnes per hour @ 5 minutes per cycle and 5 tonnes per lift.</p>

CARGO CATEGORY: CONTAINER

Measures	
(i)	Strict cut off to be enforced for receipt of export containers.
(ii)	Hot seat exchange system to be followed for Gantry Crane Drivers
(iii)	For each crane, a separate lane to be designated for trailer movement and strict lane discipline to be maintained.
(iv)	Cranes to be equipped with twin spreaders for lifting two containers at a time.
(v)	Minimum two yard equipments to be mobilized for each gantry crane.
(vi)	In the case of containers discharged by ship's gear, container should preferably be landed on the trailer but not on the quay and then picked up by Reach Stacker for
(vii)	transfer to the container yard.
(viii)	No tally, seal checking, etc. to be done on the quay. All these activities should be done only at the container yard.
(ix)	Adequate back-up area to be made available.

Annexure-11.4

CSR IMPLEMENTATION – Extracts from CPSEs Guidelines

11.4.1 CSR initiatives of Central Public Sector Enterprises (CPSEs) should consider the following parameters for identification/selection of schemes/projects:

- (i) Thrust should be given wherever possible to areas related to the business of the CPSEs as a natural corollary to the business.
- (ii) Investment in CSR should be project-based. Mere donations to philanthropic/charity or other organizations would not come under the category of CSR.
- (iii) CSR activities should generate community goodwill, create social impact and visibility.
- (iv) For every project, the time-frame and periodic milestones should be finalized at the outset.
- (v) CSR activities should also involve the suppliers in order to ensure that the supply-chain also follows the CSR principles.
- (vi) CSR activities should help in building a positive image of the company in the public perception.
- (vii) CSR activities may be related to United Nations Global Compact Programme on Environment.
- (viii) CSR projects may be closely linked with the principles of Sustainable Development, based on the immediate and long-term social and environmental consequences of their activities.
- (ix) Every CPSE should shoulder responsibility for restoring/compensating for any ecological damage that is taking place as a result of its operations.

- (x) Care may be taken to ensure that CPSEs work towards fulfillment of the National Plan goals and objectives, as well as the Millennium Development Goals adopted by our country, ensure gender sensitivity, skill enhancement, entrepreneurship development and employment generation by co-creating value with local institutions/people.
- (xi) Central Public Sector Enterprises should redefine their business continuity plan to factor in hazards, risks and vulnerabilities. They should also create value in innovative social investments in the community and may focus on the areas of “Preparedness and Capacity Building” in Disaster Management (DM).
- (xii) Public-Private Partnership between the Government and the Central Public Sector could also be encouraged to leverage the strengths of the latter in Disaster Management. CPSEs need to network with the Ministries in Government of India/NDMA at the National level and State Governments/SDMAs at the State level to strengthen and formalize their role in the DM process for ensuring preparedness of the communities towards disaster resilience.

11.4.2 Project activities identified under CSR are to be implemented by Specialized Agencies and generally NOT by staff of the CPSE concerned. Specialized Agencies could be made to work singly or in tandem with other agencies.

11.4.3 Such specialized agencies would include :--

- i) Community based organizations whether formal or informal ;
- ii) Elected local bodies such as Panchayats;
- iii) Voluntary Agencies (NGOs);
- iv) Institutes/Academic Organizations;

- v) Trusts, Missions, etc.;
- vi) Self-help Groups;
- vii) Government, Semi-Government and autonomous Organizations;
- viii) Standing Conference of Public Enterprises (SCOPE);
- ix) Mahila Mandals/Samitis and the like;
- x) Contracted agencies for civil works;
- xi) Professional Consultancy Organizations, etc.

11.4.4 CPSEs should generate awareness among all levels of their staff about CSR activities and the integration of social processes with business processes. Those involved with the undertaking of CSR activities should be provided with adequate training and re-orientation.

11.4.5 Initiatives of State Governments, District Administration, Local Administration as well as Central Government Departments/Agencies, Self-Help Groups, etc., would be dovetailed/ synergized with the initiatives taken by the CPSEs.

11.4.6 Every care should be taken to ensure that there is no duplication of CSR activities undertaken by the CPSEs with that of programmes run by Central, State and Local Governments.

11.4.7 While assigning CSR project to specialized agencies, every possible effort must be made to verify the reliability and clean track record of such agencies. CPSEs may make efforts to prepare suitable panels of such agencies or they may select from panels maintained by Government, Semi-Government, Autonomous Organization ofr the National CSR Hub. etc.

11.4.8 Activities related to Sustainable Development will form a significant element of the total initiatives of CSR.

11.4.9 Such activities should come under the 3 UN Global Compact Principles pertaining to the Environment. Businesses are asked to :

- i) Support a precautionary approach to environmental challenges:
- ii) Undertake initiatives to promote greater environmental responsibility; and
- iii) Encourage the development and diffusion of environmentally friendly technologies.

11.4.10 Companies may also keep in mind the Environmental Management System as per ISO 14001.

11.4.2. FUNDING

11.4.2.1 The **CSR budget will** be mandatorily created through a Board Resolution ad a **percentage of net profit** in the following manner :--

Type of CPSE Net Profit (Previous Year)	Expenditure range for CSR in a Financial Year (% of profit)
(i) Less than Rs. 100 crore	3% - 5%
(ii) 100 crores to Rs. 500 crore	2% - 3% (Subject to a Minimum of 3 crores)
(iii) 500 crore and above	0.5% - 2%

11.4.2.2 Loss-making companies are not mandated to earmark specific funding for CSR activities.

- 11.4.2.3 They should achieve CSR objectives by integrating business processes with social processes wherever possible and taking up such initiatives which do not involve cash outgo, e.g., by synergising their CSR activities with those of other profit-making cos.
- 11.4.2.4 The CSR Budget should be fixed for each financial year. This funding will not lapse. It will be transferred to a **CSR Fund**, which will accumulate – as in the case of **non-lapsable pool** – for the North East.
- 11.4.2.5 In case CPSEs have different Profit Centers like Factories/ Plant locations, they may be allocated separate CSR budgets to be spent by them under the Annual CSR Budget allocations.

Chapter - 12

Modernization and Information and Communication Technology (ICT)

12.1. Introduction

12.1.1 In Major Ports, productivity in terms of ship turn-round time, waiting time and average ship berthday output has slowly improved over the last decade, but the performance continues to be modest when compared with generally accepted international standard and performance of regional ports. High percentage of non-working time at berth per vessel is one major factor in low performance of Indian Ports. This has discouraged most shipping lines from introducing direct container services, preferring feeder services from the ports of neighboring countries. The potential for increasing output performance and handling capacity through the introduction of improved handling techniques varies by cargo type. In addition to modernisation of existing port facilities, new operational procedures and practices need to be developed coupled with simplified documentation and communication/information systems. All these need to be integrated into the terminal concept in line with the requirement of new technology.

12.1.2 Globalization, rapid adoption of technology and competitiveness have become critical objectives to the exporters and importers in India and to fulfill these objectives, they are placing higher demands on the entire supply chain. Many companies have significantly changed the way they conduct business by **implementing ERP models** and expect others in the supply chain to match their speed and accuracy. All these changes require the various links in the supply chain to provide online information, infrastructure for instant booking of facilities and faster booking confirmations, frequent updates on status and alerts on delays. 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 better serve their customers. These companies recognize that **global visibility** is critical to customers and to the success of their supply chain logistics.

Regardless of this shift, parts of the transactions in the 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, involving obtaining status updates from or transacting business with other members of the community, take place manually resulting in further manual re-entry of

data into their internal systems manually. These activities slow down the flow of information, are error-prone and adversely affect service levels – piling up costs, which are very hard to detect and control. As the dominant players (like Port/shipping industry and Customs) has begun to adopt electronic exchange of data and e-commerce practices, manual steps are gradually being replaced by automated systems and transmitted by EDI messages. But this is occurring very slowly in a piecemeal fashion and hence the real benefits are not being realized for the entire community.

12.2 Modernization of Ports

12.2.1 Increasing productivity with existing resources and creating more productive assets is necessary, systemic weaknesses notwithstanding. Structural and organisational impediments to increased production and productivity have been a common experience of all, especially the developing countries. It was realized that a speedy and effective improvement in the working of ports will need more than just a tinkering with procedures and occasional halfhearted dents in structural rigidities. What was needed was abandoning the old systems and introducing totally new structures in form and content.

12.2.2 The ports urgently need to upgrade their handling technology, modernise their equipment and management and raise adequate resources, both for the creation of additional port facilities and to improve existing ones. This demands a complete new approach. Ports worldwide have used commercialisation, liberalisation, privatisation and modernisation of port administration as strategies to deal with these issues. These strategies are not of the either or type, but need to be pursued in combination.

12.2.3 It is quite feasible to raise the required resources. However, this will need adoption of innovative methods. Autonomous port authorities should operate on commercial lines so they can raise resources from the primary market by way of equity and debt and from FIs. On the basis of the existing tariff levels, it should be possible for the port authorities to service debt obligations and pay a reasonable return to investors on equity.

12.2.4 With the world entering the information age and with the globalisation of the world economy and trade, container transportation, as one of today's most advanced cargo transportation modes is growing rapidly. The world's containerisation throughput is set to reach 731.88 million TEU by 2017, while the "green shoots" of recovery are expected to strengthen this year, according to a new report by Global Industry Analysts (GIA). It is estimated that Asia share of containerized exports increases by 55% to 64% and imports increases by 46% to 53% of world trade. In order to be able to stay abreast with the globalization of the world economy and meet the transportation requirements of India's foreign trade, it is a matter of great urgency to construct two deep water

container hub ports on either coast of Indian Peninsula. Access to the existing major container handling ports is limited by the depth of water of the approach channels restricting calling of large container vessels. Main line container vessels are progressively getting larger and faster. Post-Panamax container vessels have become one of the mainstays of international container transportation. Today's large container vessels draw 14.5 meters draft and move at speeds of 25 knots. To accommodate such vessels, container hub ports must have access channels of sufficient depth i.e. draft of 17 metres, along with advanced and highly efficient terminal facilities and large cranes.

12.2.5 Modernisation of port administration encompasses those actions used to improve the performance of an organisation (assuming the organisation does not undergo any major institutional changes, such as commercialisation, liberalisation, privatisation). This approach assumes that even under governmental rules and regulations, it is still possible to improve organisational performance with certain management processes, such as corporate planning and career development and tools such as computerised management information, systems applications and electronic data interchange. The primary objective for this approach is to enhance management without changing institutional structure.

12.2.6 The strategies indicated above are not of the either/or type, but required to be pursued in combination to have the desired results. There may also be a need for sequencing to have the maximum impact. While bold initiatives may take some time, various steps, particularly in giving functional autonomy to the Port Authorities, delegation of power at the local ports level, corporatisation of the ports, etc. need to be taken on urgent basis.

12.2.7 Modern cargo handling techniques must be introduced to improve port performance in the Major Indian ports, particularly in the dry bulk cargo, conventional and unitized general cargo trades. There must be a greater dependence on the use of mechanical plant and equipment in cargo handling activities, which will speed up operations and make better use of storage space and other resources. These actions should be accompanied by new regulations, tariff amendments and other policies to induce ship owners to deploy modern vessels equipped with appropriate lifting equipment on the major shipping routes serving India. Ship owners should also be encouraged to use advanced cargo handling techniques and make the most efficient use of berths and other facilities through appropriate regulations and effective tariffs.

12.2.8 One of the implications of the need to modernize cargo handling techniques is that there will be an increase in the demand for equipment. The Major Ports must modernize and expand their equipment inventory to ensure that it meets operators' needs, both now and in the future. Policies should be adopted to encourage terminal operating companies to purchase their own equipment, to reduce the financial burden

on the major port enterprises. Greater use of equipment rental and leasing should be considered. Operations staff must have access to the right types of equipment, of the right capacity and in sufficient numbers, to meet cargo handling needs and to achieve their operational performance targets. Appropriate management procedures and well-designed forms should be developed to control and allocate equipment to the various operational areas and to record the performance of individual units. Equipment holding policies will also need to be examined to determine the most effective procedures, particularly in view of the setting up of independent terminal operators, and to ensure managerial accountability and effective cost control. Supervision of equipment operators must be improved and disciplinary procedures revised and strictly enforced.

12.2.9 Tremendous scope exists in the Major Ports to modernize existing conventional berths and to convert some of these to dedicated or multi-purpose terminals. There is also a need to redesign and upgrade the internal road network and circulation systems in some of the Major Ports to allow the free movement of inland transport, to improve the receipt and delivery of cargo, and to speed up the controls and procedures at the port/terminal gates.

12.2.10 The Civil works relating to many of the existing conventional general cargo berths have been neglected in the past and are in urgent need of repair and refurbishment. The berths also need to be provided with modern equipment. Refurbishment provides an opportunity to redesign the berth layout, perhaps removing existing old transit sheds and replacing them with modern structures which are more suitable for the use of mechanical handling equipment. New paved open storage areas are needed to meet the need of a growing amount of containers, heavy loads and project cargoes and resurfacing of most berths is urgently needed to allow the unimpeded movement of equipment.

12.2.11 Existing operating and maintenance procedures and practices, many of which have their origins in decades passed, need to be revised and updated. Modern procedures and practices must be developed, written down in manuals and circulated to all employees and the content used in an extensive training programme for all staff in operations and maintenance. These procedures and practices are to be rigidly enforced by managers and supervisors. Effective pre-planning and work scheduling procedures should be applied, the management of equipment requisition, operation, etc. improved, and the quality of supervision of cargo handling operations strengthened. Improving the performance of first lien supervisory staff is essential to achieving good operational output.

12.2.12 Maintenance of equipment and other key assets is an extremely important aspect of management responsibility. A persistent problem in the Major Indian Ports is the high down-time or low availability of mechanical handling plant, resulting from poor operating and maintenance procedures. The status of maintenance must be raised

within the organisation, suitable workshops provided, a properly trained workforce developed, effective spare parts/materials policies formulated and a plan maintenance scheme introduced. Immediate and determined efforts are needed to remedy current maintenance deficiencies.

12.2.13 Improving performance will best be achieved by formulating appropriate operating and maintenance procedures and policies and developing well-designed forms (possibly computer based) for use in management control systems. Port modernisation committees should be formed and given the necessary authority to modernise existing operating and maintenance practices and procedures. Senior management should give them their full backing and support in implementing these procedures.

12.3. Information Systems at Ports – a model

12.3.1. Ports are vital links in the transport chain between sea and in-land routes. The main functions of the port include conservancy of the port approaches, safe navigation of ships within the port limits, pilotage from the anchorage to the assigned berth and vice versa and during the onward/ outward journey, cargo loading/ unloading operations, storage, etc. Generally, the port also provides labour and equipment for the cargo handling operations.

12.3.2. The port is, therefore, required to interface with the Shipping Agents, the representative of the ship-owners and with the Customs 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 exercise statutory control over movement of import and export of cargo and with banks for funds flow.

12.3.3. Ports deal with a wide range of activities like movement of ships, passengers, cargo/containers through different modes of transport, loading and unloading of ships and interaction/clearance from different statutory bodies and port users. In addition, allocation and management of physical resources like berths, anchorages, channels, tugs, equipment (both port-owned and private), 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.

12.3.4 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 challenges of higher efficiency of port operations. Hence, application of Information Technology is one of the key issues in the modernization of Ports.

12.4. Computerization at Indian Ports

12.4.1. Computerization at Indian Port sector commenced in 1970s but it was limited to processing statistical information, preparation of wage bills, etc. It was in mid Eighties, when other ports initiated actions towards computerization of their activities. Development process has been somewhat limited primarily to non-operational activities, using different types of Hardware/System Software, until quite recently, when most ports introduced internal computerized systems. In the early days, not much thought was given for future developments to enable usage by other sectors of the trading community, or interface with systems of those other parties.

