പതിനാലാം കേരള നിയമസഭ
പതിനാറാം സമ്മേളനം

നക്ഷത്ര ചിഹ്നമിടാത്ത 04-11-2019 ൽ മറുപടിയ്ക്ക്

ചോദ്യം നമ്പർ : 2267

തീരദേശ കപ്പൽ ഗതാഗതം

ചോദ്യം		മറുപടി	
ശ്രീ.എ. പ്രദീപ് കുമാർ:		ശ്രീ. രാമചന്ദ്രൻ കടന്നപ്പള്ളി (ഉറമുഖവും മ്യൂസിയവും പുരാവസ്തു സംരക്ഷണവും വകുപ്പ മന്ത്രി)	
(എ)	സംസ്ഥാനത്ത് തീരദേശ കപ്പൽ ഗതാഗതം വികസിപ്പിക്കുന്നതിന് എന്തെങ്കിലും പദ്ധതികൾ ആവിഷ്കരിച്ചിട്ടുണ്ടോ ;	(എ) യും (ബി) യും	കണ്ടെയ്നർ കപ്പൽ സർവ്വീസ് ആരംഭിക്കുന്നതിന്റെ ഭാഗമായി കേരള മാരിടൈം ബോർഡിന്റെ നേതൃത്വത്തിൽ കൊല്ലം, അഴീക്കൽ ഉറമുഖങ്ങളിൽ ബിസിനസ് മീറ്റുകൾ സംഘടിപ്പിച്ചു നിലവിലുള്ള സർവ്വീസുകൾ നിലനിർത്തുന്നതിനും പുതിയ സർവ്വീസുകൾ ആരംഭിക്കാനും കേരള മാരിടൈം ബോർഡിന്റെ നേതൃത്വത്തിൽ ശ്രമങ്ങൾ നടത്തി വരികയാണ്. സംസ്ഥാനത്ത് തീരദേശകപ്പൽ ഗതാഗത പദ്ധതി പ്രകാരം കൊല്ലം, ബേപ്പൂർ, അഴീക്കൽ ഉറമുഖങ്ങളിൽ കണ്ടൈനർ ഹാൻഡ്ലിംഗ് ക്രെയിൻ, റീച്ച് സ്റ്റാക്കർ, വെയിംഗ് മെഷീൻ, ട്രക്ക് മൗണ്ടഡ് ക്രെയിൻ തുടങ്ങിയ അടിസ്ഥാന സൗകര്യങ്ങളെല്ലാം ഏർപ്പെടുത്തിയിട്ടുണ്ട്. ബേപ്പൂർ ഉറമുഖത്ത് 200 മീറ്റർ വാർഫിന്റെ നിർമ്മാണ പ്രവർത്തനം ആരംഭിക്കുന്നതിന് വിശദമായ പഠനറിപ്പോർട്ട് തയ്യാറാക്കുന്നതിന് ചെന്നൈ ഐ.ഐ.ടി യെ ചുമതലപ്പെടുത്തിയിട്ടുണ്ട്.
(ബി)	എങ്കിൽ വിശദാംശം വ്യക്തമാക്കുമോ ;		
(സി)	ഇതുമായി ബന്ധപ്പെട്ട് 'ഡിലോയിറ്റ്' നടത്തിയ പഠനം സംബന്ധിച്ച റിപ്പോർട്ടിന്റെ പകർപ്പ് ലഭ്യമാക്കാമോ ?	(സി)	ഡിലോയിറ്റ് സമർപ്പിച്ച പഠന റിപ്പോർട്ട് ഉള്ളടക്കം ചെയ്യുന്നു.

സെക്ഷൻ ഓഫീസർ

Deloitte.

(Private & Confidential)

Final report

Preparation of strategy road map cum action plan for development of coastal shipping in Kerala

June 2011

Submitted to

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Background

The state of Kerala has a coastline of 590 kms and has 17 inter-mediate and non-major ports besides Cochin port. To reduce the burden on the inland transportation and to benefit from the cost efficiency, there is a growing emphasis on using coastal shipping as a mode of transportation for moving domestic cargo as well as passengers across the states. Government of Kerala (GoK) intends to provide the necessary boost to coastal shipping with an aim to ease burden on inland transportation, particularly roads transportation and reduce the overall logistics cost. Accordingly, Directorate of Ports, Government of Kerala mandated Deloitte Touche Tohmatsu India Private Limited (Deloitte) to prepare an implementable strategy road map cum action plan for development of coastal shipping in Kerala.

Coastal commodities movement in Kerala

Coastal movement of cargo by sea in the country has grown at a CAGR of 3.3% during the period of 2001-10, while that overseas cargo movement has registered a CAGR of nearly 12% during the same period. In Kerala, the overseas movement of cargo has grown at a CAGR of 4.5% during the period of 2001-10, while coastal movement has grown at CAGR of 1.25% during the same period. Cochin port accounts for more than 99% of cargo traffic at ports in Kerala. In 2009-10, Cochin port handled around 17.42 million tonnes of cargo, with the coastal cargo accounting for 37% of the traffic. Some of the major coastal commodities handled at the ports of Kerala include POL, construction materials, cement, consumer goods, foods & spices. Presently the coastal cargo is being routed to Cochin port from where it is dispatched to its final destination in the state by road. By developing the other non-major ports in Kerala as coastal gateways, the coastal cargo can be offloaded at the nearest non-major port of the intended destination thereby reducing its logistics cost.

Potential coastal cargo movement

For developing suitable non-major port locations for catering to coastal movement, it is important to arrive at the potential cargo traffic that the port would cater to. The same can be assessed by analysing the future growth of the existing coastal commodities and the likely inter-modal shift of commodities from other modes to coastal movement.

To assess the inter-modal shift of cargo from other inland modes, a detailed traffic analysis was undertaken. Most of the goods transportation in Kerala takes place by road. Accordingly, diversion of cargo from road transportation to coastal mode has been analysed based on the total logistics cost of cargo movement from origin to destination and the time taken in transportation of cargo. With regards to the cargo carried by rail, it is noted that cargo is amenable for coastal movement. However the diversion from railways to coastal shipping has not been considered, since it was observed that a major chunk of rail freight traffic was handled for public sector undertakings which preferred rail for consideration of safety and reliability of transportation. Factors for consideration of the non-major ports location for catering to coastal cargo was based on the following –

- the location being a commercial activity center,
- inputs obtained during the interactions from stakeholders,
- cost economics of coastal movement,
- urban centre draw – able to attract number of people from surrounding towns who come for work daily
- coverage of entire state of Kerala with optimal number of ports

Accordingly the port locations of Azzhikal, Beypore, Kollam were selected to cater to the regions of Upper North Kerala, Central North Kerala and South Kerala respectively, apart from Cochin port to cater to the Central Kerala region. However, in the long run it would be in the interest of the State Government to develop a port, dedicated for coastal operations, in close vicinity of Cochin port. This port can also handle feeder operations for EXIM cargo at Cochin port. As the State Government already has plans for development of Alappuzha port, the same can be developed for coastal cargo.

Based on the traffic analysis elaborated in chapter 4, the following coastal traffic is envisaged to be distributed amongst the non-major ports of Azzhikal, Beypore and Kollam

In Million tonnes

Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Divertible	-	-	-	4.48	4.79	5.12	5.48	5.87	6.28	6.72
Existing	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.22	0.23	0.25
Total	0.14	0.15	0.16	4.64	4.97	5.32	5.69	6.09	6.51	6.97

Passenger movement

Coastal shipping can provide an alternative mode of transportation for following three categories of passenger movement:

I. Long distance (rail) passengers travelling to / from Kerala

II. Short distance (road) traffic between different pairs of Kerala's coastal districts

III. Tourist (cruise) traffic to Kerala

Using the coastal shipping for passenger transportation is a relatively expensive affair as compared to road and rail transportation. Further, people in India are not accustomed to water transportation, which further aggravates the situation. Therefore, the chances of passenger transportation by coastal shipping remain diminutive, particularly for long distance travel. Nevertheless, owing to potential time-savings in transportation by coastal shipping over road in Kerala, a fraction of short distance passengers travelling between coastal cities in Kerala is likely to shift to coastal ferries. Estimated number of passengers to opt for coastal shipping between select city pairs has been furnished in table below.

Short distance travel – Number of passengers shifting to coastal shipping

Origin-Destination pair	Likely passengers (per week)
Ernakulam - Kannur	2065
Kollam - Kannur	728
Thiruvananthapuram - Kannur	728
Ernakulam - Kozhikode	2065
Kollam - Kozhikode	2184
Thiruvananthapuram - Kozhikode	728
Kollam - Ernakulam	496
Thiruvananthapuram - Ernakulam	826
Total	9820

Economics of coastal movement

Coastal shipping has many advantages, such as better fuel efficiency, lower unit transportation cost, eco-friendly, free of congestion, etc. over competing modes of transportation such as road and rail. Given the cost-efficiency offered by coastal shipping and with the advent of River Sea vessels, the cost of transportation by coastal shipping, including charges for additional handling, would still be lower than the cost of transportation by road. This is evident from the transportation costs analysis in chapter 4 titled 'Traffic Forecast' wherein O-D costs of transportation by the inland modes (road and rail) and by coastal shipping were compared.

Distance in km		Road	Rail	Coastal
From	To		(Rs. Per MT per Km)	
1,800	More	1.7	1.27	0.67
1,200	1,800	1.9	1.27	0.75
1,000	1,200	2.1	1.36	0.82
800	1,000	2.2	1.47	0.86
400	800	2.3	1.55	0.90
250	400	2.5	1.70	0.98
150	250	2.7	1.97	1.06
100	150	3	2.24	1.18
50	100	3.5	2.81	1.37
20	50	3.5	4.49	1.37
0	20	3.5	12.37	1.37

Source: Deloitte analysis

Detailed analysis reveals that the difference in unit transportation cost would result in savings of Rs. 400-1400 per ton for movement by coastal shipping instead of road (considering cost of additional handling and need for inland movement by coastal shipping).
Owing to these advantages, there is possibility of cargo diversion from other modes to coastal shipping. However, this diversion is dependent on development of proper infrastructure along with regular and reliable shipping services at the ports.

Conclusions

Coastal shipping has not witnessed significant growth as compared to total seaborne trade in India. However, in coming year, coastal shipping is poised for fast growth. Specifically in Kerala, where roads are narrow and the land is densely populated, coastal shipping would prove to be a big respite. The government should, therefore, actively encourage and promote the use of coastal shipping. The critical needs in this regard are development of port related infrastructure and investments in ancillary facilities in the state. Additionally, proper incentive framework, vessel building subsidy for river-sea vessels and creation of awareness among the stakeholders would contribute to accelerated progress of coastal shipping in the state. The report concludes with a strategy road map and action plan (chapter 10) for fast paced growth of coastal shipping in the State of Kerala. The recommended action items are enlisted below:

High priority action items

- Arrange for automated containers handling equipments like forklift, cranes, stackers, weigh bridges at Azhikkal, Beypore, Kollam
- Construction of sheds / slots, godown, fuel and water supply, compound wall for containers / cargo at Azhikkal, Beypore, Kollam

- Strengthening of existing berth at Kollam
- Removal of shallow patches at Azhikkal
- Dredging at Beypore for 4 m. draft
- Construction of approach roads capable of handling container lorries at Azhikkal, Beypore, Kollam
- Development of container terminals at Azhikkal
- Strengthening of existing two berths and development of coastal passenger berth at Beypore
- Rationalize scale of rates for charges at non-major ports in the state duly provided with incentives
- Computerization of operational processes

Medium priority action items

- Development of passenger berth at Azhikkal
- Development of coastal passenger berth at Beypore
- Appoint dedicated professionals for promotion of coastal shipping in the State
- Identification and selection of logistics service providers for each of the port
- Arrangement for financing of river –sea vessels at concessional rates
- Elimination of customs intervention for coastal shipping operations
- Formulate a vessel building subsidy scheme for river-sea vessels
- Develop incentive framework for coastal movement of goods
- Increase awareness about coastal shipping through seminars / workshops / advertisement
- Formulation of state level coastal shipping policy
- Lobbying for national level coastal shipping policy
- Control on labour strikes in the State
- Abatement of service tax for coastal shipping
- Promotion of specialized courses in coastal shipping training

Low priority action items

- Exemption of income tax on crew manning coastal vessels
- Cargo support for government shipments
- Lobbying for grant of infrastructure industry benefits to coastal shipping
- Reduce the VAT on bunker from 12.5% to 0.5% for coastal vessels
- Development of coastal passenger berth at Kollam
- Dredging at Alappuzha for 4 m. draft
- Development of container cum passenger terminal at Alappuzha
- Deepening of berths to 10 m at Azhikkal, Beypore, Kollam
- Promotion of setting up ship repair unit at Kodungalloor / Munambam or Ponnani

1 Introduction

This chapter encapsulates the background information about the client, project and underlines the purpose, scope and structure of this project report.