12.4.2. However, Indian Ports are now rapidly moving towards application of state-of-the-art technology / internet to implement integrated Port Operations System and to move towards paperless regime so as to reduce dwell time as also transaction cost to the users. The major areas where such automation is aimed at, include :

- ***Vessel Traffic Management System (VTMS)***
- ***Information Technology in Scientific Application, the Cargo/Container handling operations and non-operation areas***
- ***Surveillance System and Safety & Security System***
- ***Electronic Commerce (EC)/Electronic Data Interchange (EDI)***

12.5. Vessel Traffic Management System (VTMS)

12.5.1. VTMS regulates the arrival and departure of vessels in the navigational channel of the Port. It has a radar for monitoring and controlling the vessel real time position with sophisticated RISC based Alpha Server used for easy control of system.

VTMS comprises one radar station in the Port. The radar video alongwith control / status signals are transmitted to the Harbour Master's control tower by means of optical fibre cable. The radar data processor and radar display are installed at the control room to remotely control the radar of radar site. A microcomputer with standby and interface to the port management computer system maintain the database of vessel movements, vessel related information and aid to the scheduling of arrival of vessels in the Port.

12.5.2 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 has been 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	Presently Traffic is being managed by GPS Radar & AIS, It will be procured shortly
Paradip	Presently Traffic is being managed by GPS Radar & AIS, Tenders has been issued in December 2010
Ennore	Presently Traffic is being managed by GPS Radar & AIS, It will be procured shortly

12.6 Information Technology

12.6.1 Scientific Application:

Kolkata Port has computerized scientific applications covering the hydraulic study of the river regime. Ports of Visakhapatnam, Mumbai and Kandla have upgraded their respective Hydrographic Survey Units. Survey crafts are now equipped with integrated Computer-GPS system for survey and preparation of Bathymetry Charts.

12.6.2 Operational Application:

Indian Major Ports have been implementing/implemented heterogeneous systems 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.

12.6.3 Non-Operational Application:

Other areas, which have been computerized by the Ports, are Pay Roll preparation and related accounting functions such as Provident Fund 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 ERP Solution alongwith 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 alongwith Ports Operation System.

12.7. Surveillance System and Safety & Security System

As a result of fallout of 9/11, a number of new technologies have been introduced to facilitate the implementation of ISPS code in various countries including India. All the Major Ports are ISPS compliant. In the process of implementing ISPS, the need for bio-metric based access management was felt and many ports are in the process of implementation. Besides, the requirement of CCTV based control system has also been felt and some ports are also reaping the benefits of the same.

Presently, all craft tend to have Global Positioning System(GPS), where a satellite station is installed 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 quite strategically 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 .

In the aftermath of 11/26 attacks on Mumbai, the surveillance and security has become top most priority in Ports. Therefore, the need for 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 up to take this challenge. The need for electric fencing with breach alarm is also felt.

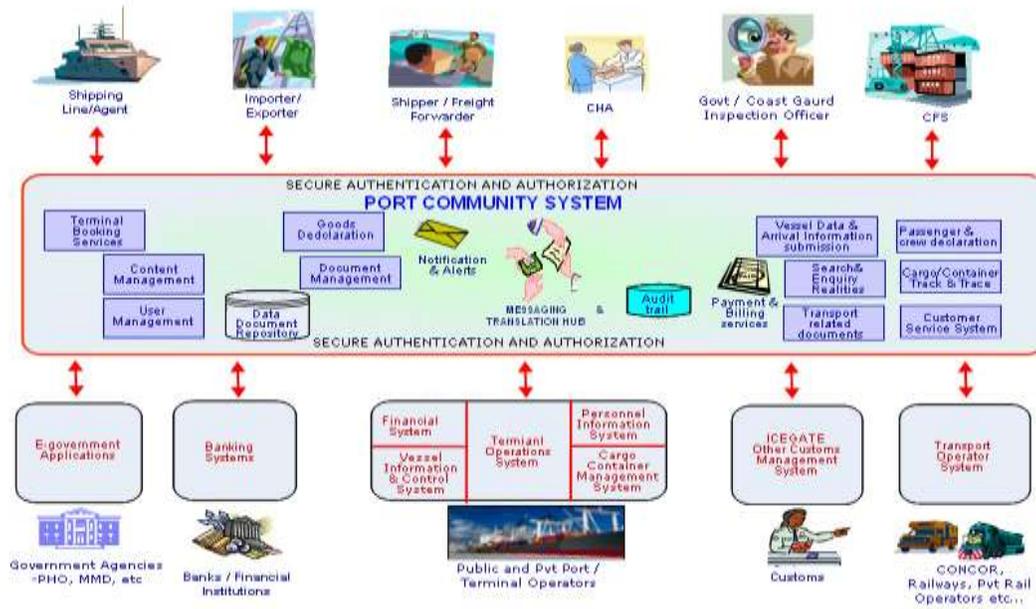
12.8. Electronic Commerce (EC)/Electronic Data Interchange (EDI)

The members of the Port Community depend on the flow of data from other members of the community to perform their functions effectively, since activity in one area are greatly impacted by those on the others. If data can be exchanged between them accurately and speedily, the efficiency and throughput will be improved. Electronic Data Interchange (EDI) has therefore become an essential element for maintaining the efficiency of port operation and also for effective completion of transaction in the trade cycle.

The EC/EDI implementation is vigorously pursued in the functioning of trade regulating and facilitating organizations like Customs, Ports, Airports, Airlines, Shipping lines, Banks, DGFT, AEPC/TEXPROCIL, CONCOR, etc. Implementation of EDI varies from port to port and covers areas like Banks, exchange with Customs and few messages with few users.

12.9 Towards Integration- Port Community System

EDI implementation at Ports was in a piecemeal fashion and hence the real benefits have not been 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 eventually move towards a paperless regime.



Port Community System (PCS) 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 a common interface in a 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. It will improve track and trace efficiency and shipment/service visibility by automatically posting the current status updates by the system of each member as and when any significant event occurs. The status will be available for all interested parties for viewing or downloading as required.

The main objectives are:

- *Develop a centralized web-based application, which will act as a SINGLE WINDOW, for the community members/stakeholders to exchange messages electronically in secure fashion.*
- *Create a DATA RESPOSITORY for research and analysis*

IPA has been entrusted to implement and setting up the Centralized Web Based – Port Community System (PCS) by the Ministry of Shipping. Already Vessel,

Cargo, Container, Transport finance related messages and e-payment module with 14 Banks have been made ONLINE. The Implementation and testing of messages in respect of Port-Customs interface messages are in progress. One message (VESPRO) was made LIVE in December 2010 and eight messages (IGM, BE, Out of charge, Transshipment Permit, Shipping Bill, LEO, Allotment of Rotation Number, Cargo Movement Approval) were made LIVE) were made LIVE from 1st June 2011 in phases and other messages are likely to come LIVE soon

Non-Major Ports namely, Pipavav, Mundra, Dahej have migrated under the ambit of PCS Efforts are being made to have other non-Ports also under the ambit of PCS.

Benefits of PCS:

- ❖ *User will be able to file documents for any port from anywhere in India;*
- ❖ *Convenience 24x7 submission of documents;*

- ❖ *User will be able to monitor and track the activities through the web;*
- ❖ *Provides both web forms as well as message (XML, UN/EDIFACT, TXT format) exchange options;*
- ❖ *Exchange of Standardization of Information;*

- ❖ *Provides gateways for payment, SMS, E-mail, etc. centrally;*
- ❖ *Timely Alert on e-mail, SMS, etc during exceptions;*
- ❖ *Minimize hardware, software procurement and maintenance cost by avoiding duplication of resources at each Port Community;*

- ❖ *Better security, redundancy and providing for Disaster recovery;*
- ❖ *Building of a repository of information for endless query options and a variety of needs including statistics and research;*

- ❖ *Over a period of time when the repository of information gets developed, the past data can be quite valuable.*

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

All the above measures will transform the Indian Ports into a truly top-notch world-class technology driven ports. When India is poised to emerge as the third largest economy in the world, Indian ports also to be geared up to catch up the requirement of world trade and contribute their mite to the economy for which the ports should be equipped with the State-of-Art Technology.

12.10 Bottlenecks

- i. **Lack of element of operational planning, deployment, scheduling or execution** in the Port Operations software on account of the following reasons:
 - the software solutions are built around the existing manual processes and practices. (except for some Container Terminal operations)
 - the domain inputs come from the operational personnel of the port who cannot devote their undivided attention during the study or the development phases
 - the features in the systems developed are limited to what are required as per the existing manual operations.
- ii. In most ports, the integration of different modules of the Port Operations software solutions with the back office functions is not yet available. These modules function in isolation.
- iii. Operation of the system is not critical to Port Operations (except in the case of Container Terminals) since planning and scheduling are not present.
- iv. **Data capture** is done manually in Indian Ports as against ports of the developed countries where data capture is automated with the equipment and devices, e.g. Gate movement of vehicles, containers, vessel movements, truck movements, rail movements etc. The practice of manual data capture is sluggish, error prone and fails to validate the data thus captured. Real-time and accurate information for stakeholders is often not available.
- v. **Sharing of information among various stakeholders** of the Maritime community is not fully enabled in a structured way. Integration of the various applications within each entity followed by exchange of key information with the other players in the logistics chain needs to be focused.

- vi. Non availability of Port specific **Enterprise Resource Planning (ERP)** solution in Indian market.
- vii. Only big stakeholders have automated their operations and integrated the same with internal computerization.
- viii. Resistance to changes in processes and procedures were quite high due to various internal reasons e.g. perceived threat of power loss due to transparency and system controls.
- ix. It is difficult to change the existing Terminal Operational System namely NAVIS, etc due to high cost involve in Change Request Management.
- x. Non readiness of some of the non-major ports in respect of internal automation.

12.11 Recommendations

- Construction/ Development of Deep-Drafted berths, Cargo-specific specialized berths and mechanised berths;
- Installation of modern cargo handling equipment such as conveyors, higher capacity versatile mobile harbour cranes and container equipment
- Replacement of old, outdated low capacity cargo handling equipment with high capacity ultra-modern equipment;
- Development of deep-drafted navigational channels with modern navigational equipment;
- Construction of multi-lane concrete roads and high-axle rail lines;
- Modern Gate-entry and Gate-out logistics systems;
- Installation of Vessel Traffic Management System and Surveillance (CCTV) and Safety Systems;
- Installation of Automatic Identification System (AIS) and Bio-Metric Access Control with boom barriers, turnstyle gates;
- Installation of Scanners (X-Ray, Container, Radio-active material, Baggage);
- Switching over to Remote Train Management, Fibre- Optical Network;
- Procurement of modern communication equipment like INMARSET and Radio Data terminals

- Each port should undertake Comprehensive computerisation covering all activities/ 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 Mormugao and New Mangalore have already implemented ERP Solution along with Port Operation System and other modules that are not part of ERP Solution. Similar ERP Solution is being implemented by all the other Ports.
- Non ERP solution like GIS linking with the Land/Estate Policy, Hospital Management, Bespoke System like Vigilance, Legal, File Tracking, Employee welfare, Right To Information (RTI) Act shall be implemented.
- Ports shall implement Land/Estate Management solution which is completely scalable for implementation of other Business Process like Financial and Management Accounting, etc. As most of the Major Ports have initiative for the Computerization of Land Management process, the need of the hour is the Implementation of a complete application for Real estate Management, Utilities, and Advertisements which is completely scalable for implementation of an integrated ERP application on a Decentralized basis and shall be linked with ministry e-governance initiatives
- The provision for Self Service Scheme available in the system would be introduced as an employee welfare measure.
- Automated equipment (Cargo/Container handling, Weight Bridges) shall also be integrated with the centralized system to avoid manual intervention.
- Campus cabled LAN Network system shall be undertaken covering all the automation system and as a redundancy wireless LAN network shall also be considered.
- GIS technology shall be implemented in Port Operation, Security, Intermodal management, Property and lease Management, Emergency Response & Management, Environment Management.
- 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.

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

- ➡ 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.

- ➡ Each Port shall aim toward the goal to secure the ISO 27001 certification.

Chapter-13

CRUISE SHIPPING, COASTAL SHIPPING AND SHIP REPAIR

13.1 CRUISE SHIPPING

There has been a remarkable growth in recent years in Foreign Tourist Arrival to India due to various efforts made including promoting India through the incredible India campaign in Overseas Market. A Tourist Arrivals in the year 2006 have increased to 4.43 million registering and impressive increase of 14.2% growth. Tourism is an engine for growth of economy. The Indian out bond market will maintain a growth of 15%. India's 7517 kilometers long coastline and strong Port positioning imparts a natural advantage to the country to attract International Cruise Lines. India's positioning in South East Asia and its proximity to already popular cruise destinations would enable strong cruise circuits to be created over a period of time. India's strong domestic tourism sector would enable the Country to achieve a strong domestic cruise sector that could complement the growth and support visibility. The Union Cabinet has approved a Cruise Shipping Policy aiming to increase India share of market since India share is currently 2%. The Cruise Shipping would show case India has a Major Destination of World Tourism. It will generate enormous employment opportunities. With the economy expanding, the middle class possess increasing disposable income, part of which would go into luxury shipping.

13.2 OVERVIEW OF CRUISE SHIPPING INDUSTRY:

- Despite relaxation of sabotage law for cruise ships and offer of concessional vessel related charges and 100% direct foreign investment, factors as customs tax and service on Indian flag ships make it enviable for Indians' to own ships;
- Lack of awareness an expertise of handling cruise passengers by immigration and customs authorities;
- Lack of appropriate Port facilities;

- Cumbersome visa formalities restricting ease of access;
- Improvement of conducive environment for attracting international visitors;
- Lack of adequate promotion focusing on positive aspects of the country.

13.3 CRUISE SHIPPING POLICY

13.3.1 The Government of India approved a cruise shipping policy on June 26, 2008 to boost cruise shipping. The object of the cruise shipping policy is to increase the number of cruise ship calls and passenger arrivals in a sustainable manner by consolidating existing ports of call and exploring other ports and strengthening inter-sector linkages. It was also sought to run up promotional measures that would effectively convert cruise passengers to long stay visitors and to enhance the absorptive capacity of the country by developing existing and new visitor attractions and event attractions.

13.3.2 In analyzing the situation facing Cruise Tourism in India it is seen that the demand for Indian Cruise Tourism is principally from 4 segments:

- ❖ **The *Foreign Tourists*** who represent the International Arrivals into India, offering the greatest potential, representing tourists who are already interested in India as a destination and for whom the cruise would be another mode of seeing the country.
- ❖ **The *Indian Outbound Tourists*** who travel out of India also offer a high potential because of their interest in foreign travel and who could be open to the idea of taking a cruise from India that visits foreign destinations.
- ❖ **The *Indian Domestic Leisure Tourists***, representing active high value domestic leisure travelers who are active travelers inside the country and can be effectively targeted to take a cruise.
- ❖ **The *current Cruise Tourists***, both International and Indian, would be good targets. It is known that cruise tourists are repeat travelers and therefore offer a great potential. Creating new itineraries and destinations in India can attract current cruise tourists, who form part of the existing & future cruise tourism

market. Feedback from tourists needs to be taken into account in designing cruise circuits.

13.3.3 As per the study conducted by the CRISIL (December, 2005) a market survey undertaken has thrown up the following findings:

- ◆ Goa, Cochin and Mumbai are the three ports that are considered best for cruise tourism in India. Goa is the most attractive destination amongst Domestic Tourists & Cochin is the most attractive amongst Foreign Tourists
- ◆ Foreign tourists give utmost importance to the food & cuisine. Indian tourists give importance to the cruise liner itself.
- ◆ Fast immigration & transit through the port is the topmost priority for both foreign and domestic tourists.
- ◆ The most preferred cruise circuits among the tourists are:
 - Mumbai- Cochin – Kerala Backwaters, for Foreign Tourists
 - Cochin - Goa - Lakshadweep – Male, for Domestic Tourists.
- ◆ Foreign tourists consider building international cruise terminals & making India more tourist-friendly to be the most important initiatives to position India as a cruise destination, while Domestic tourists give importance to creating good destinations at the ports of call.
- ◆ Among domestic cruises, Goa Sea & River Cruises are perceived to be the most attractive by the domestic tourists whereas the Kerala Backwaters cruise is most highly rated by the foreign tourists.

13.3.4 RECOMMENDATIONS

- As a general model, rather than investing in new cruise ships, the recommended path for cruise tourism in India is to create the market and the infrastructure necessary to attract the existing cruise ships to India. For this purpose India can position its ports either as 'Ports of Call' or as a 'Home Ports'. Positioned as a 'port of call' the country would receive international ships that touch several destinations as part of their cruise circuit. The

cruise travelers who disembark at the port would have the linkage to visit destinations in the vicinity of the port; there are also cases where cruise travelers take a flight to see the Taj in Agra and rejoin the ship at its next India port of call, which possibility needs to be built upon. Positioned as a 'home port or hub port', the port would be the base for a cruise ship, which would take passengers on a cruise circuit and then come back to the homeport to berth. Today there are around 315 vessels cruising around the world. Taking the routes into consideration, there are around 150 ships which can 'call' at India ports, during the off-season in their typical routes. Examples of such cruises would be vessels plying from

- US West coast to Hong Kong
- Singapore to SE Asia & Gulf/Mediterranean
- South Africa to US East Coast

India's strategy should be to pull these cruise vessels to our shores by creating the necessary attractions, positioning, linkages and affiliations.

- Similarly, India can also try to make the existing cruise operators position one or two of their cruise ships in India, using the Indian Ports as 'home ports'. For example, 'Star Cruises' starting operations in India with Mumbai Port as the Home Port is an example of the latter. Starting operations in September 2005, Star Cruises redeployed 'Super Libra' an 18 year old ship from Norwegian Cruise Lines having 1,500 passenger capacity.
- While acquiring large cruise ships would be unlivable, India could perhaps consider a model of smaller but quality cruises catering to small and niche segments. These could ply along the Indian coast enabling international and domestic tourists to explore Indian destinations along the coast line. The unique model followed by Amet Cruises, which combines the cruise ship for training slots and for cruise passengers, is an experiment that one hopes will sustain and succeed. In this case the operator who started out in training in the merchant shipping, branched out into cruises reserving 200 cabins in the

ship for onboard training of cadets.

- There is also the case of Tuticorin Port Trust that successfully launched a ferry in March 2011 between Tuticorin and Colombo, with the operator hiring the **Scotia Prince** and operating it for both cargo and passengers.

- In the 'supply driven' market of Cruise Tourism (with capacity driving the market) cruise liners are ever in search of new markets, new itineraries and new destinations. If adequate facilities, services and infrastructure are provided, that will in turn attract more and more cruise operators to the shores.

- Even States that do not fall in the main cruise route, such as Gujarat & Karnataka in the West Coast and Orissa and West Bengal in the east coast, could be connected through cruises. An illustrative list that is not exhaustive could be:
 - Calcutta – Andamans
 - Pondicherry – Andamans
 - Goa – Mangalore
 - Cochin – Lakshadweep

- This is only indicative and many such itineraries may be drawn up. The important fact is that this would throw open each of these States to a new set of opportunities in terms of access, linkage, destinations that may be showcased and circuits that may be created.

- Like Europe, India has destinations in its interiors many of them which are connected by beautiful rivers. Developing River Cruises that connect these destinations would not only create the access that is so important for cruise tourism, but would also enable India to strongly position its tourism destinations and its exotic heritage.

- World-class facilities cruise tourists are used to and look forward to, are made available at Indian Ports. Despite the fact that the investment may not yield adequate returns in the near future, unless this is done, it will not be possible to promote and market India as a cruise destination. Huge investments required to develop requisite cruise infrastructure at ports can

be justified on grounds of broader economic benefits to the nation

- With regard to the berths themselves, these berths must be multi-functional whereby in the absence of cruise vessels, ships with clean cargo may also be berthed. However the priority for berthing at these terminals must be given to the cruise vessels. This would help rationalize port charges for cruise vessels at Indian ports. The charges now levied at the ports are at the same rate as for cargo vessels whereby the cruise vessels with their large Gross Registered Tonnage (GRT) are unduly disadvantaged; tariff fixed for cruise ships should factor in this aspect and attempt rates that are comparable to those at other cruise terminals in the world.
- Proper provision must be made for customs, immigration, security setup at the terminal alongside the berth for the convenience of the passengers and crew members, with proper facilities like certified gangways, baggage handling facilities, bunkering facility and proper fendering of berths to handle ships up-to 150,000 GRT.
- Ministry of Tourism has a scheme for Central Financial Assistance to State Government/Union Territories for development of "Product/Infrastructure Development Destinations and Circuits". Assistance is sanctioned under the scheme for promotion of river tourism for procurement of cruise vessels, boats, catamaran, rice boats, houseboats, glass bottom boats, water sports equipment etc. this scheme must be liberally used to speed up development of cruise terminals in the ports of Mumbai, Goa and Cochin in the first instance, and other ports later.
- Cruise terminals should be made into mini-tourism destinations, much like a tourist village, showcasing India's art and handicrafts, ethnic bazaars, a small museum offering a bird's eye view of the tourist attractions of the region, food stalls with typical Indian cuisine, children's play area etc. It should effectively promote the 'India Brand' while simultaneously increasing commercial and business potential of the terminal.
- The cruise terminal should also act as a gateway to the tourism

offering of the region, thus becoming a destination in itself. Thus, for the cruise traveler, in addition to the cruising experience and the infrastructure and facilities at ports during port visits, the destinations covered and the general experience within the country/destinations visited would form a critical part of the overall product expectation. Hence, it would be important to create links to significant destinations, heritage locations and natural features with the port so as to enable a special and varied experience that is holistically 'Indian'. This would also help to link the development of tourism in India to the development of cruise tourism, helping to synergize each with the other.

- The following would be essential to provide the connectivity required to link to tourism offerings to cruise ports:
 - Connectivity through small and feeder aircrafts
 - Connectivity through river cruises and exploiting inland waterways
 - Connectivity through road transport where distances are not prohibitive.
- Furthermore, in adapting cargo berths to cruise terminals, more sensitivity requires to be given to passenger convenience needs in planning exit and entry facilities through dock gates. Security concerns may predominate in approving entry/exit routes for cargo, which even if circuitous, need not rankle since they are inanimate objects; a very different and more sensitive yardstick needs to apply in the case of cruise passengers and the nearest dock gates must invariably allowed for the purpose.
- Measures are to be taken for Private participation. Like the new civil aviation policy, the cruise tourism policy should stress the need to 'change the traditional concept of terminal development, ownership and operations' and underline active 'participation' of all private stakeholders. Major Ports where cruise terminals can be developed most easily by modification of existing facilities, should be allowed to outsource management of the whole terminal as skill sets required for

managing cruise shipping are quite different from cargo handling which is what these Ports are used to. Since the development of the cruise terminals in each region would be closely linked to tourism development and circuits in the region, it would be possible to develop a viable model wherein development of the cruise terminals could happen through participation of the stakeholders. Possible private developers who would be ready to get involved in developing cruise terminals may be any one or a combination of Cruise Lines/ Cruise Operators, Foreign Cruise Terminal Operators, Port Operators, Hoteliers/ Hospitality Players, Large entrepreneurs in Tourism/ other business, Private Airlines, etc.

- There are, however, fiscal deterrents that have de-motivated the cruise liners from operating in India. The basic issue is regarding applicability of Indian Service Tax laws on this fledgling industry. In every country, the international tax jurisdiction for any maritime business is 12 nautical miles. Beyond this, are international waters and income earned or accrued outside of those 12 nautical miles is tax free. The enhancement of India's EEZ from 12 nautical miles to 200 nautical miles acts as a deterrent for cruise liners to the extent that Service Tax is levied on a coastal circuit on services rendered on the cruise, like massage/beauty parlors, sauna bath etc; the position needs to be made comparable to that in other countries.
- Customs duty on bunkering for coastal shipping, including cruise ships, is presently around 33%. Additionally, while some States have waived, or have lower rates of VAT/Sales Tax on sales of bunker to foreign going vessels, States normally charge VAT/Sales Tax on sales of bunker to coastal vessels. Sales tax/VAT-free and duty-free bunkering of cruise ships, Indian or foreign, doing coastal runs will give a fillip to coastal cruise tourism.
- Quick immigration clearances for passengers is extremely important to cruise tourism, but the liberalization of procedures which has been

slowed down now by concerns over national security and terrorism, has to be revived and procedures made more tourist-friendly.

- Duty free shops on board a foreign cruise vessel are required to be sealed when they convert to coastal leg; such an act is an irritant for passengers on board; the position regarding this may have to be re-assessed.

13.4 COASTAL SHIPPING :

13.4.1 Coastal vessel is a vessel of Indian Registry with exclusive Indian crew, engaged in the carriage by sea of passengers or goods from any Port are placed in India to any other Port are placed in India and/or any vessel having specified period license for coastal trade issued by the Director General of Shipping. The growth of coastal tonnage has been lop sided in terms of its composition with tugs and off shore vessels accounting for more than half the number of vessels and dry cargo carriers accounting for over half the tonnage. As on 30th June, 2010, 682 coastal trade vessels with a GT of 1002840 and DWT of 1004712 are available for coastal trade.

The following table provides composition of coastal fleet:

Composition of coastal fleet as on 30th June 2010			
Type of vessel	No. of vessels	GT	DWT
Dry cargo liner	71	121843	177836
Tug	228	68361	23140
Dry cargo bulk carrier	12	237220	364928
Tankers (Product carriers)	13	40035	43226
Tankers (crude oil carrier)	02	50080	82246
Passenger cum cargo	31	86173	27232
Passenger services	52	16473	1930
Ethylene Gas carrier	03	8727	6558
Roro	01	956	1386
Dredgers	28	121893	76152
Offshore supply vessels	110	117679	133896
Type of vessel	No. of vessels	GT	DWT
Specialized vessels for	38	88201	50480

offshore services			
Port Trusts and Maritime Boards	93	45199	15702
Total vessels coastal trade	682	1002840	1004712

As on 31.01.2011, GT stood at 1013682. This is around 10% of the total tonnage of Indian fleet.

13.4.2 The total cargo traffic handled at Indian Ports over the 10 year period from 2001 to 2010 has more than doubled. India's coastal and e-xim cargo traffic is estimated to be 152.5 million tonnes and 692.4 million tonnes respectively in the year 2009-10. However, since loading and unloading figures included, the originating coastal cargo traffic shall be 76.25 million tonnes only. The coastal cargo has grown only by 3.3% CAGR whereas the overseas cargo has registered 12% CAGR during the period 2001 – 2010. It is noted that the share of non- major Port traffic in overall cargo traffic has grown to more than 33% in 2009-10 from 23% in 2000-01 due to development of many non -major Ports by Maritime States by PPP model. Among the commodities, the share of bulk cargo (liquid, dry and break) commodities such as POL, Coal, Iron and Cement has come down from 94% in 2005-06 to 87% in 2009-10. On the other hand, the share of “Others” has seen an increase from 6% to 13%. A noteworthy feature of coastal trade is that the passage of traffic is not equal in both directions, leading to imbalanced coastal traffic movement. This makes it necessary for coastal ships to sometimes sail in ballast on return journeys.

13.4.3 OVERVIEW OF COASTAL SHIPPING

13.4.3.1 There are several distinct advantages of routing cargo by sea like, reduction of road conjunction, reduction of loss of life and material due to road accidents since annual losses of more than Rs. 300 billion are incurred due to road accidents resulting in more than 0.1 million lives lost annually, reduction of GHG emission, environment friendly and fuel efficient alternative to road and rail transport. Lower fuel consumption, reduced cost of carriage at Rs. 0.25 per tonne KM compared to Rs. 1.20 by road and by Rs. 0.660 by rail, saving of time

in certain specific routes etc. The Government had already put in place a tariff policy by which Coastal ships are levied concessional port tariff. Despite of these distinctive advantages, the Coastal Shipping in India has not been able to get momentum and the share of the cargo handled through coastal movement is almost stagnant at around 19%-20% level over last 10 years. The reasons for slow growth despite its inherent advantages have been due to a variety of institutional, physical, operational and financial issues, like:

- Inadequate infrastructure in many non- major ports like siltation, draft availability and operational constraints.
- Non availability of traffic in both directions forcing the vessels to sail in ballast.
- Conflict of interest owners to deploy vessels in profitable international shipping routes than deploying in coastal trade.
- Peninsular shape of the country making East - West distance shorter by land route than by sea route.
- Compatibility advantage of Railways and Roads over coastal routes since Railway freight rates are economical and road transport provides door to door service.
- Origin and destination of cargo not necessarily located along the coast and has to move into an hinterland resulting in multiple loading and unloading of cargo incurring additional transport cost.
- Poor coastal tonnage in shipping capacity.
- Cyclonic effects on East Coast Ports and closure of some Ports during South West monsoon time.
- Strict customs control of coastal shipping and documentation procedures.
- Lack of dedicated berthing facility and berth reservation for coastal vessels.

13.4.4 RECOMMENDATIONS

- Winning over Road and rail Traffic by enhancing Government Plan provisions and expenditure on shipping to compete on equal terms with road and rail sector.
- Integration of coastal shipping with other transport system considering it as a part of logistics chain so that procedures and linkages necessary for seamless connectivity in the multi modal chain emerge as critical for development of coastal shipping.
- Since shipping and vessels are not considered as infrastructure they are not getting tax holiday for the first 10 years on commencement of operations like that of roads, airports, railways, conferment of infrastructure status under section 80(i)(a) of the Income Tax Act shall attract investments.
- Central Board of Excise & Customs Notification No. 16/98-Cus dated 11/3/98, states that vessels carrying exclusively coastal goods will not be required to file IGM/ EGM. However, in practice they are still required to file the IGM/EGM documents, and sometimes even Bill of Lading / Bill of Entry in place of Coastal Bill of Lading / Coastal Bill of Entry. Thus, while the relevant notifications have done away with the requirements for cumbersome documentation, the same is not done in practice. While a coastal vessel is exempted from paying customs duty, it has been reported that in most cases, a lump-sum payment per shipload has to be paid to the officials by Shipping companies for the shipment to be loaded / cleared. This additional payment made to the Customs inflates the cost of coastal movement. The coastal shipping being inland transportation should be free from customs requirements.
- Under the Available Mechanism, it is the user industry that gets the carbon credit and not the coastal transporter. A generic mechanism for Indian coastal trade will need to be developed and put in place. .

- Fuel costs are currently 40% of total voyage costs of coastal vessels. They have to pay duties on bunker sale totaling around 33% whereas sales of bunkers to foreign going vessels are treated as exports, hence conferment of the status of declare goods to bunkers would reduce a sales Tax/VAT on such goods to 4%.
- Although the Union Budget 2011 has provided an exemption of 25% from the taxable value for service tax on transport of coastal goods and goods transported through national waterways or inland waterways, time charter services are still covered under the service category of supply of tangible goods and services and are taxable. It is recommended that all modes of transportation should be given the same level of abatement and that time charter services should be exempted from service tax. Since transport of goods by road is eligible for 75% abatement and rail transport services are eligible for 70% abatement for the levy of service tax.
- Government can consider exemption to coastal shipping crew from the ambit of income tax for at least five years since experienced crew who work on foreign vessels or Indian vessels with ply outside Indian territorial water for more than 183 days in a year are entitled to non residence status and pay no tax, whereas the Officers who man the coastal vessels are subject to tax and hence increased their salary expectation to off set the loss of income due to tax.
- CABOTAGE POLICY : Absence of full cabotage is seen as an impediment to investment in coastal shipping by the Indian National Ship Owners Association. Cabotage policy has an important wherein on the coastal trade of country. The committee therefore recommends that the Government should immediately undertake a review of the cabotage law and take appropriate decision in consultation with the all stakeholders involved.