1.1 About the report

Deloitte Touche Tohmatsu India Private Limited (DTTIPL) was mandated by the Directorate of Ports, Government of Kerala (DoP), for providing consultancy services for "Preparation of strategy road map cum action plan for coastal shipping in Kerala". This report constitutes the Final Report for the said assignment. The report analyses the scenario for coastal shipping in India and Kerala, along with addressing the issues hindering the development of coastal shipping.

1.2 Project genesis

The seaborne trade in India has been growing steadily. Given the fast pace of economic growth, expected to continue in coming years, the demand will increase manifolds. Approximately 95% of the country's EXIM trade by volume and 70% in terms of value is moved by sea. However, the maritime trade has been largely controlled by few ports, and has led to capacity saturation at these ports. The increased traffic volume has resulted in congestion and capacity constraints on road and rail transportation as well. To reduce the burden on the inland transportation and to benefit from the cost efficiency, there is a growing emphasis on using coastal shipping as a mode of transportation for moving domestic cargo as well as passengers across the states.

The Government of India has also identified coastal shipping as a focus area. To further develop the coastal shipping in a planned manner, the government is working on formulating a policy.

Kerala is one of the nine maritime states in India and Azhikkal port (a non-major port in Kerala) had been included as one of the non-major / minor ports by Government of India (GoI) under National Maritime Development Programme (NMDP) primarily for coastal shipping. The state of Kerala has a coastline of 590 kms. dotted with 17 inter-mediate and minor ports besides Kochi. A map showing key locations of the non-major ports in Kerala is shown in Figure 1-1.

Figure 1-1: Key minor ports locations in Kerala

Major EXIM cargo commodities in Kerala include tea, cashew kernels, sea food, coir products, spices, coffee, fertilizers, food grains, newsprint, cashew nuts etc. A major chunk of cargo is handled at Cochin port. While most of the cargo commodity movement from northern states to Kerala are transported mainly through roads / railways,

the logistics cost incurred presently (especially by using roads) is on the higher side due to the limitation in return cargo from Kerala resulting in the vehicle returning empty. Hence there is a need to explore coastal routes to facilitate reduction in logistics cost and increase cost competitiveness.

Of late, there have been efforts to transport some of commodities such as cement, tiles, etc. using coastal shipping. The volume of traffic through coastal shipping is expected to increase in future owing to reduced logistics cost for shippers and traders. Presently the coastal cargo is being routed to Cochin port, from where it is dispatched to its final destination in the state by road. By developing the other minor ports in Kerala as coastal gateways, the coastal cargo can be offloaded at the nearest port of the intended destination, thereby reducing its logistics cost. As non-major ports have a limitation in catering to EXIM cargo due to various inherent conditions including lack of draft to cater to foreign going vessels, such limitation would not be the case for coastal shipping. Therefore, it becomes a win-win situation for both the ports authorities and the users of coastal shipping.

Apart from cargo, a significant number of passengers also travel to other port locations such as Lakshadweep by water transportation. Number of such passengers is only expected to increase in coming years.

Considering these aspects, the Government of Kerala (GoK) intends to provide the necessary boost to coastal shipping with an aim to ease burden on inland transportation, particularly roads transportation and reduce the overall logistics cost.

In addition, there is also a need to develop necessary infrastructure facilities and linkages to the state ports to support and promote the coastal shipping in the state. To achieve this, the Government of Kerala has designated the Directorate of Ports (DoP) with the responsibility of developing an implementable strategic road map to for development of coastal shipping in the state.

1.3 Objectives of the assignment

The key objective of the assignment was to *prepare an implementable strategy road map cum action plan for development of coastal shipping in Kerala*. The underlying goals included:

- To understand and review the scenario of coastal shipping in India and in Kerala
- To analyse the opportunities landscape for coastal shipping in Kerala
- To develop a strategic road map cum action plan for development of coastal shipping in Kerala

To achieve these objectives, the following key tasks have been performed during the course of the assignment.

- To understand and review the coastal shipping scenario in India and Kerala
- To study and analyse the current cargo and passenger traffic movement in the hinterland
- To assess the possibility and quantum of modal shift to coastal shipping for the cargo and passenger traffic (on selected routes)
- To identify possibilities of integrating coastal shipping with Inland Waterways Transportation (IWT)
- To estimate future traffic potential (Cargo and Passengers) for coastal movement in Kerala for next ten years
- To identify and assess suitability of non-major ports in the State for coastal shipping

- To develop a strategy road –map and action plan for development of coastal shipping in Kerala

1.4 Project scope

The scope of work for the assignment was divided into 3 parts as explained below:

Part I: As-Is Scenario of Coastal shipping in India and in Kerala

This included developing a deeper understanding on coastal shipping in India and Kerala and covered following aspects:

- Regulatory framework for coastal shipping in India
- Review of coastal traffic (cargo and passengers) during past few years in India and Kerala
- Profile of coastal fleet in India
- Advantages of coastal shipping
- Issues concerning coastal shipping
- Infrastructure supply for coastal shipping in Kerala
- Profiling the current and potential cargo and passengers movement in Kerala having relevance for coastal shipping
- Analysis of current trends in the coastal shipping

Part II: Opportunity analysis in coastal shipping

This part included review and analysis of opportunities landscape for coastal shipping in Kerala and covered following aspects:

- Identifying cargo (and passenger) traffic that can be diverted / attracted to coastal shipping from other modes of transport such as road / rail and steps needed to achieve such a diversion
- Examine the demand side and supply side for coastal shipments along the coastline that can be routed through the ports in Kerala
- Identifying the nature and volume of cargo with their origins and destinations including availability of return cargo
- Identifying the major O-D pairs (of relevance to coastal shipping in Kerala) for passenger transportation and assessing the passenger traffic volumes for coastal shipping
- Study the availability of coastal routes and explore the possibility of developing new ones to meet existing and potential demand
- Estimating future traffic potential for coastal movement in Kerala next ten years

Part III: Develop strategy road map cum action plan

This part included developing a strategy road map cum action plan for development of coastal shipping in Kerala. The strategy road map cum action plan covered following:

- **Operational aspects**
  - Identifying non-major ports in Kerala (either existing or yet to be established) for coastal shipping
  - Review of business environment
  - Analysis of non-major ports, including existing infrastructure and road / rail connectivity, hinterland linkages for purpose of coastal shipping

- Examining the possibility of establishing an integrated transport system between coastal shipping and Inland Water Transport

- **Financial aspects**
  - Provide broad cost estimates
  - Identify the sources for funding
- **Strategy road map cum action plan**
  - Recommendations on type and development of coastal shipping infrastructure that is required
  - Policy initiatives that the Government needs to take to encourage coastal shipping
  - Tax and other financial incentives that the Government can provide to coastal shipping stakeholders

The part III concluded with an action plan on the strategy roadmap cum action plan that the Directorate of Ports, Government of Kerala needs to adopt in order to develop non-major ports in Kerala suitably for coastal shipping.

1.5 Structure of report

In the course of preparing this report, DTTIPL has ensured that specific requirements as outlined in the scope have been addressed appropriately. The report is organized under separate chapters as mentioned in Table 1-1.

Table 1-1: Chapters of the report

#	Chapter Title	Topics Covered
1	Introduction	Project background, rationale, & report structure
2	Cargo traffic	Analyses coastal cargo traffic in India and Kerala
3	Commodity profile	Discusses the various commodities being moved in and out of Kerala while underlining the preferred mode of transportation
4	Traffic forecast	Identifies the traffic that can be diverted to coastal shipping by advent of proper measures
5	Passenger traffic	Identifies possible options for passenger transportation by coastal shipping and commercial viability of such options
6	Infrastructure	Profiles availability and requirement of infrastructure at identified port locations
7	Coastal fleet	Provides an overview of coastal fleet in India
8	IWT and its integration	Explores the possibility of integration of inland waterways with coastal shipping in Kerala
9	Economics of coastal movements	Covers advantages of coastal movements, underscores the need for coastal shipping in Kerala and suggests why coastal shipping is poised for growth.
10	Strategy road-map cum action plan	Analyses the issues plaguing the development of coastal shipping and suggests strategic roadmap cum action plan needed to be adopted by the Government of Kerala

1.6 Caveats

1.6.1 Data, information and projections

DTTIPL has, for the purposes of providing the Service, used information and data furnished by other sources if DTTIPL in good faith believed such information and data to be reliable. However, DTTIPL shall not be responsible for, and DTTIPL shall provide no assurance regarding, the accuracy and/or comprehensiveness of any such information or data.

DTTIPL does not accept any responsibility or liability for the projections or any losses that may be incurred by the client or any party as a result of reliance on the projections. We do not provide any assurance about the achievability of the projections.

1.6.2 Reports and communication are for the sole use of the client

All communications, reports and information provided by the DTTIPL to the client, its employees or agents, whether in writing or oral is provided solely for the use of the Client in connection with the services specified herein, and shall not be used for any other purpose or referred to in any document or made available to any other person. This report and the information are absolutely confidential and any reproduction, copying or otherwise, quoting of the report or any part thereof can be done only with prior permission in writing of the DTTIPL. The report is intended only for the sole use and information of Client, for the purpose set out earlier in this agreement. No other party is entitled to rely on the DTTIPL' reports or advice for any purpose whatsoever. DTTIPL disclaims any responsibility to any third party for any decision taken based on this report.

1.6.3 Decision by the Client

The Client understands and agrees that written advice and final reports shall take precedence over any advice and interim report. DTTIPL will not be responsible for updating any opinions, advice or reports subsequent to the issue of the final version.

The Client understands and agrees that the Services hereunder includes advice and recommendations, but all decisions in connection with the implementation of such advice and recommendations shall be the responsibility of, and made by, the Client. The Client shall be solely responsible for, among other things, making all management decisions and performing all management functions.

2 Cargo traffic

This chapter provides details on the present scenario for cargo movements by shipping in India and Kerala. A detailed secondary research was conducted for collection of data from authentic and reliable sources. The data on cargo movements and its growth in India and Kerala were analysed to understand the trends in shipping sector. The findings are organized as per below mentioned sections:

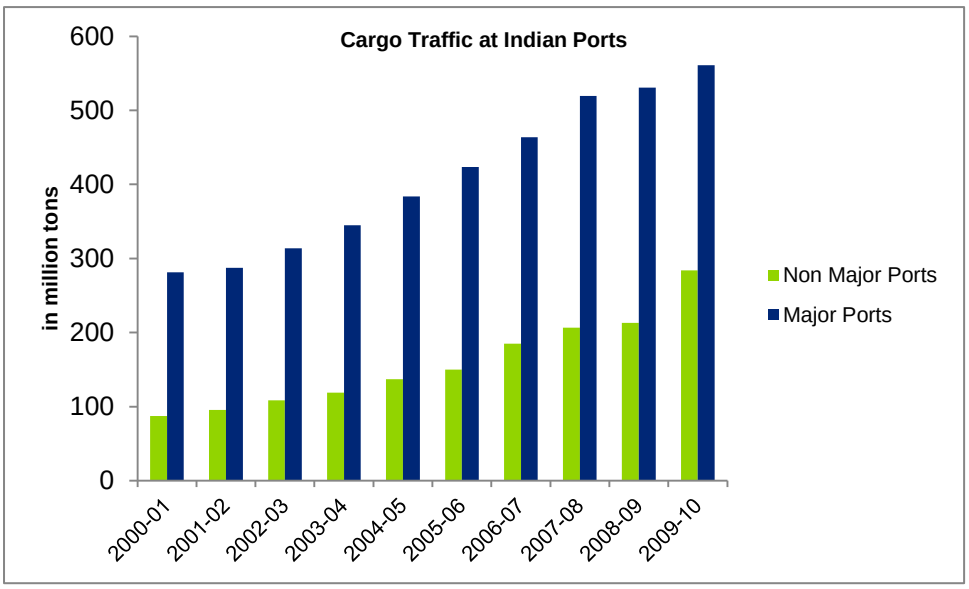
i. Cargo traffic in India
ii. Coastal cargo distribution
iii. Cargo traffic in Kerala
iv. Cargo distribution in Kerala

2.1 Cargo traffic in India

2.1.1 Cargo traffic at major and non-major ports

Cargo traffic at ports in India reached 844.90 million tons in year 2009-10. Figure 2-1 shows the traffic pattern at major and non-major ports in India for the past decade.