13.5 DEVELOPMENT OF SHIP REPAIR AND MAINTENANCE

13.5.1 Ships need continuous maintenance and repair for smooth running. They are obligated to meet the classification and statutory requirements necessitating routine inspection at ship repair yards. The Classification Society Regulations make docking survey to be performed twice in a period of five years and the gap between consequent surveys should not exceed three years. The norms of the classification society for ship repair schedule are given below:

Hull and machinery survey	-	1 year
Dry docking survey	-	2-3 years
Boiler survey	-	2-3 years
Hull and machinery special survey	-	4-5 years
Tail shaft survey	-	4-5 years

Thus, the ship repair industry has steady income stream due to the classification and regulatory requirements.

13.5.2 OVERVIEW ON SHIP REPAIR AND MAINTENANCE FACILITY

13.5.2.1 India has 26 ship repairing units registered under the Directorate General of Shipping out of which seven have been given permanent approval. They are located in six clusters – Gujarat, Mumbai, Goa, Cochin, Chennai – Vizag, Kolkata. Ship Repair Yards seems to be unevenly distributed with respect to the traffic handled in the respective cluster. Most of the ship repair units do not have their own yard and they are on the Port premises/adjoining areas of Major Ports. There are dry docks available within Port Trusts which can also be used for limited repairs of ships.

13.5.3 RECOMMENDATIONS

- Promotion of more ship repair yards in the existing marine clusters.
- Since 818 (99.6% of existing world fleet) capsized vessels, 233 VLCC Tankers and 273 post Panamax Container Ships are on order book, Promotion of huge facilities capable of handling bigger vessels is the need of the hour.

- Policy of earmarking at least one berth apart for wet repairs with all facilities by the Major Ports doing trade of more than a specified tonnage.
- Granting of deemed export status due to saving of foreign exchange.
- Simplifying clearances for import of spares and equipment.
- Developing more ship repairs yards to the proximity to the International routes especially on the west coast may help to tap the potential for the same. The northern portion of the coast line of Maharashtra and Gujarat which are currently frequented by a large number of ships may be well suited.

CHAPTER - 14

PORT SECURITY FRAMEWORK – ISSUES AND POLICY

14.1 The Major Ports in the country are being increasingly viewed by security experts as potential targets for terrorist attacks. Ports are vulnerable because they allow a unique freedom of continuous flow of vessels, cargo and people to transit through them with relative anonymity. Ports allow access to thousands of trucks every day, making it possible for terrorists to make use of such trucks to gain access or smuggle arms or explosives into or out of a port. Some ports permit public water transport / fishing and recreational boats that terrorists could make use of.

14.2 India imports approximately 70% of its oil requirements, and the country's economy is highly vulnerable to crude oil supply disruptions. Most of the crude oil is imported through the 12 Major Ports, besides SPMs installed by oil PSUs and private sector refineries. This concentration of all energy products at particular ports highlights the vulnerability of the country to any determined attacks to our oil infrastructure as well as energy security.

14.3 Based on past experiences and incidents reported from different parts of the world, the possible threats include (a) Use of cargo containers to smuggle terrorists, arms, ammunition, explosives, or other dangerous materials into or out of the country; much concern has focused on the threat that containers could be used to smuggle radioactive materials or dirty bombs, (b) Seizing control of commercial cargo ships for use as a collision weapon, (c) Use of a boat or barge loaded with explosives to ram against a large ship, (d) Attacking a large ship carrying a volatile fuel (such as LNG / LPG / crude oil and detonating the ship so as to cause a massive in-port explosion, (e) Attack of an oil tanker in a port or at an offshore discharge facility (like the SPM) so as to disrupt the country's energy security or cause large-scale environmental damage, (f) Hijack or attack of a passenger ship to take hostages, (g) Sinking a vessel in a Port entrance channel blocking traffic, (Ports like Cochin and Visakhapatnam, where the same channel is also shared by the Navy, such a possibility could have serious militaristic / strategic implications).

14.4 Although no major terrorist attacks have occurred in India's ports so far, time and again terrorists have demonstrated their propensity to attack centres of economic activity and their ability to access and destroy infrastructure, assets and lives. Moreover, containers have been used for smuggling arms / ammunition and other contraband, through some of the Major Indian Ports.

14.5 AGENCIES INVOLVED IN PORT SECURITY & SECURITY STANDARDS

14.5.1 Security at the port is looked after by the Port Facility Security Officer (PFSO), who coordinates all Security functions through Central Industrial Security Force (CISF) in all Major Ports except Mumbai (where security functions are performed jointly by the Port Security and Mumbai Police). In addition, the other agencies involved in maintain various aspects of the security are: State Police (Law & order, crime prevention, investigation into crime etc.), the Coast Guard, the Navy, the Customs Department (though not specifically saddled with security functions, plays a key security role) and also Private security agencies employed by Terminal Operators. Various other central and state security organizations including immigration and intelligence agencies are involved in formulating vulnerability assessments and making recommendations.

14.5.2 The responsibilities shared by various agencies as mentioned above often crosses jurisdictional boundaries and in effect leading to some ambiguity in their respective roles. While some of these multiple jurisdictions cannot be avoided, there is need for a clear articulation and demarcation of duties and responsibilities. This ambiguity is very pronounced in matters relating to exercising surveillance over vessels near coastal waters, especially in the waters around the outer anchorage areas of Ports. With a number of Ports developing Single Point Mooring (SPM) facilities for handling crude oil and petroleum products, which are located 10-20 nautical miles into the sea, the responsibility for security of these installations needs to be clearly assigned to a single agency, preferably the Coast Guard. Considering the extent and complexities of our coastline, it is felt that the existing institutional frame work for protection of our vast maritime borders is inadequate.

5.10.3 There is a urgent need to lay down security standards for Ports. All the Major Ports have implemented the International Ship & Port Facility Security (ISPS) Plan, spearheaded by the International Maritime Organization (IMO) with a view to enhancing security of international maritime trade. There is good awareness of the security requirements in all Ports and Shipyards and physical security arrangements in most Ports were generally good. Gaps or deficiencies wherever noticed, were pointed out to authorities concerned, who have been advised to take corrective action. All Major Ports have also put in place the requisite physical and management infrastructure to maintain effective oversight of implementation of their respective security plans. However, it has been noticed that there is wide variation in the systems, processes and protocols followed by Major Ports and Shipyards. There is also a risk that private terminal operators might resort to cost cutting on security related matters, which could be dangerous. In view of its implications on national security, the Committee recommends that security of Ports and Terminals should not be left to the sole discretion of individual Ports or Terminals and that Government of India should prescribe mandatory standards for port security.

14.5.3 Until recently, Port operations were the exclusive domain of the Major Port Trusts or State Governments. Security of the Ports traditionally, remained fully within the hands of the Central or State Government Agencies. However, lately a number of private operators, both domestic and international, have been allowed to build and operate Ports and Terminals in the country. Given the global nature of the shipping business, this trend is bound to continue in the future. Some of these operators the Dubai Ports World (DPW), Port of Singapore Authority (PSA) etc. are owned by foreign Governments. DP World which operates some important port terminals in the country, operates as a commercial entity, but is owned by the Government of Dubai (United Arab Emirates). After the acquisition of P&O by DP World, the latter has become the largest container terminal operator in the world, with 42 terminals across 22 countries. In India, DPW operates terminals in Cochin, JNPT, Chennai, Visakhapatnam and Mundra. This new reality raises several serious issues relating to security:

- Should the entire responsibility for security of these terminals be left to the private operators?

- Is the ownership of a terminal operating company relevant to the security of the country?
- Does foreign takeover of terminal operating leases potentially pose a threat to national security?

14.6 RECOMMENDATIONS

14.6.1 The initiatives taken recently by the Ministry of Shipping to provide an effective security cover to the country's Major Ports and Shipyards and the specific security initiatives of individual ports, especially those in strengthening of the security apparatus. Security has been accorded very high priority by the Ministry of Shipping as well as by all the Ports and Shipyards. Although, this has helped in streamlining security of Ports and Shipyards to a certain extent, significant gaps still exist. While the Committee recommends strong measures for enhancing the security capabilities of our Ports and Shipyards, it would also commend a pragmatic approach to ensure that the speed and efficiency of Port operations or movement of cargo along the supply chain are not unduly constrained. We believe that the requirements of security as well as efficiency and speed of port operations could be complementary and not conflicting. The Working Group has made a series of recommendations at policy & Port levels, which are given below.

14.7 RECOMMENDATION AT THE POLICY LEVEL :

14.7.1 **Prescribe security standards:** In view of its implications on national security, the security of Ports and Terminals should not be left to the sole discretion of individual Ports of Terminals. Government of India may prescribe mandatory minimum standards for port security. It should be made compulsory on the part of all ports in the country, both Major and Non-Major, to follow these minimum standards.

14.7.2 **Compulsory deployment of CISF** is recommended at all Major Ports and Shipyards – The practice of employing multiple agencies in charge of physical security and access control duties should be done away with.

14.7.3 Overall security responsibility of Private Terminals should be assigned to CISF : It is the Committee's recommendations that the security of all Ports including private container port terminals, should be assigned to the Central Industrial Security Force. Individual private operators may have their own private security arrangements for control and regulations within their facility. The private terminal operator should meet the expenditure on CISF fully or proportionately, depending on whether the deployments are being made exclusively for the private terminal or a group of terminals within a Port.

14.7.4 A Separate wing of the CISF may be set up for Port security, on the lines of the Airport security wing. CISG personnel posted to this wing may be imparted specialized training to suit the special requirements of the sector.

14.7.5 CISF Units deployed at Ports should have Bomb detection and disposal Units and Dog Squads. Basic bomb detection equipment like explosive vapor detectors as well as Bomb suppression blankets should be available at the disposal of CISF at each Port. In those cities where CISF has been deployed in multiple facilities situated in close proximity, the possibility of sharing such resources with other units may be explored, to save on costs.

14.7..6 The security-related responsibilities of Private Terminal operators complying with a set of minimum standard to be prescribed by Government, should be made part of the tender condition while selecting the private operator, so that he remains contractually bound to comply with these conditions. The private terminal operators should be required to (I) draw up a terminal security plan and submit it to the concerned Port Trust or Government authority (like the State Maritime Board) for review and approval)ii) provide minimum prescribed physical security infrastructure and (iii) follow certain prescribed security practices in handling cargo. Each terminal operator should be required to conduct a security assessment of his facility in consultation and co-operation with the PFSO of the Port concerned and the CISF.

14.7.7 **Standards for private security agencies** : Standards should be prescribed for the recruitment, training, security vetting and management of all private security personnel and agencies, deployed on security of private ports / terminals. Private security guards deployed by the port operators should conform to such prescribed standards of training and skill developments, and should also comply with the requirement of verification of their character and antecedents.

14.7.8 **Install non-intrusive container inspection systems and radiation detectors at Ports** : Each Major Port / Terminal handling containers should acquire at least one X-Ray based cargo inspection system, to begin with, for non-intrusive inspection of containers. It is also recommended that Radiation Detection Portal Monitors that screen containers for radiation from possible nuclear weapons or dirty bombs, may be installed at the entry gates of Ports through which containers pass.

14.7.9 **Investment of security** : The present practice of passing on all the investments on security to the trade needs to be critically examined. As increased costs of security are likely to hurt competitiveness as well as efficiency of trade, there may be a tendency to cut costs on security, which could be risky. Government of India may consider meeting part of the additional expenses for the security personnel and equipment. Government may also consider fully funding technology and equipment for scanning of containers.

14.7.10 **Ports should make investments in leveraging technology** for modernizing access control, physical security and surveillance as well as in supply chain security and tracking of vehicles and containers.

14.7.11 **Technical Standards** should be laid down by the Government to enable port security to track private containers and their contents.

14.7.12 **Coastal States should devote urgent attention to the development of the Marine Police Wing** of the State Police. This should be done in a time bound manner. The Marine Security / Police wing should also acquire appropriate equipment, technology and trained human resources. The State marine police wing

should also improve operational efficiency by upgrading surveillance and communication facilities to effectively monitor their maritime environment.

14.7.13 Security of terminals handling petroleum products : The concentration of all energy products including crude import/storage facilities in and around the Major Ports, highlights the vulnerability of the country to any determined attacks on our oil-handling infrastructure as well as energy security. Responsibility for securing the Single Point Mooring (SPM) facilities should be clearly assigned to Coast Guard.

14.7.14 Role of Coast Guard : The duties and responsibilities of the Coast Guard listed out in the Indian Coast Guard Act, 1978 (Sec 14.1) needs to be more clearly defined and the organization needs to be provided with adequate manpower, equipment and flotilla to discharge the responsibilities effectively. The role and responsibilities of the State Police Marine Wing vis-a vis those of Coast Guard may be clearly defined.

14.7.15 Fisheries harbours functioning within operational waters of the Ports are potential security risks. Hence Government may consider re-locating them. Till such time, fishermen as well as their vessels using the port waters should be issued with identity cards based on the recommendation of the Fisheries' Department of the concerned State Government.

14.7.16 An Institutional mechanism for regulation and oversight of Port security, on the lines of the Bureau of Civil Aviation Security (BCAS), is recommended. This agency should be responsible for :

- Laying down Port and maritime security standards for Ports, Private Port Terminals, and various other stake holders in the sector.
- Interfacing between the intelligence agencies of the Central and State Governments as well as timely sharing of intelligence.
- Threat and Risk analysis.

- Ensuring that standards as well as rules and procedures of maritime security are strictly followed by the CISF and other security agencies deployed on Port security.
- Laying down training standards for port security personnel.

14.8 RECOMMENDATIONS AT THE PORT LEVEL :

14.8.1 Set up a Communication Control Centre (CCC) : Every Major Port and Shipyard should set up a Communication and Control centre, integrating all security and marine operational functions including the cargo and security gate complex. The CCC should serve primarily as the port's security nerve centre, from where security personnel should monitor and operate all communications and surveillance systems as well as emergency response systems throughout the port. From the CCC facility, security personnel should be able to monitor all vessel movements in the operational areas as well as vehicular movements on the land side, especially truck operations, with closed circuit TV cameras, and will be in close communication with the field personnel at Gate Complex(es) through wireless and intercom phone systems. The CCC should also keep close contact with the Signal Station and operations control as well as with the security personnel on water front patrolling.

14.8.2 Implement automated and tamper proof identification cards based on biometric readers for port personnel and port users accessing the high security areas of the ports. Port identification cards should be designed to include security features such as a tamper-proof hologram, an expiry date, and access locations/zones.

14.8.3 Compulsory verification of antecedents in respect of all employees and those port users who are issued with entry passes for access into the Port's sensitive areas, to assess whether any of them pose a security risk.

14.8.4 Issue of identification cards/passes : Some ports were seen to have outsourced the function of issuing visitors' passes and identity cards. Here, unless a high level of control and supervision is ensured, the possibility of misuse or

compromise of security cannot be ruled out. The Working Group recommends that issue of security passes should not be outsourced and in all cases should be handled by the CISF, based on the recommendations of the Port management.

14.8.5 Enhance inter-agency co-operation, co-ordination and information sharing, though initiatives at the Port level.

14.8.6 Disaster Management Plan of Ports and Shipyards should define the Facility-specific actions and capabilities that First Responders of the Facility should possess to prevent, to protect, to respond to and recover from the disaster incident and the most critically tasks associated with these capabilities. The plan should describe a set of measured, targeted responses to minimize disruption to the continuity or operations.

14.8.7 During emergencies, there should be a single point of contact, and this should be the Communication Control Centre (CCC) of the Port. Senior Managers should be available at the CCC. There must be seamless communication between all important limbs of the Port like the CISF, Fire Station, Signal Station, Operations Control, Local Police, Port Hospital etc.

14.8.8 Quick Response Teams (QRT) should be strengthened and equipped with all requisite equipment and vehicles / boats and available round the clock at the disposal of the Communication Control Centre.

14.8.9 Shift delivery points for petroleum / chemical products out of the bonded areas : In Ports where delivery of petroleum / chemical products are made through tanker lorries, it is recommended that such delivery points may be shifted outside the custom bonded area of the Port. This would not only enhance safety, but would also help reduce the volume of lorry traffic inside the Port.