Figure 2-1: Cargo traffic at Indian ports



Source: Ministry of Shipping / Indian Ports Association

The total cargo traffic handled at the Indian ports over the ten years period from 2000-01 to 2009-10 has more than doubled. The cargo traffic CAGR during the period from 2000-01 to 2009-10 has been furnished in Table 2-1.

Table 2-1: Cargo traffic CAGR

Category	CAGR (2001-10)
Major Ports	7.98%
Non Major Ports	13.99%
Total	9.66%

Source: Deloitte analysis

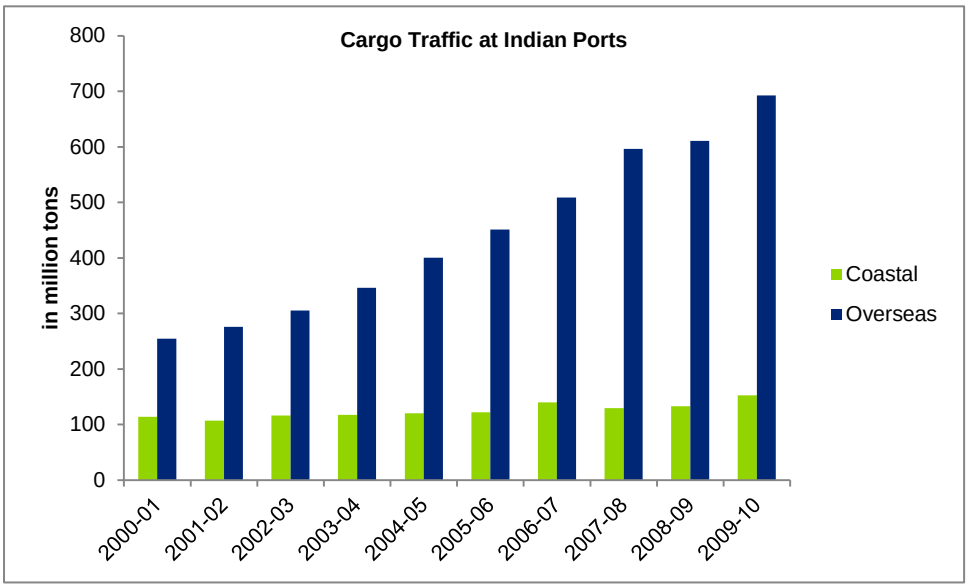
Major ports in India have enjoyed a dominant position in terms of handling cargo traffic for many years, handling more than 90% of total cargo until year 1994. However, due to capacity constraints

and congestion issues being faced at many of the major ports, the cargo traffic has witnessed significantly higher growth at non major ports. Another contributing factor to this growth is the efforts of maritime state government agencies to promote non-major ports in their states by adopting PPP model for development of non-major ports. Most of the ports with private sector participation viz. Mundra, Pipavav, Gangavaram, Krishnapatnam, Karaikkal, etc. are equipped with superior infrastructure and modern handling facilities, and hence have been growing fast. As a result, the share of non-major ports in cargo traffic has grown to more than 33% in year 2009-10 from 23% in the year 2000-01. The state of Gujarat in particular has been most dynamic and pro-active in attracting private sector participation for ports development. This is reflected with the state having more than 70% share of traffic at the non-major ports of the country.

2.1.2 Coastal and overseas cargo

The coastal and overseas cargo traffic is estimated to be 152.5 million tons and 692.4 million tons respectively in year 2009-10. Figure 2-2 shows the growth of coastal and overseas cargo at Indian ports.

Figure 2-2: Coastal and overseas cargo traffic



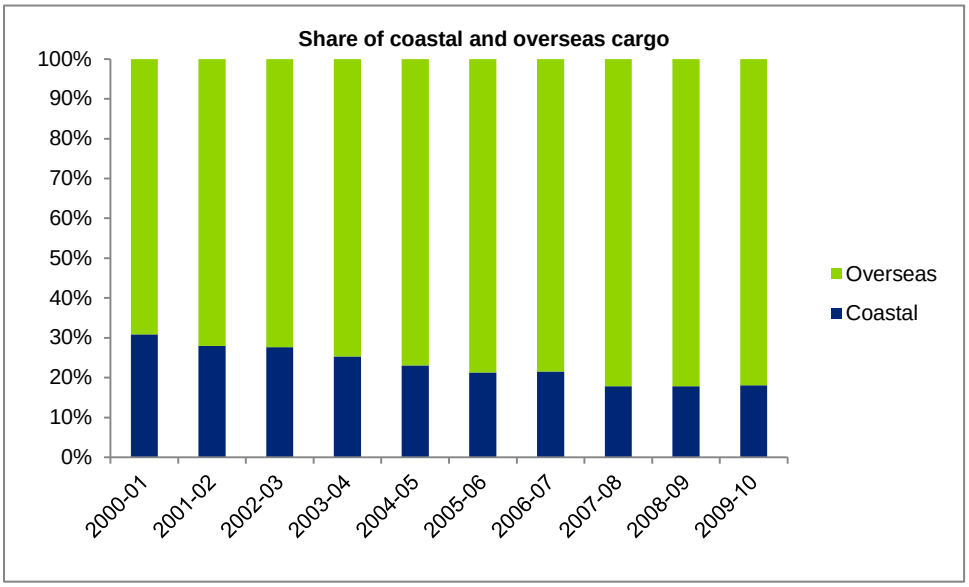
Source: Ministry of Shipping / Indian Ports Association

It should be noted that the coastal cargo figure quoted above includes cargo which is loaded as well as unloaded. Therefore, the originating (loaded) coastal cargo traffic should be half of the total, i.e. 76.25 million tons.

While the overseas cargo has registered a CAGR of nearly 12%, the coastal cargo has grown at CAGR of merely 3.3% during the period 2000-01 to 2009-10. Over the years, the share of overseas cargo has increased to 82% in 2009-10 from 69% in 2000-01 whereas the share of coastal cargo has decreased in total cargo traffic.

Figure 2-3 shows the composition of coastal and overseas cargo traffic in India.

Figure 2-3: Share of coastal and overseas cargo



Source: Ministry of Shipping / Indian Ports Association

2.2 Coastal cargo distribution

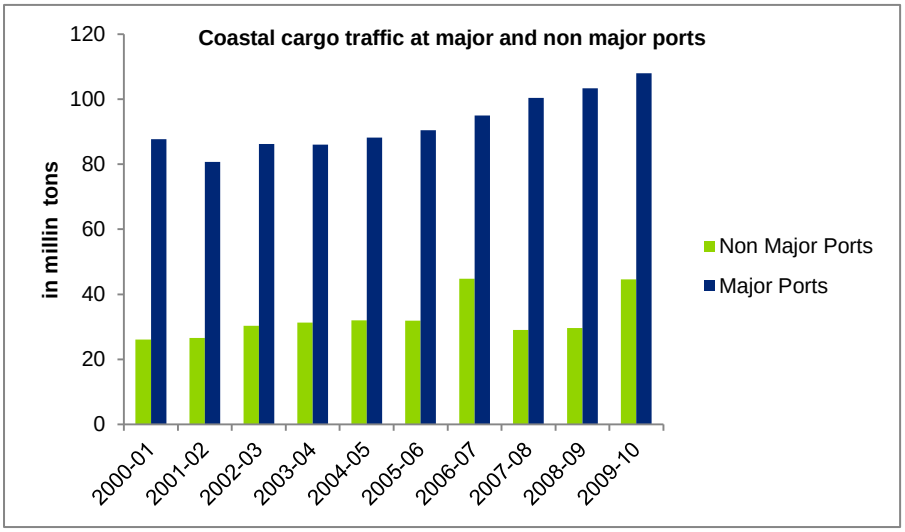
2.2.1 Port-type wise

Figure 2-4 shows the coastal cargo growth at major and non-major ports in India. The cargo at major ports shows a CAGR of 2.33% whereas at non-major ports it has a CAGR of 6.15%. This trend of higher growth of coastal cargo at non-major ports is likely to continue for the following reasons:

i. Major ports are already facing capacity constraints and hence catering to coastal cargo becomes bit more difficult

ii. Non-major ports offer more incentives and competitive tariffs to attract cargo traffic, especially coastal cargo

Figure 2-4: Coastal cargo traffic at major and non-major ports

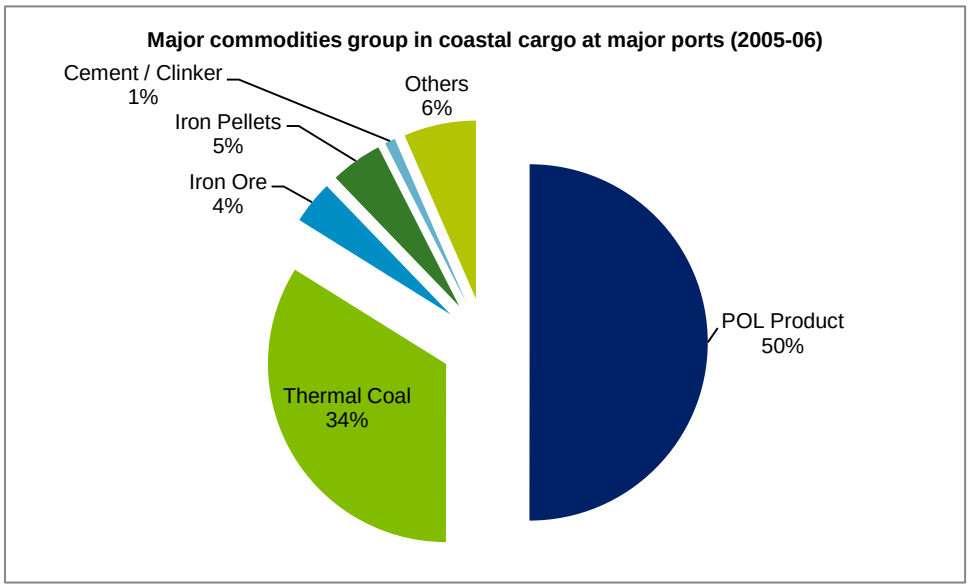


Source: Ministry of Shipping / Indian Ports Association

2.2.2 Commodity wise distribution

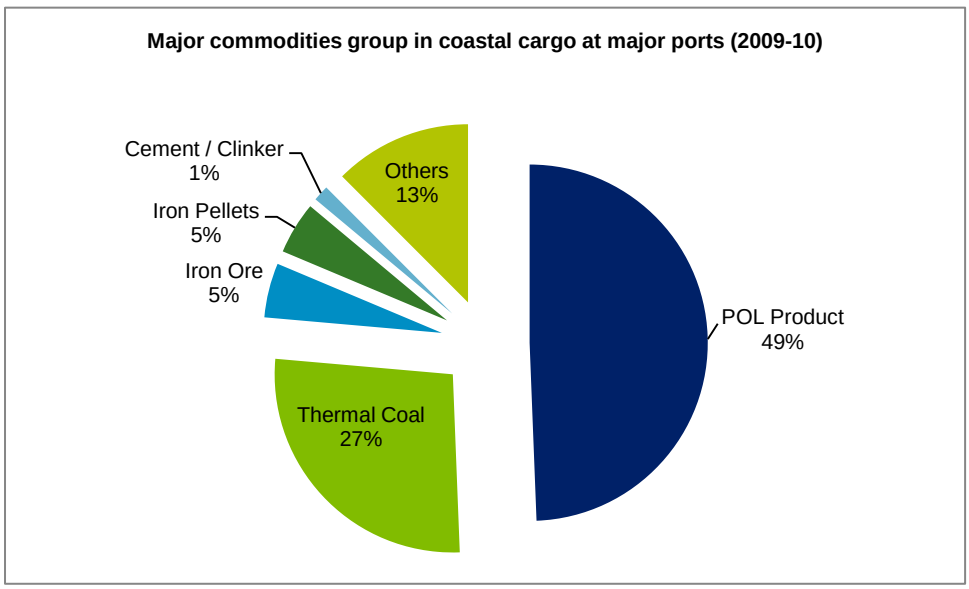
Commodity wise distribution of coastal cargo at major ports in India in year 2005-06 and 2009-10 is represented separately in Figure 2-5 and Figure 2-6. The POL group (liquid bulk) has the highest share followed by thermal coal (dry bulk) in coastal cargo. Other major commodities include cement / clinker, iron ore, iron pellets in dry bulk and containerised general cargo.