14.8.10 Security of Passenger vessels bound for Lakshadweep / Andamans require special attention. Ports handling these vessels may enforce a system requiring passengers to carry an identification card / document.

14.8.11 **Port land Encroachment** : Those Ports whose land areas have been illegally encroached, should take action for getting such encroachments cleared. A survey of persons staying in such tenements should also be got carried out with the help of local police.

14.8.12 Some Ports have places of worship located within the operational areas to which entry of outsiders is being permitted. It is recommended that these places of worship should either be re-located outside the Port premises or the present practice of allowing access to outsiders stopped forthwith.

14.9 CHANNEL OF COMMUNICATION & NAVIGATION

14.9.1 The vital role of maritime traffic in world trade has highlighted increased risks and threats. There are approximately 28000 vessels plying each port each year causing congestion in the in the navigational channel of the ports. Along with these vessels there are numerous barges, fishing boats and private commercial crafts plying in the port. Over crowding of these vessels and crafts in the channel increase the chances of accidents due to congestion which may result into oil spillage damaging the environment. Collisions in congested areas, illegal immigration as well as the emergence of terrorist attacks could result in serious human and ecological disasters with severe economical consequences on the country's economy. To manage this vessel traffic efficiently and smoothly Vessel Traffic Management System (VTMS) and Automated Identification System (AIS) prove to be efficient tools. VTMS provides safe navigational services to vessels at the port and can be enhanced to form a Command Centre for Crisis Management Operations such as SAR, oil spill detection and anti-terrorist activities and also the commercial operations such as smooth movements of the ships in the channels and berthing activities. Automated Identification System is an automated tracking system used on ships and VTMS and also works to reduce the navigational risks. In fact there are a number of techniques available for vessel tracking , safety in navigation services , information distribution etc.

14.10 Broad Recommendations

- Each port should have VTS and AIS.
- The matter regarding separate frequency Channel for the fishermen to be taken up with the Wireless Planning & Coordination Wing, Ministry of Communication Govt. of India as their communications are causing interferences with other channels of communication between Port signal and Vessels.
- Separate shipping lane/ channel for vessels, port crafts, other commercial crafts.
- Separation scheme for the vessels carrying hazardous/ dangerous cargoes to enforce compliance of safe navigation regulations
- Integration of Control stations of various agencies like Port's signal station, CISF, VTMS Control, Disaster Management , Marine Police, Coast guard, navy etc.
- Each craft having a GPS System.
- Local crafts visiting port or plying in the port waters or crafts registered under Harbour Craft License Rules to be painted with different luminous/fluorescent colour conspicuously displaying the number by which differentiation of the crafts, their purpose can be identified.
- Tidal Gauging: For the safety and security of the assets, life of the port workers and the nearby port inhabitations, the port should take into account the natural calamities like earthquakes and tsunamis. Specifically the ports which are situated in zone V needs to be more alert.

- It is suggested to have a tide gauging system for measuring the sea levels in consultation with the institutes such as NIOT Chennai, NIO Goa or NEERI, Nagpur which will also help detecting tsunamis. Tide Gauges provides accurate tidal information which is critical for Port & Harbour Operations, Dredging, Surveying, instrumentation deployments, and many other applications.
- **Areas of Broad co-operation between Indian Ports and Ports of other countries** : There is a need for action regarding initiating studies, strategies and actions to reduce greenhouse gas emissions, to provide a platform for the maritime port sector for the exchange of information, and to make available information on the effects of climate change on the maritime port environment and measures for its mitigation. In regard to ports' preparedness towards comprehensive safety and security regime, it is necessary to find out the best practices being adopted by international ports in developed countries.

CHAPTER - 15

ENVIRONMENT ISSUES

15.1 INTRODUCTION

15.1.1 Port being an interface between sea and hinterland, marine pollution by the shipping activities gets extended at the ports too. About 28000 vessels of various sizes and types call Indian Ports annually and over 300000 fishing vessels of various sizes and types are engaged in fishing operations in coastal waters of India that are highly congested and dangerous to safe navigation and a cause for the pollution. Safe and green governance over the maritime domain which accommodate plethora of maritime activities is a challenge. Evaluating pollution impacts on ports, approach channels and in around ports requires consideration of numerous sources of pollution such as marine vessels, trucks, locomotives, and off-road equipment used for moving cargo, dredging activities, port expansion, handling of hazardous cargo etc.

15.2 CONCEPT OF GREEN PORTS

15.2.1 Economic, social and political development through the development of the ports can be achieved only through the cleaner and greener environment and healthful society. It is therefore imperative to operate ports in good harmony with environment; water, land and air. Green Ports Concept thus intends to bring the clean environment in and around the ports by knowing the causes leading to pollution, finding solutions, monitoring and control by initiation and regulatory enforcement. Environment is no more a negotiable topic. Port should self commit to environmental issues.

15.2.2 **Air emission** : Air emission at the ports which is caused mainly due to use of 'bunker oil' by the ships, use of dirty diesel by the thousands of trucks, cargo handling equipments (cranes, tractors, forklifts, pay loaders etc.), harbour crafts used by the ports in the shipping activities, dredgers, bunkering activities and oil installations is the serious concern on the health of the nearby residents of the ports.

15.2.3 There are two groups of air pollutants. 1) Criteria Air Contaminants (CAC) are major pollutants related to port activities having impact on the human health and vegetation and include Sulphur Oxides (SO_x), Nitrogen Oxides (NO_x), Particulate Matter (PM), Volatile Organic Compounds (VOC), Carbon Monoxide (CO) etc. and 2) Green house gases (GHG) having impact on the global warming which mainly contains Carbon Dioxide (CO₂), the major sources of which are fossil fuels burning.

15.2.4 Traffic congestion at the port in the absence of the adequate infrastructure facilities such as gate management, sufficient entry and exit points, and exclusive lanes for the specific movement of the cargo, etc., may lead the idling of the vehicles at the port which is also the cause of prominent air emission. To reduce the Nox, Sox and CO₂ emission, IMO has defined the limit of sulphur content in fuel for ships which is 4.5% m/m prior to 1 January 2012, 3.5% m/m on and after 1 January 2012 and 0.5% m/m on and after 1 January 2020. However, relying on the ships for following the Convention and using the low sulphur content fuel and monitoring the same with the intervention of State Control Officer is highly difficult and hence measures at the levels of Ports are deemed necessary.

15.2.5 Discharge by the ships and pipelines : Under International Conventions for the Prevention of pollution from ships, ships are prohibited to waste discharge at sea which includes oil, noxious liquid substance in bulk, harmful substances in packaged form, sewage and garbage. This waste of the ships visiting port must be discharged in a port reception facility. The most common waste product is dirty ballast and residues from the tanks, sludge from the fuel oil, bilge water and household refuse i.e. garbage. In the absence of the adequate reception facilities, the ships are tempted to illegally discharge these substances into sea or in the port area resulting into oil and water pollution. Sludge adversely impact the port infrastructure and may also become part of the silt material during dredging. If the dredging material is used in the construction activities, reclamation etc., there will be adverse impact on the environment. The discharge of the ballast water may cause unwanted effect on the micro-biological ecosystem in the port. The discharge of the sanitary waste should also be prohibited in ports in order to avoid a nuisance to the

surrounding area. The sanitary waste of the city and the ships should be treated in the same way.

15.3 BRAOD RECOMMENDATIONS AT POLICY LEVEL

15.3.1 Slow Steaming Programme: A speed reduction speed programme by the vessels can get implemented as an innovative idea at all the ports. Speed of the vessel has a direct relation with the power consumption. Engine power is related to ship speed by a third function. If the vessel of the speed is reduced by 10%, the reduction in the power is to the extent of 27%. Hence a scheme can be formulated based on the reduction in the speed. if a vessel travels with a speed of 12 knots and below within 20 nm and attain compliance with the voluntary vessel speed reduction programme for 12 months period (programme will be on yearly basis) then a suitable reduction in dockage fees (port dues) along with the 'environmental award' to the vessel operator can be granted. The limit can be extended to 40 nm in phases.

15.3.2 Voluntary fuel incentive programme: Voluntary fuel incentive programme can be implemented at all ports. if the ships shift from bunker fuel to more expensive cleaner-burning, low sulphur fuel then the compensation based on the difference in the fuel price can be granted based on the reduction in the tariffs. Similarly, the barges and other private crafts operating in the ports for cargo movements if use the cleaner fuel can also be given incentives in the tariffs. The scheme requires nod of the Central Government.

15.3.3 Shore side electricity (Cold ironing): Onshore power is a good option to reduce air emission in the port area but it would require high investments and a significant technical complexity hence may not be a good option as of now, but with the advent of technological development in future this option may be thought of with the alternative usage of natural gas for generation of electricity.

15.3.4 Emission trading Scheme: Emission trading scheme can be implemented by the Ministry of Shipping in conjunction with the Ministry of environment. This is an 'administrative approach' used to control pollution by

providing economic incentives for achieving reductions in the emissions of pollutants. It is sometimes called cap and trade scheme. Central Authority (Ministry of Shipping in collaboration with Ministry of Environment) sets a limit or 'cap' on the amount of a pollutant that can be emitted. The total amount of allowances and credits cannot exceed the 'cap'. Companies that need to increase their emission allowance must buy credits from those who pollute less. The scheme requires strategic consideration at the ministry level with extensive studies from the ministry of environment for setting the cap, measurement of the cap, control measures, its enforcement etc. however, the scheme is attractive and will be help to reduce emission from the ships to a considerable extent.

15.3.5 Green Tariffs for the green ships OR ESI Scheme for the green tariff:

The tariff incentive schemes may be devised for the green ships visiting a port and implemented through the ESI Administration (Environmental Shipping Index is a worldwide applicable mechanism enables 1) all types of ships to measure their air emission performance by means of a web-based tool and 2) ports to promote clean shipping by means of incentives) which maintains the data for the green ships. For providing incentives like concession in Port tariffs. Such discounted tariffs given to green ships can be called as 'green tariff' Green ships are those ships which take measures on board to reduce air pollution by using clean fuels. Details of the scheme are placed at Annexure I. The simple equation in the scheme is increasing performance -> increasing Shipping Index -> less port dues which means with increase in the environmental performance, clean ship index increases resulting into more incentives in the tariff for a ship.

15.3.6 Notification of the Emission Control Area (ECA): This will be an innovative initiatives by the Government in which the ECA will be declared for each port in the territorial water (12 nautical miles from the Coast) initially which may get extended to contiguous zone (24 nautical miles from the coast) in phases where the 'limit of sulphur content in fuel oil inside ECA can be fixed', (In the Baltic ECA the limit of sulphur content in the fuel is 1% m/m presently and 0.10% m/m from 1st January 2015, as per MARPOL Convention).

15.3.7 Carbon foot print inventory and auditing: A carbon footprint is the amount of GHG emissions an individual, organization or event directly or indirectly releases over a measured period. Carbon Footprinting (CFP) can be used to determine GHG emissions from the Port. By developing an emission inventory, Port will know emission sources, track emission trends, and provide information needed to determine area where their greenhouse gas (GHG) can be reduced. The inventory once taken can be reviewed looking to the changes in the pattern of traffic, procurement of the equipments/ vehicles and crafts, increase in the no. of ships visiting a port. Initially it is suggested to find the CFP of the Port operations and the ships visiting the port. In the second phase, CFP of the vehicles visiting the ports can be developed. Development of a carbon footprint will serve as a valuable tool to identify GHG emissions.

15.4 BROAD RECOMMENDATIONS AT PORT LEVEL

15.4.1 Use of cleaner fuel like bio-fuel, low sulphur fuel or alternative fuel such as natural gas or propane in port's equipments and port crafts: In view of the emissions from the port equipments which mainly contain the cargo handling equipments such as cranes, forklift trucks, trailers, tractors, pay loaders and ports crafts such as tugs and different kind of launches, which approximately contribute to the 40% of the air pollution, use of bio-fuels can be the best alternative.

15.4.2 Use of renewable energy: Conserving energy and maximizing energy efficiency of Port operations is highly needed. Uptake of the renewable energy such as wind and solar power will be helpful as ample natural resources are available in India. Solar energy production has a big potential in the port area.

15.4.3 Priority berthing for the green ships: The green ships visiting ports can be given priority berthing which will act as a catalyst to call more and more green ships at the ports.

15.4.4 Use of Priority Fitting of diesel particulate matter filter: Fitting of diesel particulate matter filter in all the port equipments is highly effective in the elimination of PM or soot from diesel exhaust to the extent of 25 to 30%

15.4.5 Use of scrubbers in the Ports crafts: Scrubbing technology was confirmed at the International Maritime Organization's Marine Environmental Protection Committee as a valid alternative to low-sulphur fuels to reduce SO_x in exhaust emissions as well as black carbon emission from ships, IMO MARPOL Annex VI guidelines call for a progressive reduction in Sox emissions globally. The scrubbers can also be well fitted in the port crafts without much involvement of cost.

15.4.6 Painting the surface of Port crafts: Painting the surface of Port crafts below the waterline with specially designed paints would reduce the friction and will increase the energy efficiency which has a direct impact on the less pollution due to low fuel consumption.

15.4.7 Reduction in the idling time of the vehicles: Well-enforced idling time restrictions can save hundreds of gallons of fuel per vehicle and are a cost effective way to substantially reduce diesel emissions from trucks and locomotives, because these sources normally tend to idle for long periods of time at ports. If limit for the idling time is reduced by streamlining the traffic flow, improving gate management, and deploying the persons to enforce the limit strictly, there will be substantial decrease in the emission from trucks. (Bailey & Solomon, 2004).

15.4.8 Port Reception facility: A proper port reception facility of each type of waste such as garbage, sewage, oil sick, bilge water, grey water is required to be provided in each port to avoid discharges by ships in the sea which has adverse impact on the surrounding area of sea.

15.4.9 Sustainability in the Tender Condition/ Lease Agreement: Tender document/ Lease Agreement should contain a condition regarding the project equipments, building material, etc. to be adopting the environment friendly norms and following the eco friendly practices. Tenders which are not unwilling to meet the port's requirements should out rightly be rejected. Prior study must be made on technical and financial feasibility of the requirements. Like wise Agreements with the operators should mention about the emission reduction measures. Once agreed, the agreement is legally binding for ensuring implementation of measures.

15.4.10 ISO 14001 – A tool to make the ports green: ISO 14001, itself may not cover the “green port” concept par-se since it is a new and emerging phenomenon. . As a primary initiative, in ISO 14001, “green port” may be incorporated as an ‘objective’ and after adaptation evaluation, measurement and control should be done with reference to objective and redefining the objectives after attainment of the already defined one.

15.5 HAZARDOUS CARGO

15.5.1 Hazardous cargo connotes to the cargo such as explosive, flammable, toxic, corrosive and reactive. They are harmful to environment when released. However, when handled properly the effect on the environment is minimal. Contamination of soil and water from leaking storage tanks, flammable vapours in the enclosed area, hydrocarbon vapours during transmission, air releases from chemical storage or fumigation activities, solid and hazardous waste generation from the dangerous cargo handling and storage, release of hydrocarbon during bunkering activities are the causes for the air pollution and fatal accidents. The recent example of Chlorine gas leak at Mumbai is the example of its impact on local habitants which has resulted in banning of handling of such cargo in Mumbai Port. Proper precautions are therefore necessary to avoid fatal accidents and inconveniences on account of odour. India imports approximately 70% of its oil requirements. Most of the crude oil is imported through the 13 major ports, besides SPMs installed by Oil PSUs in the Port Waters. The concentration of high volatile energy products at the ports have made them vulnerable from the environmental angle besides the safety of handling. All Indian Ports handles almost 180 million metric tonnes of POL products and hazardous chemicals of different types which also includes dangerous goods and contribute almost 32% of total traffic handled at these ports.