Figure 2-5: Major commodities group in coastal cargo at major ports 2005-06



Source: Indian Ports Association

Figure 2-6: Major commodities group in coastal cargo at major ports 2009-10



Source: Indian Ports Association

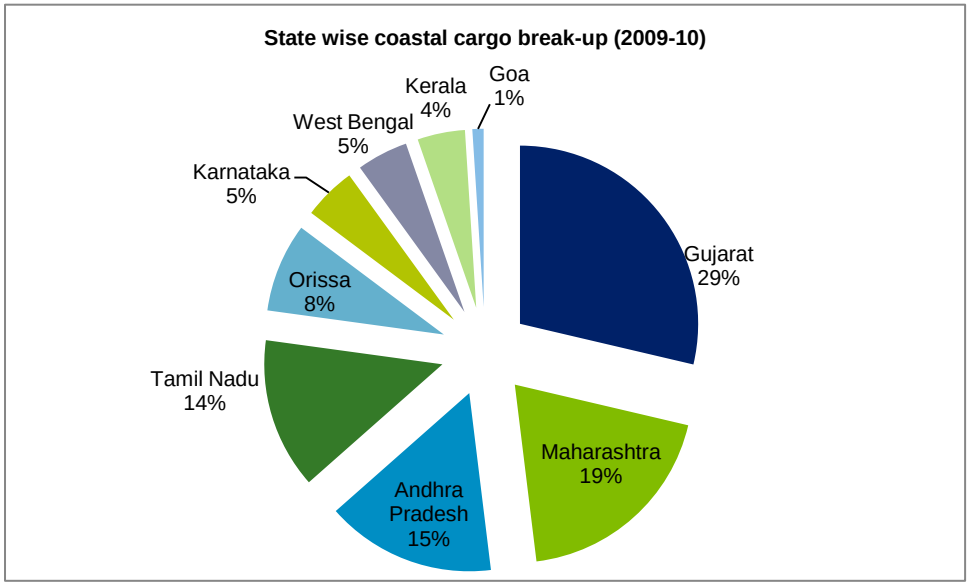
It can be seen from the above two charts, that the coastal cargo pattern being handled at the Indian ports is undergoing a change. The share of bulk cargo (liquid, dry and break) commodities such as POL, Coal, Iron and Cement has come down from 94% in 2005-06 to 87% in 2009-10. On the other hand the share of 'Others'%, which includes container traffic, has seen dramatic increase from 6% to 13. This is on account of increasing containerization of goods, due to buyers / manufacturers

preferring smaller but optimum quantities to reduce the inventory carrying cost of their raw materials, a trend which is expected to continue in future.

2.2.3 State wise distribution

State wise distribution of coastal cargo in represented in Figure 2-7.

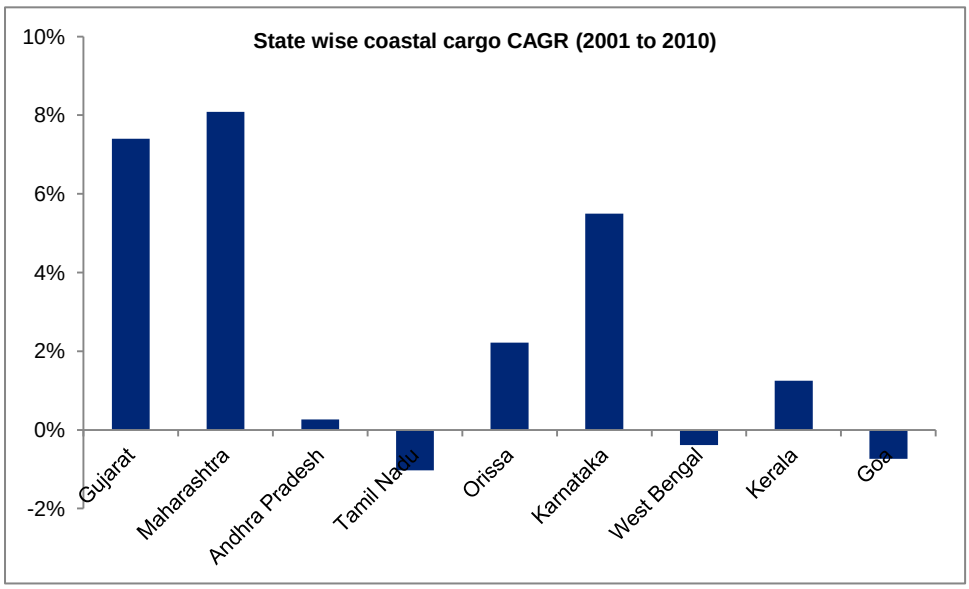
Figure 2-7: State wise coastal cargo break-up (2009-10)



Source: Ministry of Shipping

The states of Gujarat and Maharashtra on the west coast together account for almost half of the coastal cargo traffic in the country. Further, the four states namely, Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu, clubbed together have more than 75% share of coastal cargo. Significant chunk of the coastal cargo handled in the states of Tamil Nadu, Andhra Pradesh and West Bengal comprise of bulk cargo. The state of Kerala ranks second last with a 4% share in coastal cargo traffic. The CAGR for coastal cargo has been depicted in Figure 2-8.

Figure 2-8: State wise coastal cargo CAGR



Source: Ministry of Shipping

The states of Gujarat and Maharashtra leads in growth of coastal cargo traffic at ports. However, there has been a decline in cargo traffic in the states of Tamil Nadu, West Bengal and Goa.

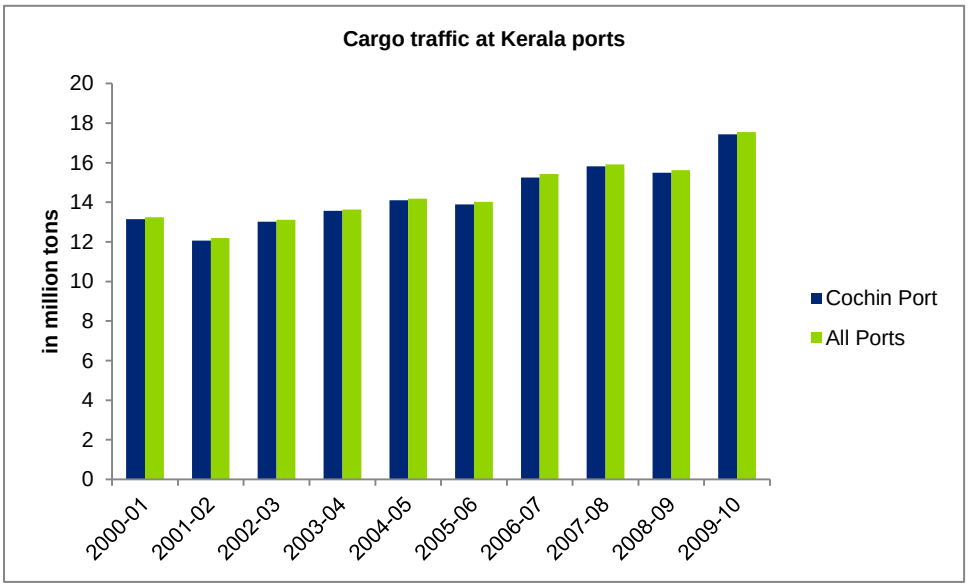
The states of Gujarat and Maharashtra have been forerunners in creation of infrastructure and creating conducive environment for business and attracting investments. It can be deduced that the maritime states with developed infrastructure and environment conducive to business, are likely to have larger share in cargo traffic with high pace of growth. These states are also bestowed with a thriving industrial hinterland and with the implementation of the Delhi-Mumbai Industrial corridor by the next decade; the maritime environment in the two states will remain bullish.

2.3 Cargo traffic in Kerala

2.3.1 Cargo volume in Kerala

In addition to the state controlled ports, Cochin port, which is a major port, is also located in Kerala. Cargo traffic at Cochin and all the ports in Kerala is shown in Figure 2-9. It can be noted that the Cochin port continues to account for more than 99% of cargo traffic at ports in Kerala and non-major ports handle negligible cargo traffic in the state. The overall cargo traffic in the state has registered a CAGR of 3.18% during the period 2000-01 to 2009-10.

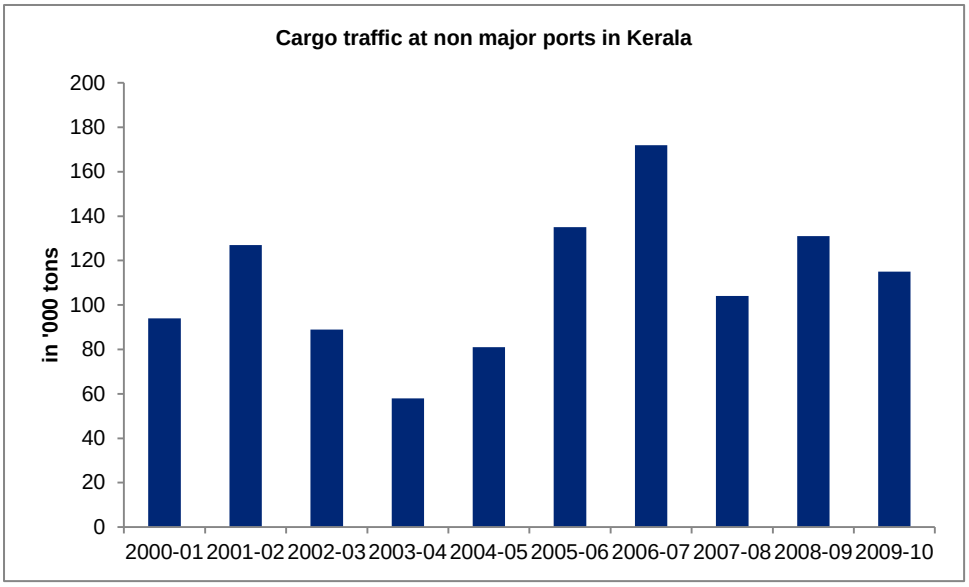
Figure 2-9: Cargo traffic at Kerala ports



Source: Ministry of Shipping / Indian Ports Association

Traffic at the non-major ports in Kerala stood at 115,000 tons in year 2009-10. The growth of traffic over the years is shown in Figure 2-10. The state has witnessed ups and down in the cargo traffic over the years. The cargo traffic at non-major ports in Kerala has registered a CAGR of merely 2.27% during the period 2000-01 to 2009-10. As compared to the country, Kerala has lagged behind in development of state controlled ports, which have registered a CAGR of 13.99% during the same period.

Figure 2-10: Cargo traffic at non-major ports in Kerala



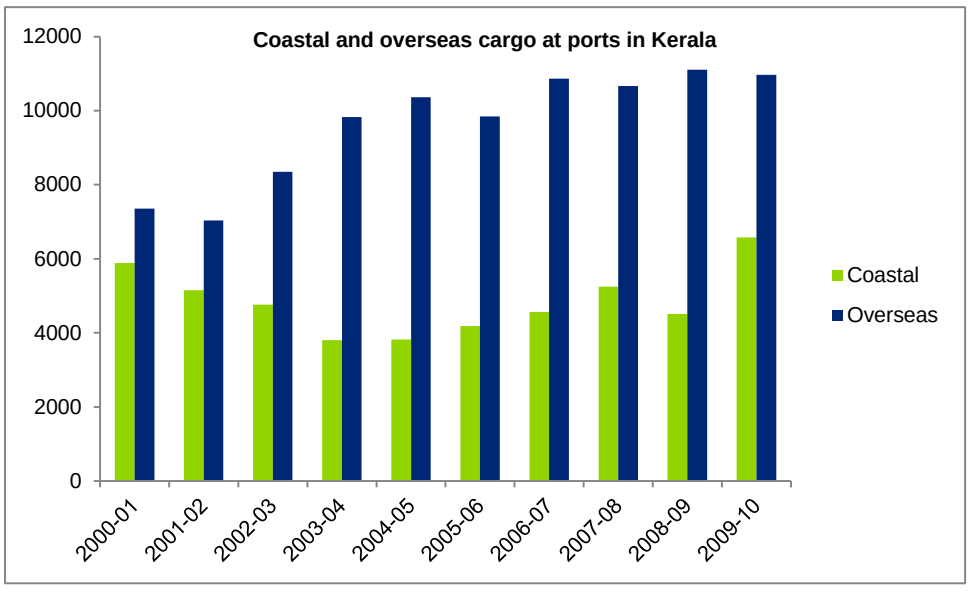
Source: Ministry of Shipping / Indian Ports Association

2.4 Cargo distribution in Kerala

2.4.1 Coastal and overseas cargo traffic in Kerala

Figure 2-11 shows the growth of coastal and overseas cargo traffic at the ports in Kerala. The share of coastal cargo at ports in Kerala has come down to around 37% in 2009-10 from almost 45% in 2000-01.

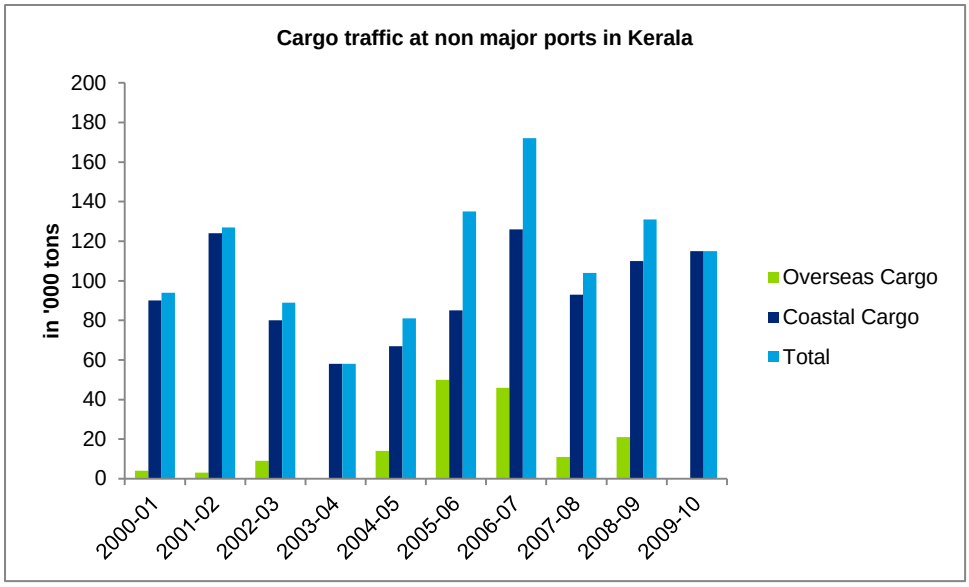
Figure 2-11: Coastal and overseas cargo at Kerala ports



Source: Ministry of Shipping / Indian Ports Association

Coastal cargo accounts for around 37% of cargo traffic at Cochin port and more than 80% at non major ports in Kerala, which mainly handle the coastal cargo traffic. Coastal cargo traffic in Kerala has registered a CAGR of 1.25% during the period 2000-01 to 2009-10, whereas the same for overseas cargo is 4.5%. Figure 2-12 shows the cargo traffic at non major ports in Kerala.

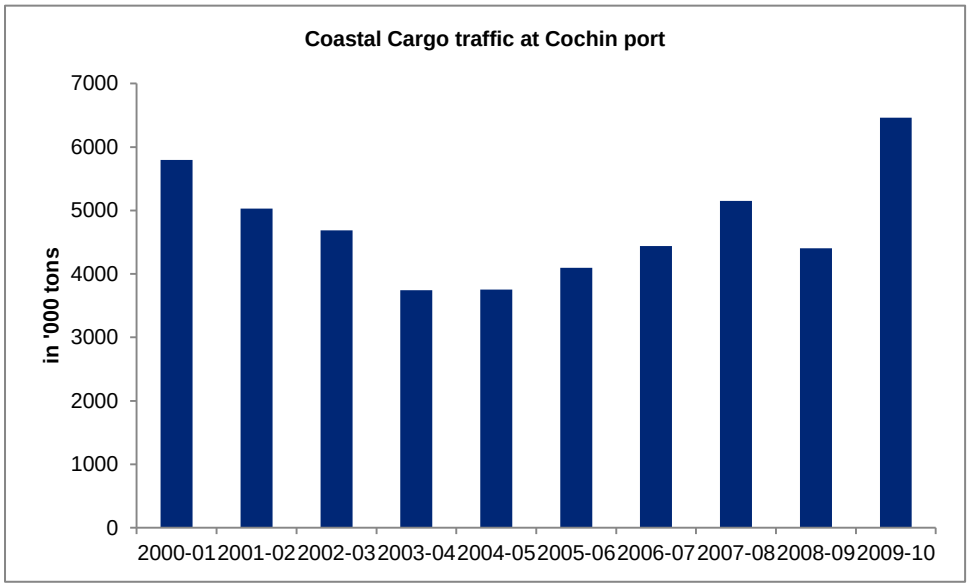
Figure 2-12: Cargo traffic at non major ports in Kerala



Source: Ministry of Shipping / Indian Ports Association

Non-major ports in Kerala continue to handle mainly the coastal cargo. The coastal cargo at non major ports in Kerala has registered a CAGR of 2.76% during the period 2000-01 to 2009-10. Similarly the coastal cargo growth handled at Cochin Port is also not very encouraging. Figure 2-13 shows the coastal cargo traffic at Cochin port which has grown at CAGR of 1.22% during the period 2000-01 to 2009-10.

Figure 2-13: Coastal Cargo traffic at Cochin port

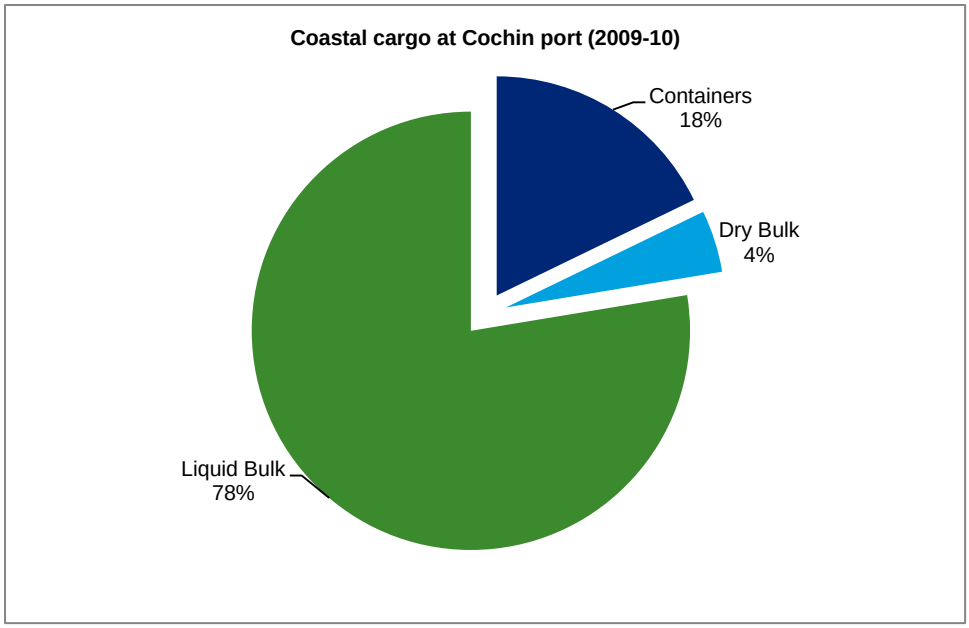


Source: Ministry of Shipping / Indian Ports Association

2.4.2 Commodity distribution

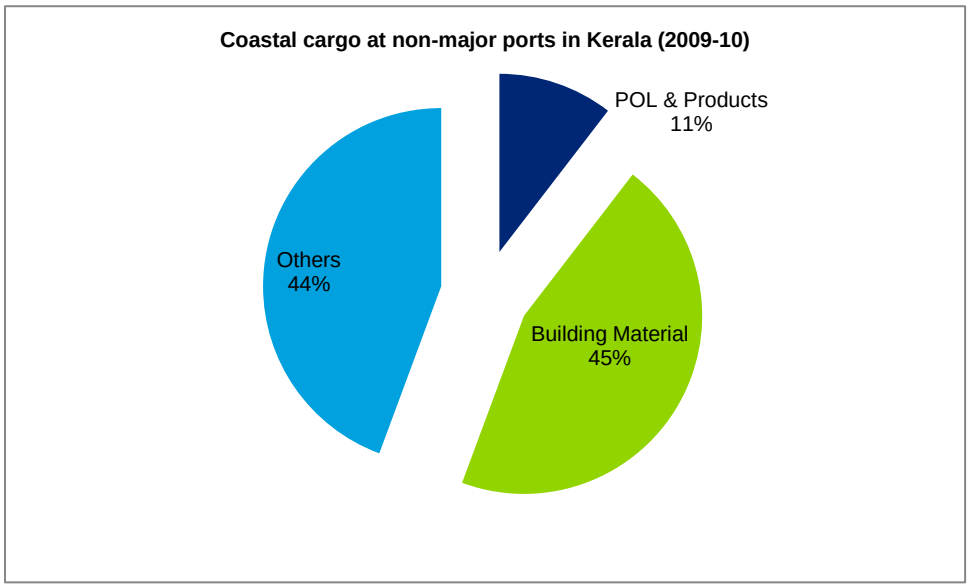
The type wise distribution of coastal cargo at Cochin port and non-major ports in Kerala is shown in Figure 2-14 and Figure 2-15. While POL and other liquid bulk constitutes major chunk of cargo at Cochin port, building materials account for larger chunk at non-major ports.

Figure 2-14: Coastal cargo at Cochin port



Source: Cochin Port Trust

Figure 2-15: Coastal cargo at non-major ports



Source: Indian Ports Association

Others mainly include tiles, marbles, granites, soda ash, wheat, rubber & its products, plywood amongst others. Commodities included in coastal cargo are covered in the following chapter titled 'Commodity Profile'.

3 Commodity profile

Kerala is pre-dominantly a service economy. More than 75% of Net State Domestic Product (NSDP) for the State comes from tertiary sector. Kerala being a consumer state is dependent on imports for meeting most of its requirements for all the commodities. These commodities are being moved mainly by roads from other states. Owing to cost economics, some of the commodities have started getting transported by coastal shipping. Railways maintain their dominance in transportation of some of the commodities such as fertilizers, food-grains (which remain under the purview of the Central Government).

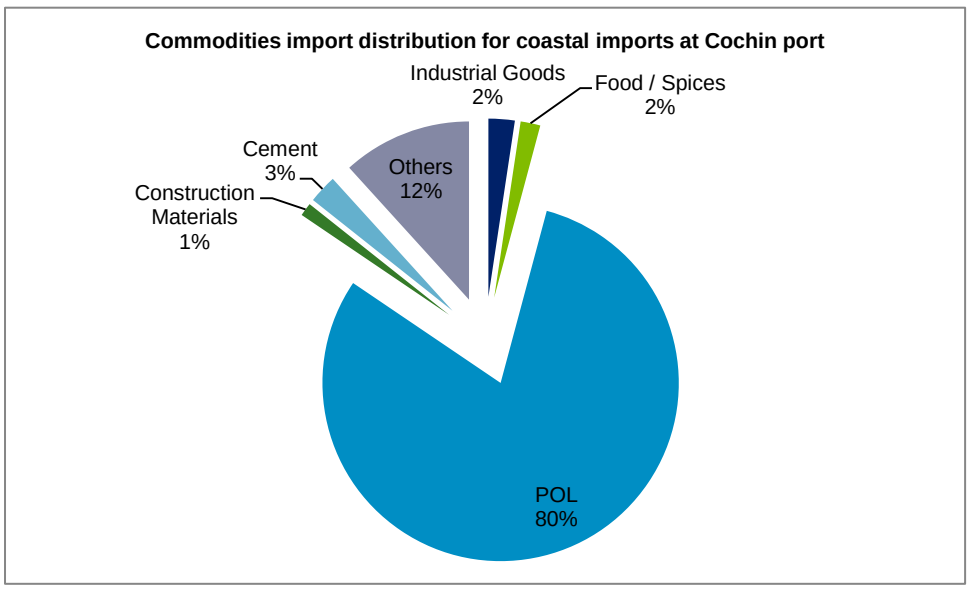
This chapter provides details of the commodities that are being moved in and out of Kerala by different modes. In doing so, the consultants have analysed the potential for goods that can move by coastal shipping. The data and information presented is based on primary interactions with the stakeholders and supplemented with secondary research. The findings are organized under following headings:

i. Existing coastal imports
ii. Existing coastal exports
iii. Coastal movements of commodities
iv. Movements of commodities by other modes

3.1 Existing coastal imports

Currently, shipping companies on west coast are providing coastal shipping services between the ports in Gujarat and Kerala. Coastal cargo in Gujarat is mainly loaded at Kandla and Mundra ports and to a certain extent at Pipavav port. Apart from Gujarat ports, coastal cargo imports in Kerala also get loaded at Mumbai, Mormugao, New Mangalore, Tuticorin and Chennai ports. In Kerala, the operations are concentrated at Cochin port, accounting for almost 98% of coastal cargo traffic in Kerala.