15.6 DIRTY & DUSTY CARGO

15.6.1 Looking to the hot and dry climate at the Indian ports, dust due to handling of the dry bulk cargo is the common phenomenon. Dust is the cause of many respiratory diseases and affect the health of the port workers, inhabitants of the

nearby localities and also flora-fauna. Dry bulk which mainly contains coal, iron ore, sulphur, rock phosphate, various kind of ores, bauxite etc. which contribute approx. 30% of the traffic volume of the Indian Ports. Presently 179 millions of dry bulk cargo is handled which is expected to grow at 7 to 9% CAGR by the end of 12th five year plan. Hence, to reduce dust various remedies in terms of handling techniques, technologies etc. to be looked for. In many ports, handling of dry bulk products have applied technical measures such as sprinkling devices, spraying vehicles, verges around the terminal, etc. to prevent dust emission. At some ports the air quality is regularly monitored for Suspended Particulate Matter (SPM) and Respirable Suspended Particulate Matter (RSPM) levels around the places where dusty cargo is handled. The test reports are regularly submitted to Pollution Control Authorities.

15.6.2 An attempt has been made to identify the Hazardous cargo, Dirty cargo and the Dusty cargo being handled at Major Ports, which is presented as under:

(A) List of Hazardous cargo and its classification

Hazardous Cargo	IMDG Class
POL (Crude, HSD, SKD & MS)	3.0
Sulphur	4.1
Sulphuric Acid	8.0
Phosphoric Acid	8.0
Ammonia	2.0
	Class 3
Styrene monomer	
Alcohol	
LPG & Ammonia	Class 2
Suphuric acid, Phosphoric Acid & Caustic soda lye etc.	Class 8
Alumina powder	Class 4
Ammonium Nitrate	Class 5
Molten sulphur	Class 4
Coal tar pitch	Class 9

(B) List of Dirty cargo

- i. Coal - Coking & Non – coking
- ii. Manganese Ore
- iii. Gypsum
- iv. Finished fertilizers (Import)

- v. F.R.M. (Import)
- vi. Bentonite (Export)
- vii. Iron Scrap (Import)
- viii. Ores (Import & Export)
- ix. Lead concentrate (Import & Export)
- x. Zinc concentrate (Import & Export)
- xi. Copper concentrate (Import & Export)
- xii. Clay (Import)

(C) List of Dusty Cargo

- i) Iron Ore
- ii) Iron Ore Fines
- iii) Pig iron,
- iv) Alumina,
- v) Bauxite,
- vi) Limestone,
- vii) Sulphur,
- viii) Rock phosphate,
- ix) Soya been extracts
- x) Finished fertilizers (Import)
- xi) Iron Scrap (Import)

15.6.3 The various type of dirty, dusty and hazardous cargo handled and their handling system at ports and its handling system is enumerated in Annexure I.

15.6.4 Being the vital commodity, its handling can not be neglected. However, precautionary measures through prevailing safety practices and stringent regulations are required for their safe handling. It is also observed that in the absence of proper Rules and Regulations, the dangerous cargo keep lying in the ports for indefinite period and custody is not claimed. This is not only dangerous from the safety angle but also hazardous in a longer runs as it involves the residue disposal problem impacting the environment.

15.6.5 Following standard procedure already circulated by the Ministry of Shipping are noteworthy to be mentioned while handling of the dangerous and hazardous material in the Port area.

- Installation of Radioactive Detection Equipment in all the ports in time bound manner.

- Full details like quantity, physical and chemical characteristics of the substances as per IMDG Code, kind of package, storage requirements, transport arrangement, etc, shall be furnished to Port by the Steamer Agent in advance for planning and confirming the acceptability of the cargo in the Port.
- Hazardous cargo shall be moved out of the Port on landing and in case the cargo requiring storage inside the Port, it may be permitted in nominated area following the standard/ safe storage norms as per IMDG Code on conditional basis for a stipulated time.
- If the cargo is not cleared within a stipulated time as prescribed by the port authorities, Ports are empowered to sell such cargo in Public auction treating them as uncleared cargo.
- License of the defaulting agencies shall be suspended and action will be initiated against them under the respective provisions of the Port Act & Rules thereon.
- The handling and storage of hazardous cargo whether by Port or by private operator shall be strictly monitored by Chief Fire Officer/ Safety Officer under the overall supervision and responsibility of Deputy Conservator of the Port.
- All hazardous containers may be allowed direct delivery/ shipment without stacking in the yard.
- A defined time limit may be prescribed for various activities to be performed by various agencies involved in the process starting from confiscation of dangerous and hazardous goods till their final disposal.
- End Users viz. importers/ exporters shall be made accountable to cover all risks while handling, storing and delivery of containers.
- Stringent action to be taken against the defaulting Steamer Agents including payment of compensation in case of their failure to declare the detailed particulars of highly hazardous cargo carried by their vessels in advance.
- In case of non-observance of the formalities as stipulated by Port Authorities from time to time for discharge of such cargo, ports are entitled to take action as per the available legal provisions.

- Separate storage space outside the operational area or residential areas located in the near vicinity of the port to be developed by port trusts for storage of unclaimed/ uncleared / confiscated dangerous and hazardous cargo.
- Safety officers posted should possess specialized knowledge in handling dangerous / hazardous cargo.

15.6.6 Suggestive general requirements for “keeping” of the dangerous cargoes in a port are enumerated below:

- Limited keeping duration
- Isolated / remote location with good access and one-way traffic
- Open air area, umbrella sheds, closed warehouse- all with segregation possibilities
- Fenced in, paved (no tar paving), closed drainage, lighting (Explosive proof), warning signs painted marking floor,
- Special classes in separate locations, special area for the damaged dangerous good.
- Fixed and portable fire detection and fighting installations and equipments.
- Operational, protective and emergency equipments.
- Communication means, established operations, documentation and MIS procedure and Contingency planning.

15.7 Broad Recommendations

15.7.1 Water Curtains for the coal storage area to prevent the coal dust flying from the storage yard and spreading through the port will be a good solution.

15.7.2 Generally accepted solution of tree plantation will be useful to mitigate the effect of CO₂ emission. Massive tree plantation should therefore be taken up by the ports.

15.7.3 Use of enclosed conveyor systems, Eco friendly pipe conveyor system, Continuous Ship Unloader (CSU) in handling dusty cargo can be a good measure. Though it is costlier for the long distances, short distances are preferable for these types cargo handling system for the bulk dusty cargo.

15.7.4 There is need to formulate the regulations for removal of hazardous cargoes from the port and prescribing a time limit for their storage in the port area. The time limit should take into consideration the various factors such as class of explosives i.e. magnitude of volatility, proximity of the inhabitants to the port, density of population of the nearby port, distance between port and the communities.

15.7.5 Following the IMDG Code and the MSIHC Rules 1989 (Promulgated under the Environment (Protection) Act, 1986) will be helpful to deal with the dangerous good. IMDG Code is an international code whereby classification of various dangerous and hazardous goods and manner of handling them have been prescribed and contains advice on terminology, packaging, labeling, placarding, markings, stowage, segregation, handling, and emergency response whereas MSIHC Rules 1989 are National Regulation prescribe the remedial & punitive clauses also in case of non- compliance/default in statutory provisions. However, the distinction between the two with regard to the definition of the 'hazardousness' itself is required to be made for clear directions in handling these goods.

15.8 BALLAST WATER MANAGEMENT

15.8.1 Over 90% of the world cargo is mobilized trans-oceanically and nearly 10 billion tones of ballast water is filled at one part of the ocean and discharged at the other. In doing so it introduces wide range of living organisms, including pathogens, into alien regions, usually along the coasts of the continents. These organisms can establish and invade an environment, if found suitable and pose economic and human health hazards. Many cases of marine bio-invasion have been reported and their harmful effects on the ecosystem and human health have been

documented. Therefore marine bioinvasion has been considered as one of the greatest threats that are challenging the health of the oceans. In addition, all tankers carry sea water ballast when they do not have cargo on board. This ballast is carried in the cargo tank and must be discharged before new cargo can be loaded. These tanks contain residues of previous cargoes and so it is necessary to clean the tanks in order that the ballast which is discharged in the loading port does not pollute the harbor. It is inevitable that some oil will enter the sea during this process. Realizing the importance of this issue the International Maritime Organization (IMO) had formulated the International convention for control and management of ship's ballast water and sediments in 2004. The convention includes various guidelines and standards that are required to be followed by all the maritime countries.

15.8.2 As per the IMO convention, various ballast water management options can be utilized in the following ways:

- mid-oceanic exchange,
- ballast water risk assessment and
- ballast water treatment technologies.

In addition, the studies pertaining to establishment of data bases through port biological surveys and locating appropriate site(s) for ballast water discharge in emergency situation will also help in managing ballast water.

15.8.3 National Institute of Oceanography (NIO) has been identified by the Ministry of Shipping, Govt. of India as a lead R&D agency in addressing the ballast water management issues and preparing comprehensive port specific management plans for the country. In this regard, initially the institute completed work related to port biological baseline surveys, ballast water risk assessment and identification of ballast water discharge sites for the ports of Mumbai, Jawaharlal Nehru, Mormugao and Visakhapatnam under "Globallast" and "Government of India initiative" programs. Through this program NIO also developed a user friendly and self validating e-form for reporting ships' ballast water history, which is an essential requirement for conducting ballast water risk analysis.

15.8.4 It is now envisaged to extend these efforts to the remaining 8 major ports (Mangalore, Cochin, Chennai, Haldia, Kandla, Tuticorin, Paradeep and Kolkata) of the country, through an Memorandum of Understanding (MoU) between NIO and the Directorate General of Shipping (DGS). This will enable NIO to prepare a comprehensive port specific ballast water management plan for these ports to fulfill following objectives during 2010 to 2016:

- To carry out Port Biological Baseline Surveys
- To conduct Ballast Water Risk Assessment.
- To Develop Geographical Information System on ballast water management
- To identify suitable site for each port, through modeling studies, for discharge of ballast water in emergencies situation.
- To conduct on-voyage Ballast Water Sampling.
- Implementation of Electronic Ballast Water reporting form.

15.8.5 In addition to above, it is suggested that **following precautions** to be taken while allowing vessels to berth at port:

- The ballasting/de-ballasting operation shall be carried out by the Vessel as per provisions of GEF/UNDP/IMO Global Ballast Water Management Programme. The Vessel shall submit information as per IMO Ballast Water Reporting Form.
- The waiting Vessel at anchorage shall retain full ballast on board until a confirmed berthing plan is communicated to the Vessel by the Port Traffic Control.
- The term "over-side discharges" refers to the discharge of any solid waste or any liquids from a Vessel other than ballast water. Vessel's garbage must be retained on board in suitable containers with properly fitted covers. Garbage, dunnage and scrap materials should not be dumped in Indian Territorial Waters. Burning of Vessel's garbage is not permitted within the Port Limits.
- The Vessel shall not discharge hold washings and raw sewage inside the Port.
- The Vessel shall have all its scuppers properly plugged while at berth.
- The Vessels shall follow the MARPOL guidelines while dealing with garbage, raw sewage and hold washings.

15.9 OIL SPILLAGE

15.9.1 The increase in the world's oil trade had the unpleasant side effect of pollution, as the tonnage of oil transported by sea increased year by year, so did the possibility of accidents. The other factor was the arrival of the VLCC and ULCC and the realization of the potential damage from such bigger ships which could result an oil spill in large quantity following accident to one of these ships or both. There are two major dangers concerning the transport of oil. The first danger is that of fire and explosion- always present when oil is being handled. All petroleum products give off vapours although in some circumstances, such as with fuel oils, they have to be heated first. These gases when mixed with air are flammable and easy to ignite. The second danger is that of pollution. When oil is spilt at sea as result of an accident or part of tanker operation, the potential for destruction of marine life and damage to coast line can be enormous. To combat such enormous problems of oil spillage, following broad recommendations are made:

- The relevant rules and associated statutory plans should be reviewed periodically.
- Implementation of related enacted provisions of the national laws needs to be made more effective.
- OPRC / NOS-DCP related requirements need to be mandated so that compliance is effective and productive.
- Indian Ports Act, 1908 need to be amended to empower Central Government to implement provisions related to Safety, Security, Prevention of marine environment, pollution Response and liability related International Conventions.
- Detection of violations in respect of oil pollution regulations need to improve. Coast Guard therefore, should have day and night capabilities to check such violations.
- Coast Guard / Port Officials need to be trained to collect samples of spilled oil from ships /sea / Ports or other places etc. and have expeditious method of testing the sample to establish the violation, if any.
- Penalties / Fines need to be adequate to discourage violation or Act as a good deterrent.

- Man power of the maritime administration i.e. Directorate General of Shipping need to be augmented to have better PSC / FSI controls, to be able to conduct timely investigation into violation and identify substandard vessels which may lead to oil pollution in Indian waters.
- Navigational control to enhance safety and efficiency of navigation need to improve for the purpose of providing better navigational safety domain awareness through establishment of vessel traffic services, ship routes such as TSS, Recommended route, Safety Fairway, Round about and precautionary area etc.
- Emergency towing vessels for the purpose of extending salvage services to dead ship or ships in need of assistance etc. need to be pressed in service at the earliest.
- Indian ports or places also need to have adequate mitigating and preventing response equipments and resources such as port crafts which can be used as emergency towing vessels.
- Shore oil reception facilities need to be strictly implemented in all ports or places.
- National Marine Environmental policy need to be formulated by Coast Guard in consultation with Ministry of Shipping, Ministry of Environment and Forest and Directorate General of Shipping etc. This policy should be reviewed by the concerned authorities of the Government at periodical interval.

15.9.2 Ports should devise their strategies to ensure that following provisions are made to combat oil spill:

- To ensure that at least the following minimum equipment are kept available locally at all the times:
 - i. Inflatable Boom
 - ii. Dispersant spraying equipment capable of being mounted on surface craft
 - iii. Suitable dispersant chemicals of the nature and quantity estimated as requirement of the Local Action Group as part of Local Contingency Plan.
 - iv. Oil Skimmer equipment

v. Surface craft on which above dispersant equipment can be mounted and can be used for rigging boom, etc.

- To arrange training of personnel expected to be engaged in above operations.
- To arrange for periodical exercise under the guidance of the Regional Coast Guard Commanders (RCC) to keep equipment & personnel on continuous readiness for oil spill response operations.
- To consult the coast Guard, the DG shipping or any other authority, when further advice/assistance is required.
- To keep the Coast Guard apprised of action being taken.

15.10 PORT-CITY CONFLICT – NEED FOR A PARADIGM SHIFT

15.10.1 In examining port – city development it is useful to understand “the seeds of conflict” between the port and the city which have worked to disrupt a formerly harmonious relationship. Cargo handling equipment which has grown from simple cranes handling break-bulk cargoes, to specialized container and bulk handling machinery which dominate city skylines, and often generate dust, noise and water pollution. Cities also need space, and the port often occupies prime urban and waterfront areas whose best use may no longer be the handling of cargo. Recreational use of the waterfront occupied by the port is seen as important to enhancing the quality of city life. Port Traffic consisting of large, noisy, polluting trucks transiting city streets add to traffic congestion, which has become a major concern for the metropolitan cities. Large investments in transport infrastructure are needed but not always possible due to space and funding constraints.

15.10.2 Despite these tensions, the importance of the economic benefits generated by the port in the port-city relationship is generally well recognized by the city. Nevertheless, there is sometimes a need to consider relocation of some port facilities away from urban areas due to their large negative externalities. Preserving those aspects of port activities that benefit the city, while moving others out, requires joint development strategies for the port and the city. Some of this is already happening at India’s major port cities. For instance each of them have developed alternative locations for port expansion – Chennai with the development of Ennore

Port, Kolkata with the Haldia Docks, and Mumbai with the Nhava Sheva Port in Navi Mumbai. However, fully seizing and benefiting from these opportunities will require specifically strengthening and empowering integrated approaches to port-city development.