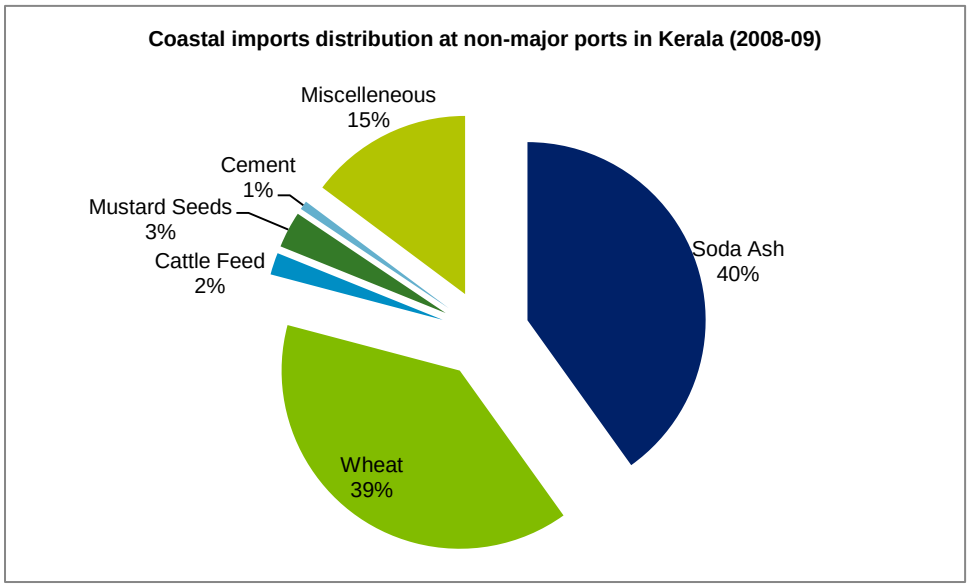
Figure 3-1: Coastal import distribution at Cochin port 2009-10



Source: Cochin Port Trust

The Figure 3-1 shows the break-up of commodities imported by coastal shipping at Cochin port in year 2009-10. The Figure 3-2 shows the distribution of coastal imports at non-major ports in Kerala. As noted above, the non-major ports handle negligible coastal cargo as compared to Cochin port. Therefore, while we include cargo at non-major ports in our analysis, we focus primarily on commodities being imported at Cochin port. Amongst the non-major ports, Beypore port accounts for more than 90% of cargo traffic in Kerala. Each of the commodity groups are analysed further in following sections.

Figure 3-2: Coastal imports distribution at non-major ports in Kerala 2008-09

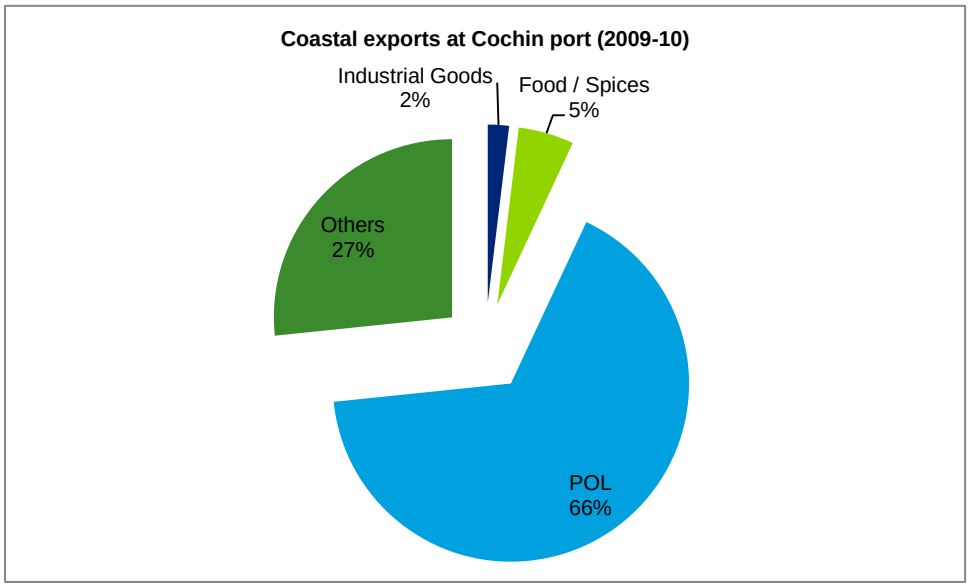


Source: Kerala Economic Review 2009

3.2 Existing coastal exports

Coastal exports at ports in Kerala are much lower than the coastal imports. Figure 3-3 shows the composition of coastal export commodities at Cochin port.

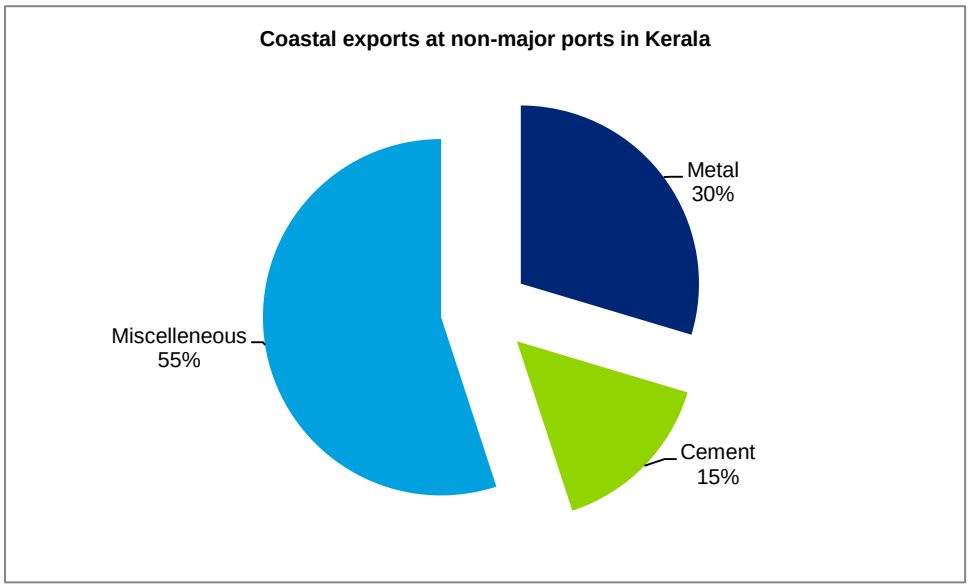
Figure 3-3: Coastal exports at Cochin port (2009-10)



Source: Cochin Port Trust

Figure 3-4 represents composition of coastal exports at non-major ports in Kerala.

Figure 3-4: Coastal exports at non-major ports in Kerala (2008-09)



Source: Kerala Economic Review 2009

Most of the cargo from ports in Kerala, particularly Beypore, is exported to Lakshadweep which is a group of islands having no major production base and depends for all its requirements to be met from mainland. Kerala being the nearest mainland, almost all the goods are transported from ports in Kerala. However, some of the cargo from Kerala ports also gets moved to ports in Gujarat. In the following section we discuss the coastal export cargo from Kerala.

3.3 Coastal movements of commodities

3.3.1 Petroleum, Oil and Lubricants (POL)

POL products group includes crude, LPG and POL products such as furnace oil, motor spirit and naphtha. These products are both imported and exported at ports in Kerala.

3.3.1.1 Imports

While there are large movements of many commodities, POL still accounts for 80% of coastal imports. A significantly large quantum of POL products are being moved from Mumbai port. New Mangalore, Chennai, Mormugao and Tuticorin ports have some volumes for POL cargo movement towards Cochin.

Kerala has only one refinery namely Kochi Refinery Limited (part of Bharat Petroleum Corporation Limited) located at Ambalamugal in Cochin district. This is a major shipper for POL products, which mainly imports crude from Mumbai via coastal shipping. Apart from Kochi Refinery, IOCL and HPCL have their depots in Kerala for which they move cargo from their refineries in Gujarat and Mumbai to Cochin port. These imports are then taken by rail or road to depots for further distribution. Apart from Cochin, very small volumes of POL cargo have also been noted at Beypore port.

3.3.1.2 Exports

Export of POL products includes coastal movement to Lakshadweep as well as other ports. BPCL does not have any facility on the east coast and moves its products from Kochi Refinery via coastal shipping ports at Chennai, Kakinada, Haldia and Kolkata for distribution in their respective hinterland.

3.3.2 Construction materials

Construction materials being moved includes mainly marble, granite and tiles. These are containerized cargo with a TEU weighing around 28 tons. Apart from these products, sand is also moved depending upon its price. Cement has been considered separately.

3.3.2.1 Marble / Granite / Tiles

Marble, granite and tiles account for a major part of containerized cargo being moved to Kerala. Marble and granite cargo originate from Rajasthan and is loaded at a port in Gujarat, mainly Kandla and Mundra port. Tiles come from Morbi and are loaded at Gujarat port. These are transported to Kerala through Cochin port.

3.3.2.2 Sand

As sand-mining is banned in Kerala, sand is imported for construction activities. Sand is moved through the coastal mode from Gujarat to Kerala. Sand is imported mainly at Cochin and Kollam port.

3.3.3 Cement

The demand of cement exceeds its supply in Kerala. Therefore, cement is shipped by cement plants in Gujarat to Kerala. The major cement companies engaged in coastal movement include Ambuja Cement, Saurashtra Cement, Ultra Tech and Digvijay Cement. Cement is mainly moved to Cochin port, with some of the cargo also being unloaded at Beypore port. Majority of cement shipments take place during October to March period.

3.3.4 Consumer Goods

Consumer goods include items such as electrical appliances, furniture etc. Most of the consumer goods originate from Delhi and National Capital Region (NCR). However, the volume of these goods in coastal transportation is negligible.

3.3.5 Industrial Goods

3.3.5.1 Imports

Industrial Goods being imported mainly comprise of following items:

- Heavy melting scrap
- Chemicals
- Machinery
- Newsprint
- Metals (Iron & Steel + Sp. Iron)
- Soda Ash
- Zinc Concentrate
- Bauxite
- Sodium Bi Carbonate
- Slag
- Phosphoric Acid
- Carbon Black Oil

- Methanol
- Butyl Acrylite

Heavy melting scrap, chemicals and newsprint are containerized cargo. Metals and soda ash are imported as break bulk. Zinc Concentrate and slag are dry bulk cargo. Phosphoric acid, carbon black oil, methanol and butyl acrylate are liquid bulk cargo. Soda ash is one of the major commodities being imported at Beypore port in Kerala.

3.3.5.2 Exports

Export basket of Industrial Goods comprise of items such as machinery, rubber & rubber products, coir, marine products, among others.

3.3.6 Foods & spices

3.3.6.1 Imports

Major items being imported at Cochin port by coastal shipping in Foods & Spices include wheat, salt and cashew nuts. Large quantum of wheat, rice and salt are also imported at Beypore port. Wheat is imported by private flour millers. The Cochin port moves around 8,000 TEUs per annum of raw cashew from West Africa, some of which are also trans-shipped to destinations such as Mangalore and Tuticorin through the coastal mode.

3.3.6.2 Exports

Exports from the Cochin port include items such as cardamom, ginger, tea, cashew kernels, and food products. Rice, vegetables and fruits are exported from Beypore port, mainly to Lakshadweep. Food items for supply of PDS system in Lakshadweep are also exported from Cochin port.

3.3.7 Others

3.3.7.1 Imports

'Others' comprise of many commodities having smaller volumes in coastal import cargo. As such these include bentonite, de-oiled cakes, cattle feed, agri-produces, timber, steel coil, tubes, etc. These items originate from multiple states including Gujarat, Delhi, Uttar Pradesh and Rajasthan. These are containerized commodities.

3.3.7.2 Exports

Commodities such as clay / kaolin powder, titanium di oxide, rutile, other minerals etc. are moved to ports in Gujarat. Onwards, some of these products move to Delhi and NCR, which is mainly done by railways from Mundra to ICD Tughlakabad / Loni. Major domestic market for titanium di oxide includes Mumbai, Delhi, Kolkata and Ahmedabad. These products are used in paper, paint and rubber industries. Timber, Iron & steel products, consumer goods are moved to Lakshadweep.

3.4 Movements of commodities by other modes

As mentioned earlier, Kerala being consumer state procures goods from other states for meeting its demands. The following sections discuss some of the important commodities having large volumes and explore the possibility of these commodities being moved by coastal shipping.

3.4.1 Food grains / food items

Food-grains are mainly imported by Food Corporation of India (FCI) which has several depots in the state. Some of the private parties import food-grains, mainly wheat, for meeting the State's mill

requirements. The estimated monthly food-grains requirement of Kerala state ranges from 60,000 to 100,000 tons and has been static for the past few years. It is estimated that in a season, 2 lac tons of wheat gets moved to Kerala, which is consumption for half of Kerala. The wheat demand is on account of growing consumption of food-stuff like bread, pastries, pizzas, etc. Pulses come from Karnataka, Tamil Nadu, Gujarat and Maharashtra.

Currently, FCI transports various food grains to Kerala from Delhi by railways. The zonal requirement of an area (say Kozhikode district) in Kerala is indicated by the relevant FCI depot to the FCI, New Delhi office and based on such a request, food-grains is transported by rail towards the FCI depot requesting for the same. Apart from the optimum inland logistics distribution cost, the security of the consignments is the prime concern for FCI and hence FCI has continued to transport food grains via railways. Pilferage of food grains usually happens during loading / unloading operations. Since the loading / unloading operations are undertaken once each at the source and the destination point while moving on rail, FCI is able to monitor the same and have in place measures for reducing pilferage. .

Moreover, it has been learnt that even if FCI uses coastal shipping, the same will be done between major ports only. Inland distribution would continue to be handled via rail / roads only.

Most of Kerala's rice demands are met by supplies from Andhra Pradesh (boiled rice) & Punjab (raw rice). At present, this rice movement is taking place by rail rakes. Additionally, rice is also getting moved from the states such as Maharashtra, Karnataka, and Andhra Pradesh by road.

Apart from the abovementioned commodities following food items are transported by road movements in Kerala:

- Atta, wheat products and bakery products
- Biscuits
- Chocolates
- Cane sugar
- Liquor & beer
- Ground nut
- Edible oils
- Mineral water
- Skimmed milk powder
- Beedi leaves
- Branded food products
- Grocery items

3.4.2 Consumer goods / durables

Kerala procures lots of consumer durables or goods from Delhi, NCR, Maharashtra, Tamil Nadu and Gujarat. These goods are moved in trucks by road transportation. As the economy of Kerala is developing, people are spending more on such goods. In addition, the state has a significant repatriation of money from the Gulf countries, increasing the replenishment demand for electronic goods. As per estimates, consumer goods such as electronic appliances get replaced in 5 to 10 years period depending on the affluence level of the family. These products include items such as refrigerators, computers, plastic goods, bicycles, VCD / DVD players, fancy goods, gifts articles, glassware, kitchen products, motor vehicles, telephone, washing machines and related spares / equipments. Electronic goods, electrical appliances, cars etc. get moved mainly from Noida / Gurgaon region. These items are being moved by road.

3.4.3 Vegetables and fruits

While most of the vegetables and fruits demand is met by neighbouring states such as Karnataka, Tamil Nadu and Andhra Pradesh, some specific crops like potato, onion, garlic are procured from Maharashtra. Considering entire Kerala, onion, potato and garlic consumption together would add up to 1 lac tons per day. Onion travels from Nasik to Mettpalayam. The wholesalers purchase the stock for the entire year during the season and then sell in Kerala throughout the year. These are also moved by road currently.

3.4.4 Cement

While cement is being transported by coastal shipping from Gujarat, it is also being imported by road from the states like Karnataka, Maharashtra, Rajasthan, Andhra Pradesh and Tamil Nadu.

3.4.5 Tiles, Marble and Granite

Tiles are moving in a major way by coastal shipping from Gujarat to Kerala. However, tiles including ceramic tiles, glazed tiles, earthen tiles, vitrified tiles and mosaic tiles are also being moved by road in the state from many other states. The prominent states having big volumes include Gujarat, Karnataka, Maharashtra, Rajasthan and Tamil Nadu. Marble and granite slabs and tiles are being moved by road from Rajasthan and Karnataka.

3.4.6 Newsprint / waste paper

Many of the companies in districts of Kottayam, Kollam and Trivandrum import newsprint / waste paper at Tuticorin port. The newsprint / wastepaper consignment is trans-shipped from Colombo to Tuticorin. It is then moved via road to the industrial units. These units may consider using the coastal shipping mode for transportation of cargo from Tuticorin to Kollam port.

3.4.7 Timber logs

Northern part of Kerala, upto Calicut, receives 70% of its timber through New Mangalore Port. The timber is then moved by road to the processing units. In South Kerala, major timber units are based in Trivandrum, Kollam and Pathanamthitta. The quantum of timber logs cargo imports for Kerala based importers is around 10,000 tons per month through Tuticorin port. The quantum of timber cargo meant for the importers based in Kollam and Trivandrum is to the extent of 4,000 tons per month. These units may consider using the coastal shipping mode for transportation of cargo from Tuticorin to Kollam port.

3.4.8 Industrial goods

Industrial goods being moved by road into Kerala includes spares, parts for automobiles, chemicals, polymers and acids, packing cases, bags, etc. These products are procured from Tamil Nadu, Karnataka and Gujarat.

3.4.9 Others / general goods

These goods include paints, medicines, polythene, pipes and fittings, books, tins, cables, generators, glass surgical equipments among many others. These goods are procured from Tamil Nadu, Karnataka, Maharashtra, Goa, and Gujarat. These are being moved by road. Products from Kerala to other states are also shipped by road transportation.

3.4.10 Coir & coir products

The volume of coir products export was 294,508.05 tons in 2009-10 which would be around 11800 FEUs (25 tons per FEU). Coir products have major domestic markets in Tamil Nadu, Andhra Pradesh & West Bengal, Delhi and NCR. The coir and coir products are mainly transported via road to these destinations. Owing to the savings in transportation costs, some of the players transport their shipments through coastal shipping to a port in Gujarat. Then, the cargo is moved by rail / road to its destination, which is mainly Delhi and NCR.

The domestic movement is estimated to be around 5000 FEUs a year. Out of this, coir movements, originating from Alappuzha, via coastal route is estimated to be 100 FEUs a year. However, given the terms of trade for coir products, the coir shipments are expected to continue to be moved mainly by road.

3.4.11 Finished fertilizers

Fertilizers in India are mainly transported by railways over the longer distances. Kerala has fertilizers units within the state. However, part of fertilizers requirements are also met by imports from outside. Fertilizers and Chemicals Travancore Limited (FACT) and Indian Potash Ltd have import requirements of finished fertilizers (urea and muriate of potash (MoP)) to the tune of around 100,000 to 150,000 tons per annum. The same is repacked (without any processing) and distributed to the farmers in South Kerala. This cargo can be distributed between the different ports using coastal shipping.

3.4.12 Cashews

Generally, raw cashew nuts are imported from Africa through Cochin / Tuticorin port. In Kerala, Kannur is the biggest cashew producing district followed by Kollam. Major domestic markets are Delhi Amritsar, Kanpur, Mumbai, Ahmedabad, Bangalore, Hyderabad and Chennai. While, there are coastal movements of cashews to these destinations, a large quantity of cargo meant for domestic markets is still being moved by road. Some quantity of cashew kernels and cashews are being moved by road from Karnataka.

3.4.13 Spices

Kerala occupies prominent position in production of spices in the country. Major spices produced in Kerala include:

- Pepper
- Cardamom (Small)
- Tamarind
- Clove
- Nutmeg
- Cinnamon
- Vanilla

Kerala is amongst the leading producers for these spices. Most of these spices are also being transported by road.

3.4.14 Coconuts

Coconuts are available in plenty in the state of Kerala. Coconuts and its variants are being transported by road to northern and central parts of India. Coconut husk is also moved in large quantities by road.

3.4.15 Natural Rubber

The state of Kerala leads in production of natural rubber, which is required by tyre and rubber products manufacturing industries. These industries are present across India and rubber is moved to northern and western parts such as Mumbai, Delhi, Jalandhar, Ahmedabad and Vadodara. The present movement is by road and there are chances of transporting this cargo through coastal mode via sea ports in Gujarat. From Gujarat, the same can be transported by road or rail depending upon the destination.

4 Traffic forecast

This chapter provides broad estimates of likely cargo traffic that can get diverted to coastal shipping from other modes such as road and rail transportation. This diversion of traffic has been derived using required and reasonable assumptions which are based on the consultants' in-house expertise as well as interactions with senior officials from stakeholder organizations. The findings are organized under below mentioned headings:

i. Cargo amenable to diversion
ii. Traffic diversion
iii. Traffic forecast

4.1 Cargo amenable to diversion

The cargo which is flowing in and out of Kerala can be transported by one or a combination of following modes of transportation:

i. Road
ii. Railways
iii. Air
iv. Inland waterways
v. Coastal shipping

Out of above mentioned five modes of transportation, inland waterways and coastal shipping are modes which are complimentary to each other for movement of cargo to and from inland destinations. The rest three modes namely, road, rail and air are competing modes of transportation. To understand the possibility of diversion of cargo traffic from these modes to coastal shipping, the consultants have analysed the commodities for different modes and dynamics affecting the choice of particular mode of transportation. The following sections discuss the possibility of cargo traffic that can be diverted to coastal shipping.

4.1.1 Possibility of diversion to coastal mode from road

Most of the goods transportation in Kerala takes place by road. As per estimates, around 20,000 trucks bring goods into Kerala every day from other states. Another 2000 trucks are estimated to be carrying goods out of Kerala to other state. As noted in the earlier chapters, all commodities, ranging from grocery items to durables and industrial goods are being moved by road. This implied that the goods are of general nature and can be transported by any mode.

The preference for road transportation emanates from the convenience of point to point connectivity by road which eliminates need for interface with other modes of transportation and multiple handling of cargo. Apart from this, the shipper does not have to wait for accumulation of cargo volume, as is case with other modes and any quantum of cargo can be shipped the moment it is ready.

The consultants interacted with many stakeholders including CHAs, cargo owners, shipping service providers, government agencies and industrial association to explore the possibility of diverting cargo from road to coastal mode. These interactions have revealed that diversion of cargo from road transportation to coastal mode would be dependent upon two prime factors:

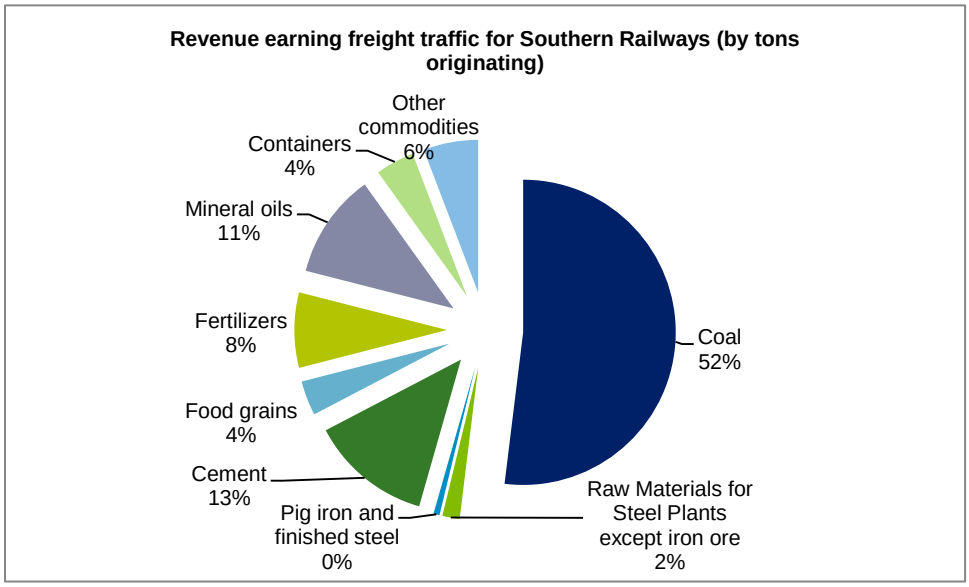
i. Total logistics cost of cargo movement from origin to destination
ii. Time taken in transportation of cargo

Stakeholders opined that if coastal shipping can provide favourable logistics cost and reasonable variation in transit time as compared to road transportation, they will be more than willing to divert the cargo to coastal mode. Accordingly, the possibility of cargo diversion from road to coastal shipping has been considered in the section titled 'Traffic Diversion'.