15.10.3 Presently, the regulatory framework for India's Major ports largely ignores the challenges of port-city development. The governance framework, the planning and budgeting of port development, and even the appointment of the Port Trustees under the MPTA of 1963, are all centrally controlled and have few linkages for an integrated approach among the port authority, concerned local bodies, and the other agencies (railways, highways, urban development) that critically need to contribute to the process of integrated port planning and development. About the only area where the regulatory framework has recently recognized the urban context, is in the area land policy, and even here the policy is rather restrictive and relatively recent. Attempts by the Major ports to enhance their revenues through innovative land uses are often stymied by slow and ambiguous decision making both at the port level and at the centre. Recognizing the problem, the Ministry established the Buddhiraja Committee which made three sets of recommendations, one each for Kolkata and Mumbai, and a third for the other Major ports. Based on the latter the Ministry announced the Land Policy for Major Ports in March 2004 amending the MPTA of 1963, but excluded the ports of Mumbai and Kolkata from its purview.

15.10.4 CITIES UNDER PRESSURE : The three Major Ports of Chennai, Mumbai and Kolkata, each in different ways, offer tremendous opportunities for the economic development of their host cities. They can also do much to improve the quality of life for city inhabitants. However, the regulatory and organizational obstacles to integrated port-city development have resulted in these opportunities remaining largely untapped. Even though, as noted earlier, they have each developed alternative port locations at Ennore, Navi Mumbai and Haldia, the pay-off for the city and its residents has been limited to just some diversion of traffic from city streets and not much else. If anything, this has resulted in a deterioration of the conditions surrounding the port. As the port loses revenue, employment and political significance, there is a consequent negative impact of blight and decay in adjacent urban areas. It is useful here to elaborate a little on each of these port-city situations

to highlight their potential, and spur some long overdue action. It has been noticed that there is a clear conflict between the Ports and the Port Cities, due to continuous development taking place in the port area. While industrial and commercial activities at the port are vital to the prosperity of the region, they also have generated concerns about pollution and stress on the resources. The increased commercial activities have exerted pressure on the ecology and environment surrounding the port. Number of NGOs and other fora of the cities quite often raise the issues of damage to the close-by habitation due to port pollution and safety on account of handling of the hazardous and dangerous good.

15.11 BROAD RECOMMENDATIONS

15.11.1 Port of Mumbai, Kolkata, Chennai and Visakhapatnam are the examples of such critical development where both have impacted each other. Because of saturation of the local communities around the port, the development of the ports has already stagnated. Ports are not in a position of further expansion resulting into non generation of traffic and addition of trade. On the other hand, the nearby local residents are highly impacted due to the environmental impact of the port. It is therefore time to think to take away these ports from the cities/ nearby inhabitants and the following steps re required to avoid such conflicts:

15.11.3 It is therefore need of an hour to shift the port operations. Two strategies in this regard can be thought of namely either Ports or its development to take place outwards i.e. towards outer harbour etc. meaning thereby port and the cargoes to be re-located in safer heavens or the habitations to be shifted to some other safer places. Alternatively, ports may be specifically nominated for handling particular cargo/es, looking to their location, preference and facilities.

15.11.4 The original port site which is shifted can be made use of by developing a maritime museum, recreational facilities, Yatch / crafts securing places, port based SEZ for the entertainment and other amusement facilities and a mass storage place for the non hazardous and green cargo.

15.11.5 There exists a need for a different organizational approach to Chennai, Kolkata and Mumbai as compared with that of the other Major Ports; one that is more closely linked to local economic development priorities, but not necessarily identical for all three.

15.11.6 Corporatization of these ports with enhanced powers for land development, involvement of local bodies in planning and enhanced financial powers, will be necessary to unlock the immense potential and value inherent in these ports.

15.11.7 Broadly, the port development and its hazards on the city habitation impact severely which results in conflict between the port and city. Therefore, the port authorities should monitor the development of the ports and prepare a plan for shifting of the new developments or activities in the nearby locations. Since, the population or local habitations alongwith their city bound facilitation centres cannot be shifted, it is obvious that the port activities and other related developments may be considered to be shifted to some nearby un-habitated or barren areas. Keeping in view the various issues particularly the handling of hazardous cargo in-around the port cities, the three major factors are directly linked with the shifting of the port activities on the priority basis:-

- Density of Population in the port city
- Proximity to the port
- Extent of handling of hazardous cargo

15.11.8 It means that more the density of population, more the proximity to the port operations and more the extent of handling of hazardous cargo, there is more severity of hazardness which requires faster shifting of the port activities to some other locations. The same is depicted in the following matrix :-

DENSITY AND PROXIMITY OF POPULATION	SEVERITY OF HAZARDS		Priority of Shifting	
		HIGH		LOW
	HIGH	1 High Mumbai, Chennai, Mormugao, Cochin,		3 Low Kolkata, New Mangalore
LOW	2 Medium Kandla, Haldia, Visakhapatnam, Ennore	4 No Paradip, Tuticorin, JNPT		

15.11.9 In view of the above recommendations, each port trust shall identify and prepare a time bound action plan to shift their hazards cargoes according to severity of hazards to safer havens or shift/re-habilitate the population around the port to distant places by using the MCLA(Maximum Credible Loss Assessment).

CHAPTER - 16

International co-operation and Overseas Investments

16.1 Broad Areas of Co-Operation, Issues and Measures

16.1.1 Investment in India

The sector having the largest potential for absorption of FDI in India is the **infrastructure sector**. Infrastructure development requires huge resources. The Planning Commission of India has estimated that investment in infrastructure – defined broadly to include road, rail, air and water transport, electric power, telecommunications, water supply and irrigation – will need to be of the order of about Rs. 14,50,000 crore or USD 320 billion during the 11th Plan period, therefore, similar amount of investment is expected in 12th Plan period also.. The Indian Government is making efforts for increasing investment in infrastructure through a combination of public investment, Public Private Partnership and occasionally, exclusive private investments wherever feasible. To promote inflow of private capital in infrastructure the Government has placed reliance on promoting Public-Private-Partnerships (PPPs). To meet the requirement of infrastructure projects for long term debt that is not available in the market, a Special Purpose Vehicle (SPV), India Infrastructure Finance Company Ltd. (IIFC), a Non-Banking Finance Company, has been set up that will provide long term debt for more than 10 years, upto 20% of the project cost. Hence, any country capital may take part in reconstruction of ports and harbours, etc.

- ◆ Investments into Special Economic Zones can also be of interest of worldwide companies. It is a duty-free enclave, which is given the status of a foreign territory for the purposes of trade, duties and tax collection. Enterprises working in such zones are under special tax regime. Special economic zones may be interesting to companies engaged in IT; other high-tech and research-based sectors/industries

16.1.2 **Area of concern**

Indian Ports desire following Area of concern:

- **Human Resource Development**
 - One year on the Job Training in other countries – (Developed countries only – Antwerp Port, Singapore Port, Shanghai Port, Rotterdam Port etc)
 - Training on each discipline and multi disciplines concerning Ports and Harbours
 - Training of Seafarers
 - Bilateral Agreement with World Maritime University for education services such as (Sri Lanka has such an agreement)
 - ✓ Professional Development Courses
 - ✓ Master’s program for Port Officers / Decision Makers
 - ✓ PhD programs in Maritime and Port Operations
 - Strengthen Maritime Education Infrastructure
 - ✓ Increase skilled manpower resources to meet the demands of International Maritime and Port sectors that will stamp Indian presence in the global maritime sector.
 - ✓ Inculcate / awareness of best practices in Maritime and Port Sector.
- **Technical & Operational Co-operation for sharing the expertise :**
 - Container Operation Areas
 - Cargo and Logistics including Containerization
 - Bulk Terminal
 - Emergency towing vessel
 - G2G co-operation for port operations
 - Best Practices in Port Management
 - Cruise Operations tie-ups / investments in coordination with Tourism Ministry

- Environmental & Pollution Control Measures – Zero dust systems for coal / iron ore terminals, mandatory green belts within port perimeters, mango grooves for controlling sea erosion.
- **Ports Security:**
 - Collaboration with US
 - Compliance to ISPS regulations and Best practices in Port Security
- **Coal & Mine Financing:**
 - co-operation or collaboration may be sought in Coal & Mine financing by respective ministry while allied Port operation in other countries by Ministry of shipping.
 - It is suggested that Ports to work as catalyst to acquire coal mines, other raw materials overseas through Indian companies.
 - Identify and develop dedicated coal terminals / Jetties to complement the Ultra Mega Power Coal based power projects.
- **Group 20 Nations**
 - The presence of Indian to be felt in Group 20 nations of Indian Ocean. Therefore, Indian should take leading role in collaboration with G-20 countries
- **Strategic Investment**
 - It is suggested that India can explore the strategic investment in other countries like Singapore target needs to be third world countries and then the established terminals in developed countries.
- **Explore the possibilities in other countries for participation in Ports investment.**
 - India should explore the possibility for trade facilitation with other countries.

- Bilateral and multiport agreements will benefit country's trade. But any investment or agreement needs to come with adequate knowledge transfer.
- Investments in SPVs for maintaining port infrastructure, providing tugs / pilot services and other allied services including consulting services in various international ports.
- **Indian Ports' Global :**
 - PSA have established their wings in different part of the world by an instrument called PSA international. Similarly, Dubai Ports have too spread its wings internationally by the consolidated company viz DP world. Since, India is bestowed with rich maritime heritage and immense expertise in operating ports with highly skilled manpower and specialized knowledge in port operations, India must also float a special purpose vehicle for making investments in ports abroad and become a truly global power in Port Sector world-wide. It is envisaged to incorporate a new special purpose vehicle viz. Indian Ports' Global (IP Global). The following areas of co-operation can be explored:
 - ✓ Implementation of PCS at other countries where similar customs rules and regulations are in effect.
 - ✓ Green Ports

16.1.3 **Various type of Co-operation**

Cooperation between shipping organizations and enterprises

- ◆ Establishment of Maritime Council
- ◆ Increasing of Shipping Lines between countries

Cooperation between Maritime Educational Institutions and Development of Human Resource Capacity

- ◆ Exchange of staff and students from educational institutions with special support for women
- ◆ Training of seafarers through provision of sea training facilities
- ◆ Develop train-the-trainer programme to build a pool of trainers
- ◆ Development of a pool of Safety Auditors with emphasis on women auditors

Exchange of data and information on the flow of commercial goods at sea and ports

- ◆ Identification of the type and format of information that could be exchanged on agreed intervals between countries

Cooperation between maritime administrations on maritime regulatory functions

- ◆ Exchange of employees, technical experts and advisors
- ◆ Share best practices on ship registration methods and models
- ◆ Share best practices on maritime casualty investigation methods
- ◆ Share best practices on maritime security practices including LRIT reception capabilities
- ◆ Share best practice on sustainable use of Inland waterways and regulatory regime for safety thereof

Cooperation in ship building and repair

- ◆ Facilitation of contacts between Ship building and Ship repairing units
- ◆ Identification of key investment opportunities in ship repair and ship building

Cooperation in port development and Port Handling Technology

- ◆ Exchange of knowledge on port master plans
- ◆ Exchange of best practice on port economic regulatory models
- ◆ Identification of key investment opportunities in Port Handling Technology
- ◆ Facilitation of contacts between Private/Public sector Port handling enterprises
Exchange of knowledge in the Dredging Operations

Development of regional maritime hubs

- ◆ Development of transshipment hub facilities in the respective Countries
- ◆ Enhancement of bunker facilities in ports of respective countries

Cooperation in Ballast Water Management Techniques

- ◆ Exchange of Best Practices on Ballast Water Management Systems

16.1.4 Countries

The mutual co-operation in the field of Sea Ports can be sought with

- Government of the Kingdom of Denmark
- Government of the Hellenic Republic, Finland
- European Union
- Government of Denmark
- Government of the Syrian Arab Republic
- Government of Finland
- Government of Africa
- Government of Arab Republic of Egypt
- Federal Government of Nigeria
- Belgium Luxembourg Economic Union (BLEU) authorities
- Government of Kenya

- Jamaica
- Kenya
- Russia
- Iran (Shahid Rajaei Port)
- Spain (Port of Gijón)
- Sultanate of Oman for a stake in development of port near Sallalah
- Holland
- Singapore
- Japan, etc

16.1.5 **Issues and Barriers**

- The need of change in the provisions in MPT Act for overseas investment so that Ports can investment directly. Alternatively, it was suggested that investments can be made through financing arm of Indian Ports' Global.
- Double Taxation with respect to taxes.
- Poor information exchange. It is essential to establish exchange of information on a regular basis about projects having potential areas of c-operation and to set up information channels on continuous basis, information about business opportunities in India. This may be done through regular exchange of information between identified reputed Trade Bodies.
- Lack of information on the state-sponsored tenders held in India.
- **Transparency:** Transparency through mutual sharing information is the key to success of bilateral commercial and economic relations. It is recommended that the process of sharing information on trade policies, investment opportunities may be institutionalized.
- **Legal environment:** information on legal environment for business activities in India in terms for establishing trade and investment ties, market

information, administrative procedures and guidelines, Customs regulation, etc. may be made available on website.

16.1.6 **Institutional and legal Measures**

The following measures can increase the level of investment co-operation between India and any other country:

- i. Facilitating the utilization of Rupee debt for implementation of large joint investment projects in the industries which are priorities for any country.
- ii. Establishing dedicated information agencies spreading on a regular basis, information on business opportunities in India.
- iii. Spreading information on the opportunities of financial institutions (including banks, insurance organization, stock market, etc) in terms of investments.
- iv. Signing agreements on co-operation between financial institutions of other countries.
- v. Establishment of Regional Business Councils of India for companies from different Indian states to assess properly trade opportunities and prospects, to find partners and proper business mechanisms in the countries.

16.1.7 **Objectives**

- ◆ Promote mutual cooperation for the benefit of member ports of the respective organizations by exchange of information, technical expertise and training need on multi-disciplines concerning Ports and Harbours.
- ◆ Establish mutually identified centers for collection, compilation and dissemination of information concerning ports and Harbours of the region for the benefit of the member ports and other interested stakeholders.

- ◆ Explore the possibility of forming joint ventures of mutual interest between the member ports of both the countries for participation in port investment.
- ◆ Promote synergy and trade facilitation between member ports of both the organizations.

16.2 Framework of Indian Ports' Global

16.2.1 It is proposed that IP Global may be formed as limited liability company under the Companies Act, 1956. IP Global may be formed to serve as a holding company, which will pool the financial resources and act as an investment arm. The investments by IP Global may be in the following forms:

- lending for setting up and modernization maritime projects and for creation of core and common infrastructure.
- Investing in equity of its subsidiary companies and
- Investing in select Project Assets and Facilities (PAF)

16.2.2 This structuring would facilitate IP Global to secure non-Banking Finance Company status and thus would facilitate easy tapping of market as per the requirements. Progressively, IP Global may get itself notified under section 4A of the Companies Act, 1956 as a public financial institution to have the advantages of reaching out to more than 49 investors.

16.2.3 This strategy is in line with many successful companies like power Finance Corporation Ltd, a successful Nav Rathna, formed in the year 1986, which was notified as a public financial institution in the year 1990 and obtained registration from Reserve Bank of India as Infrastructure Finance Company (NBFC – ND-IFC) in the year 2010.

16.2.4 Equity Structuring: To have the right mix of Equity and Debt to achieve the ideal financial leverage, IP Global may be formed with an authorized capital of

Rs 5,000 crore. This would be suitably increased in future as per the needs. The initial equity capital (paid up) of Rs 3,000 crore may be sourced as

- Rs 1500 crore, representing 50% from Major Ports – especially from Internal Resources of JNPT, MBPT, KPT, VPT, ChPT, PPT, which is reflected in chapter – 6 also.
- Rs 780 crore representing 26% from strategic partners (across the globe) who would be able to add value at the Board level and at the operation Levels.
- Remaining Rs 720 crore from Public Financial Institutions, Insurance Companies, Commercial Banks and Infrastructure Development Companies and Public.

16.2.5 IP Global may invest in and promote the following target segments to promote the integrated maritime and associated activities of India: Investments may be made in the form of equity participation, debt financing, and equipment leasing to port sector.

- a) Presently, the debt components of projects of concessionaire SPVs are funded by commercial banks, financial institutions by means of term loans and External Commercial Borrowings. Substantial time is taken by the SPVs in achieving financial closure and this delays achievement of COD. IP Global may extend debt finance to these SPVs.
- b) IP Global may also directly invest in capital dredging of major ports to increase the existing draft to receive mother vessels and VLCCs and thereby improve the non-transshipment traffic from and to Indian ports.
- c) IP Global may play the role of co-promoter jointly with concessionaire SPVs under the TOOL Port Model, a successful practice of investment adopted in Latin America. Under this Tool Port Model, IP Global may invest directly in the select PAF (civil structures, jetties and creation of required draft having a life

span of 100 years) required for the projects and the concessionaire SPVs may invest in top side facilities (cranes and machineries having a life span of 10 years). IP Global and the concessionaire will share the revenue as in the existing approved model of concession agreements.

16.2.6 The initial issue of TFIB may be made for Rs.5,000 crore with a tenor of between 10 to 15 years. This would result in a Debt Equity ratio of 1.67, a right mix considering the long term nature of this sector. On the basis of primary evaluation of target investors and compliance of the required procedures, the TFIB may be raised through private placement or through public/ retail issue in one or more tranches.

16.2.7 Section 10(15)(iv)(h) of the income Tax Act, 1961 fully exempts the interest earned by any investor from bonds or debentures issued by any public sector company, subject to the conditions as may be stipulated by the Central Government in the notification to be issued for this purpose.

16.2.8 In addition, the newly introduced section 10(47) of the income Tax Act, 1961 (with effect from June 1, 2011) fully exempts any income of any notified infrastructure debt fund set up in accordance with the guidelines as may be prescribed. The guidelines on this aspect are awaited. On issuance of these guidelines, this option of raising financial resources may also be considered.

CHAPTER - 17

ABSTRACT

17.1 ELEVENTH PLAN SCENARIO

17.1.1 Outlay and investment

17.1.1.1 The original approved 11th plan outlay and the actual expenditure are as follows:

(Rs. in Crores)

Sl. No.	Name of Sub-Sector	Approved 11 th Plan Outlay	Anticipated Expenditure
(A)	Major Ports	17551.24	5566.16
(B)	Others:	12753.92	2118.45
	TOTAL (A+B):	30305.16	7684.61

17.1.2 Traffic Handled

17.1.2.1 Commodity-wise traffic handled by **Major Ports** during the first four years of 11th plan period and the estimated for the year 2011-12 are as below:

Year	Traffic handled (Million Tonnes)						
	POL & its Products	Iron Ore	Fertilizer and FRM	Coal	Container	Other Cargo	Total
2007-08	168.75	91.80	16.63	64.93	92.27	84.94	519.32
2008-09	176.14	94.04	18.23	70.40	93.14	78.59	530.54
2009-10	175.09	100.33	17.72	71.71	101.24	95.00	561.09
2010-11	179.17	87.06	19.99	72.73	114.11	96.97	570.03
2011-12 (Estimated)	182.28	86.83	20.60	86.06	122.77	102.06	600.60

17.1.2.2 Commodity-wise traffic handled by **Non-Major Ports** during the first four years of 11th plan period and the estimated for the year 2011-12 are as below:

Year	Traffic handled (Million Tonnes)						
	POL & its products	Iron Ore	Fertilizer and FRM	Coal	Container	Other cargo	Total
2007-08	91.04	34.22	7.11	15.44	11.05	47.52	206.38
2008-09	97.82	35.86	8.86	21.46	11.97	37.25	213.22
2009-10	145.15	49.06	6.33	41.37	14.85	32.56	289.32
2010-11	153.48	42.50	10.98	58.52	17.56	31.60	314.64
2011-12 (Estimated)	188.00	51.00	11.00	77.00	19.00	24.00	370.00

17.1.2.3 Comparison of actual traffic with the traffic projections given for the first year and the terminal year of 11th plan in the working group report is as follows:

(In Million Tonnes)

Commodity	2007-08		2011-12	
	Projected	Actual	Projected	Estimated
POL	247.65	259.79	378.45	370.28
Iron ore	114.30	126.02	128.04	137.83
Coal	93.99	80.37	138.94	163.06
Other cargo	123.00	156.20	193.59	157.66
Containers	86.54	103.32	169.93	141.77
Total	665.48	725.70	1008.95	970.60

17.1.2.4 The anticipated combined traffic of Major and Non-Major ports in the terminal year of 11th plan is likely to be around 970.60 Million Tonnes as against the

11th plan terminal projection of 1008.95 Million Tonnes, thus showing a decrease in traffic of about 38.35 Million Tonnes.

17.1.3 Port Capacity:

171.3.1 The aggregate commodity-wise capacity at Major Ports at the beginning of the 11th Plan and capacity added during the 11th Plan period are given below:

(In Million Tonnes)

Sl. No.	Commodity	Capacity as on 31-3-2007 (Reassessed)	Capacity Addition during 11 th Plan	Capacity as on 31-3-2012
1.	POL	174.70	56.56	231.26
2.	Iron Ore	57.50	26.00	83.50
3.	Coal	46.25	22.20	68.45
4.	Containers	88.08	51.32	139.40
5.	Other Gen. Cargo	138.22	41.97	180.19
	TOTAL:	504.75	198.05	702.80

17.1.3.2 The total capacity port-wise at the beginning and end of 11th Plan is as follows:

(In Million Tonnes)

Sl. No.	Name of the Port	Capacity at the Beginning of 11 th Plan (As on 31-3-2007)	Capacity at the end of 11 th Plan (Anticipated) (As on 31-3-2012)
1.	Kolkata	13.40	16.35
2.	Haldia	43.50	50.70
3.	Paradip	56.00	85.50
4.	Visakhapatnam	58.50	74.63
5.	Chennai	50.00	79.72
6.	Ennore	13.00	31.00
7.	Tuticorin	20.55	33.34
8.	Cochin	20.15	40.98
9.	New Mangalore	41.30	50.97
10.	Mormugao	30.00	41.90
11.	Mumbai	44.65	44.53
12.	J.N.P.T.	52.40	65.87
13.	Kandla	61.30	87.31
	TOTAL:	504.75	702.80

17.2. TWELFTH PLAN PERSPECTIVE

17.2.1 Outlay and Investment

17.2.1.1 During 12th Five Year Plan, the overall requirement of funds for Port Sector is estimated to be around Rs 183890.88 crore, out of which Rs. 77058.20 crore has been project will be taken up by Major & other organizations and Rs 104808.00 crore will be taken up by Non Major Ports. Private Sector participation in provision of port facilities at various major ports and non-major ports is envisaged in a big way as mentioned in Chapter-6 of this Report.

17.2.1.2 Out of Rs. 77058.20 crore, projects costing about Rs. 13416.18 crore will be taken up by Major Ports, Dredging Corporation of India, Andaman Lakshadweep Harbour Works, etc. either through their own Internal Resources/Inter Corporate Loans or by obtaining Budgetary Support from the Central Government and Rs. 51036.56 crore will be funded by the schemes to be taken up through private sector.

17.2.1.3 The envisaged Financing Pattern is as under:

Sl. No.	Source of Funding	Rs. in Crore
1.	Internal Resources	15388.18
2.	EBR and Others	6294.99
3.	Budgetary Support	4338.47
4.	Private Sector	51036.56
	TOTAL:	77058.20

17.2.1.4 The break up of the above financing pattern for major and other organisation is as under:

**12th PLAN OUTLAY FOR MAJOR PORTS and Other Organizations
[FUNDING PATTERN]**

(Rs in crore)

Sl. No.	Ports	12 th Plan Outlay	Funding Pattern			Private Sector
			I.R.	GBS	EBR and Others	
(A) MAJOR PORTS						
1(a)	KOLKATA	73.91	73.91	0.00	0.00	2553.38
1(b)	HALDIA	338.05	338.05	0.00	0.00	1062.23
1(c)	R.R.Schemes	1020.22		1020.22	0.00	0.00
	TOTAL KOLKATA	1432.18	411.96	1020.22	0.00	3615.61
2	PARADIP (*)	963.14	744.26	93.00	125.88	1449.79
3	VISAKHAPATNAM(*)	2287.91	2287.91	0.00	0.00	3365.60
4	ENNORE	1876.00	476.00	570.00	830.00	130.00
5.	CHENNAI (*)	3069.45	968.34	73.00	2028.11	2447.25
6.	TUTICIRIN	3032.7	1235.70	0.00	1797.00	3356.03
7.	COCHIN	347.00	97.00	210.00	40.00	1368.00
8.	NEW MANGALORE	691.17	361.17	330.00	0.00	990.76
9.	MORMUGAO	993.00	153.00	750.00	90.00	1917.30
10.	MUMBAI (*)	2024.81	2024.81	0.00	0.00	1700.52
11.	J.N.P.T.(*)	4215.05	2831.05	0.00	1384.00	17402.00
12.	KANDLA (*)	1824.98	1824.98	0.00	0.00	13293.70
	TOTAL(A)	22757.39	13416.18	3046.22	6294.99	51036.56
(B) OTHERS						
14.	DCI	1972.00	1972.00	0.00	0.00	0.00
15.	ALHW	904.75	0.00	904.75	0.00	0.00
16.	SCL	100.00	0.00	100.00	0.00	0.00
17.	Assistance for studies to State Govt. for Non-Major Ports	10.00	0.00	10.00	0.00	0.00
18.	IT for dept. of shipping	15.00	0.00	15.00	0.00	0.00
19.	Green Port Initiatives	220.00	0.00	220.00	0.00	0.00
20.	Dev. of Major Port in Maritime State	200.00	0.00	200.00	0.00	
19.	R&D Studies	7.50	0.00	7.50	0.00	0.00
20.	Web based PCS	5.00	0.00	5.00	0.00	0.00
21.	Survey Vessels	30.00	0.00	30.00	0.00	0.00
	TOTAL(B)	3464.25	1972.00	1492.25	0.00	0.00
	TOTAL (A + B)	26021.64	15388.18	4338.47	6294.99	51036.56

Note : (*) A provision of Rs 250.00 crore made under I.R. for IP Global Equity Contribution

17.2.1.5 On the basis of the discussions in the earlier chapters, the requirements of outlays for Major Ports and other organizations are estimated at the level of Rs. 22757.39 crore (including Rs 1500.00 crore for proposed IP Global to be met from Internal Resources of JNPT, MBPT, KPT, VPT, ChPT, PPT) and Rs. 3464.25 crores respectively.

Financing by Private Sector

17.2.1.6 The following Major Ports have proposed to get some of their projects financed through Private Sector to the extent of Rs. 51036.56 Crores.

Sl. No.	Name of the Port	Rs. in Crores
1.	KOLKATA	3615.61
2.	PARADIP	1449.79
3.	VISAKHAPATNAM	3365.60
4.	CHENNAI	2447.25
5.	TUTICORIN	3356.03
6.	COCHIN	1368.00
7.	NEW MANGALORE	990.76
8.	MORMUGAO	1917.30
9.	MUMBAI	1700.52
10.	J.N.P.T.	17402.00
11.	KANDLA	13293.70
12.	ENNORE	130.00
	TOTAL:	51036.56

Maritime States

17.2.1.7 Maritime states have drawn ambitious programmes to create additional capacity during 12th Plan. The states have identified projects for development of non-major ports at an estimated cost of Rs 1,06,832 crore for creation of additional capacity of 1039 million tonnes. Private sector is envisaged to fund most of the projects through PPP or BOT or BOOT basis. It is envisaged that private sector will meet 98.1% of the cost of development amounting to Rs 1,04,808 crore. Remaining requirement of Rs. 2024.68 crore is planned to be contributed by State Governments through Internal Resources / Gross budgetary Support/ Internal Extra budgetary Resources. State wise estimated cost of projects during 12th Plan along with sources of financing and capacity likely to be added is given as follow:

State wise Investment plans during XIIth Plan					
Maritime	Investment 2012-17	Source of funding (Rs. Crore)			
		IR	GBS	EBR	PPP
Gujarat	45,240.00				45,240.00
Maharashtra	18,218.00	690.00	--	1270.00	16258.00
Goa	64.68	64.68	--		
Karnataka	6,031.00				6031.00
Andhra Pradesh	15,200.00				15,200.00
Orissa	13,184.00				13,184.00
Tamilnadu	6,564.00				6,564.00
Kerala	1,368.00				1,368.00
Pondicherry	963.00				963.00
TOTAL	1,06,832.68	754.68		1,270.00	1,04,808.00

Source: Information received from GMB/AP/Goa and Annexure XII of Maritime Agenda 2010-20

17.2.2 Traffic Projections

The Major Ports' traffic projections for the terminal year of the 12th Plan (2016-17) is as follows:(In Million Tonnes)

Sl. No.	Commodity	Projected Traffic by 2016-17
1.	POL	259.42
2.	Iron Ore	112.00
3.	Coal	158.10
4.	Container - Tonnage <i>TEUs</i>	267.99 18.37
5.	Other Cargo	124.00
	GRAND TOTAL (1) TO (5):	943.06

The Non-Major Ports' traffic projections for the terminal year of the 12th Plan (2016-17) is as follows :

(In Million Tonnes)

Sl. No.	Commodity	Projected Traffic by 2016-17
1.	POL	230.40
2.	Iron Ore	78.00
3.	Coal	280.90
4.	Container - Tonnage <i>TEUs</i>	100.00 6.90
5.	Other Cargo	117.00
	GRAND TOTAL (1) TO (5):	815.20

17.2.3 Capacity Estimation

The overall capacity estimation by end of 12th Plan (2016-17) will be as follows

COMMODITY	(in Million Tonnes)		
	Major Ports	Non-major	Total
POL (incl.LNG)	299.66	299.9	599.56
IRON ORE (incl. Pellets)	143.55	101.4	244.95
FERT.& FRM	16.81	11.2	28.01
COAL (Coking & non-coking)	178.65	365.2	543.85
CONTAINERS	306.19	130.0	436.19
OTHERS	284.38	152.1	436.48
TOTAL	1229.24	1059.80*	2289.04

(*) While giving the details of the capacity addition through various development plans, the overall capacity indicated by non-major ports has been indicated at 1457.42 million tonnes . The break-up of the capacity addition during 12th plan period by each Maritime state is given in table 52, however commodity-wise break-up of the same is not available.

Table 52 : Statewise Capacity Addition During XIIth Plan (Million tonnes)						
State	Traffic during 2010-11	Capacity as on 31.3.2011	Assessed Capacity as on 31.3.2012	Projected Traffic in 2016-17	Capacity addition during 2012-17	Assessed Capacity as on 13.3.2017
Gujarat	230.91	283.64	324.40	385.30	376.60	701.00
Maharashtra	14.87	38.25	48.56	80.00	153.72	202.28
Goa	14.58	13.90	18.40	12.10	1.10	19.50
Karnataka	3.09	9.95	10.70	33.00	49.50	60.20
Andhra Pradesh	42.61	44.00	84.00	129.85	127.50	211.50
Tamil Nadu	1.61	1.20	3.10	29.20	32.10	35.20
Kerala	6.97	0.29	0.29	9.25	19.39	19.68
Orissa		23.00	27.00	114.50	141.16	168.16
Pondicherry		4.06	28.20	22.00	11.70	39.90
Total State Ports	314.64	418.29	544.65	815.20	912.77	1457.42

17.2.4 Traffic Projections, Capacity and Investment 2012-17

Summary of traffic projections, capacity and investments planned by major ports (excluding other organizations) and by maritime states in non-major ports is given as below:

Summary of Traffic Projections, Capacity and Investment								
	Traffic Projected (2016-17) (In million Tonnes)	Capacity (2016-17) In million Tonnes		Investment Planned (In Crore)				
		As on 31.03.12	As on 31.03.17	IR	GBS	EBR	PPP	TOTAL
Major Ports	943.06	702.80	1229.24	13416.18	3046.22	6294.99	51036.56	73793.95
Non Major Ports	815.20	544.65	1457.42	754.68		1270.00	104808.00	106832.68
TOTAL	1758.26	1247.45	2686.66	14170.86	3046.22	7564.99	155844.56	180626.63