4.1.2 Possibility of diversion to coastal mode from rail

Indian Railways, with its reach across length and breadth of the country, is often called the backbone of transportation in India. Indian Railways transported 833 million tons of freight in year 2008-09. Major revenue earning freight traffic for railways comprises of coal, iron, fertilizers, cement and POL products. The break-up of freight traffic handled by Southern Railways is shown in Figure 4-1.

Figure 4-1: Revenue earning freight traffic fro Southern Railways



Source: Indian Railways

A major chunk of freight traffic of these goods is handled for public sector undertakings across India. For example, food-grains are mainly moved for Food Corporation of India, which prefers movement by railways. Commodities / goods meant for feeding into Public Distribution System (PDS) are also transported using railways. These units are sceptical of idea of moving the cargo via coastal mode, for consideration of safety and reliability of transportation.

Given this nature and insights received through interactions with relevant functionaries, the cargo handled by railways can be deemed as captive cargo. Accordingly, while the cargo is amenable and is likely to be economical for transportation by coastal shipping over longer distances, the cargo diversion from railways to coastal shipping has not been considered.

4.1.3 Possibility of diversion to coastal mode from air

Cargo being transported by air is usually highly expensive and meant for urgent delivery. This unique characteristics viz. quick transition of the cargo by air transportation cannot be matched by coastal shipping. Accordingly, the cargo diversion from air to coastal shipping has not been considered.

4.2 Traffic diversion

As outlined earlier, the cargo currently being moved by road is amenable for transportation by coastal shipping. However, this would depend on the total logistics cost and associated transit time for cargo movement.

The interaction with stakeholders and consequent analysis has revealed that the transit time in transportation of cargo by coastal shipping, would be similar to that by road given proper infrastructure and regular services are in place. These aspects of infrastructure and regular services have been dealt with in the chapter titled 'Infrastructure' and therefore, for purpose of analysis we take these as already existing. In the event, infrastructure for coastal shipping and regular shipping services are in place, cargo diversion would only be a function of total logistics cost.

Following steps were undertaken to calculate the quantum of goods traffic that may get diverted from road to coastal shipping:

i. Assessment of total goods flow in Kerala by road – furnished under section titled 'Traffic flow'

ii. Analysing the origin-distribution for these movements – furnished under section titled 'Origin-destination distribution'

iii. Transportation costs between the Origin- Destination pairs by road - furnished under section titled 'Transportation cost by road'

iv. Transportation costs between the Origin- Destination pairs by coastal shipping - furnished under section titled 'Transportation cost by coastal shipping'

v. Comparison of difference in transportation costs and likely quantum of traffic diversion to coastal shipping from road - furnished under section titled 'Potential diversion to coastal shipping'

4.2.1 Traffic flow

In this section, the quantum of total traffic flow by road encompassing both inward as well as outward movement have been looked at.

4.2.1.1 Data collection

The freight movements by road are not fully captured by any government or trade body in India. The Commercial Taxes Department of Kerala state tracks inter-state flow of goods that are taxable within its realm. However, the data on the entire movement of cargo in and out of the state is not captured by the Department or any other state agency.

To analyse the inter-state flow of goods between Kerala and other states of Kerala, data on transactions at check posts in Kerala was collected. There are a total of 84 check posts in the state of Kerala, out of which 11 are major check-posts. The data was collected for transactions taken place during the week of 24-30 Jan 2011. Table 4-1 shows the fields on which data was obtained for such transactions during the week.

Table 4-1: Data fields captured for check post transactions

State	Commodity	Check-post	Weight	Weight Unit	Value(Lakhs)
XXX	XXX	XXX	XXX	XXX	XXX

Adding the data so collected, suggested 104,342 tons of inward movements into the state during the week.

4.2.1.2 Data adjustments

However, the data collected had inherent limitations in terms of inadequate data as outlined below.

There are total of 84 check posts in the state of Kerala, out of which 11 are major check-posts. However, the data that was retrieved had only 13 check posts including 5 major check posts. Even so, the data captured at these 13 check posts was not exhaustive. Some of the reasons for incompleteness of data are enlisted below:

1. Data-field 'Weight' was not available for all the records
2. All the check-posts are not fully computerized and hence system does not have data for all the check-posts
3. At the computerized check-posts, all the data is not entered into the computer systems
4. Only the goods which have to pay tax at the check-posts are registered
5. Goods for which the consignors have already paid advance tax are not recorded at check posts

To overcome these limitations, based on the discussions with relevant stakeholders and analysis by the consultants, necessary adjustments were made to the data to arrive at correct picture of cargo traffic. These adjustments included:

- Sum of missing values in data-filed 'Weight' was derived using the comparison between values of goods
- Analysis of vehicles count captured by the computerized system and estimates of actual vehicle counts at select check posts was used to make for the missing data, on goods that has not been captured in the system at select check posts
- Finally, figure was adjusted for the data on goods which are not registered at check-posts owing to their differential treatment for commercial tax purpose.
- Further, it was learnt that the goods movement remains same throughout the year, though the composition of goods basket may show seasonal variation. Therefore, the data on goods movement for the week has been simply extended for entire year.

Final figure for inward goods movements by road after incorporating these adjustments was estimated to be 611.55 million tons in a year.

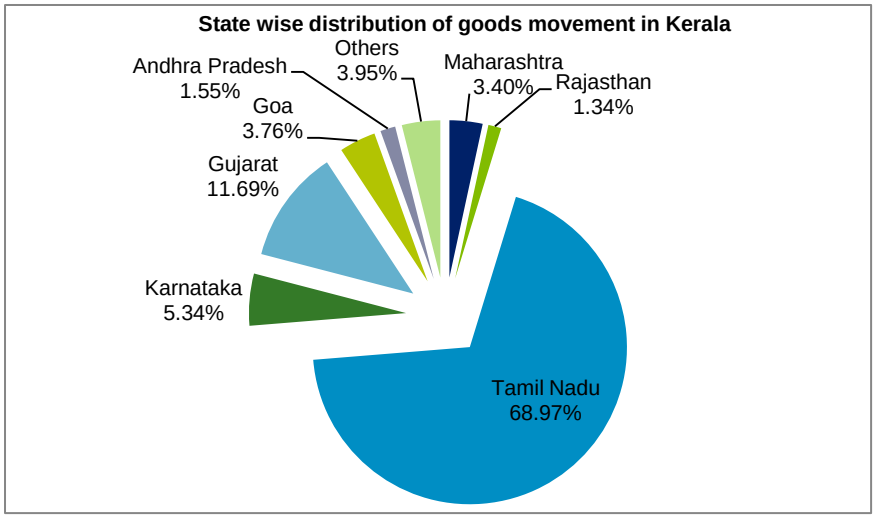
4.2.2 Origin-destination distribution

In this section we look into the details of origins of goods moving into Kerala and its distribution across districts.

4.2.2.1 Origins

The state wise origin-distribution of goods movement into Kerala is shown in Figure 4-2. This is based on the data on transactions at check-posts. The state wise distribution broadly concurs with the responses received during interaction with transport operators in Kerala and hence the same has been considered as it is by the consultants.

Figure 4-2: State wise distribution of goods movement in Kerala



Source: Commercial Taxes Department, Deloitte analysis

Based on the above, the commercial centres in each of the states were tracked, which would be major origin points for goods flowing into Kerala, as listed in Table 4-2.

Table 4-2: State wise major origin centres

State	Origin
Rajasthan	
	Ajmer
	Jalor
	Udaipur
Gujarat	
	Morbi
	Ankleswar
	Ahmedabad
Maharashtra	
	Mumbai
	Nashik
	Kolhapur
	Nagpur
Goa	
	Panaji
Karnataka	
	Mysore
	Belgaum
	Bangalore

State	Origin
Tamil Nadu	
	Chennai
	Madurai
	Coimbatore
	Tirunelveli
Andhra Pradesh	
	Hyderabad
	Visakhapatnam

Source: Deloitte analysis

4.2.2.2 Destination distribution in Kerala

As learnt during the study, all the commodities are being transported by road to various parts of Kerala. These commodities comprise of the consumption goods as well as goods for industrial use. As a result, the demand for goods in districts can be assumed to be directly proportional to the economic activity in the state. Therefore, we can take the GSDP distribution across districts, as proxy for distribution of goods in Kerala. The GSDP distribution across districts in Kerala is shown in Table 4-3.

Table 4-3: District wise GSDP distribution in Kerala

District	GSDP Share
Kasargod	3.3%
Kannur	7.2%
Wayanad	1.8%
Kozhikode	8.8%
Malappuram	7.6%
Palakkad (north)	2.3%
Palakkad (south)	5.3%
Thirussur	9.9%
Ernakulam	14.7%
Idukki	3.2%
Kottayam	7.0%
Alappuzha	6.5%
Pathanamthitta	3.9%
Kollam	7.4%
Thiruvanantpuram	11.1%
Kerala Total	100%

Source: Kerala Economic Review 2009, Deloitte Estimates

4.2.2.3 Goods outflow from Kerala

As noted in the earlier section, the quantum of goods moving out of Kerala is around 2000 truckloads a day. Using our analysis for the check-post transactions, average truckload is 8.40 tons. Using this information, the quantum of outward flow of goods from has been deduced in Table 4-4.

Table 4-4: Outward flow of goods from Kerala

Particular	Unit	Value
No. of trucks per day	Nos.	2,000
Average truckload	Tons	8.40
Total tonnage per day	Tons	16,800.91
Total goods outflow in a year	Tons	6,132,333.52
Total goods outflow in a year	'000 Tons	6,132.33

Source: Commercial Taxes Department, Deloitte analysis

The quantum of goods moving out of Kerala from different districts would be proportional to economic contribution of the respective district. Therefore, the distribution of outward goods movement from different districts would be same as in Table 4-3.

4.2.2.4 Goods movements

Table 4-5 summarizes the inward and outward movements of goods by road transportation in Kerala.

Table 4-5: Goods movement by roads in Kerala

Particular	Unit	Value
Total inward goods movement in a year	'000 Tons	61,155.32
Total goods outflow in a year	'000 Tons	6,132.33
Total goods movement in a year	'000 Tons	67,287.66

4.2.3 Transportation cost by road

4.2.3.1 Origin-destination distance chart

Based on the origin-destination profile for goods movement identified in previous section, a distance matrix for each pair of origin and destination was developed. For simplifying further analysis, the origin points in a state were put together and destination districts in Kerala were grouped together depending upon geography. Table 4-6 and Table 4-7 show the mapping of origin and destination points respectively.

Table 4-6: Grouping of Origin points

Origin	State
Ajmer	Rajasthan
Jalor	Rajasthan
Udaipur	Rajasthan
Morbi	Gujarat
Ankleswar	Gujarat
Ahmedabad	Gujarat

Origin	State
Mumbai	Maharashtra
Nashik	Maharashtra
Kolhapur	Maharashtra
Nagpur	Maharashtra
Panaji	Goa
Mysore	Karnataka
Belgaum	Karnataka
Bangalore	Karnataka
Chennai	Tamil Nadu
Madurai	Tamil Nadu
Coimbatore	Tamil Nadu
Tirunelveli	Tamil Nadu
Hyderabad	Andhra Pradesh
Visakhapatnam	Andhra Pradesh

Table 4-7: Grouping of Destination points

District	Region
Kasargod	Upper North Kerala
Kannur	Upper North Kerala
Wayanad	North Central Kerala
Kozhikode	North Central Kerala
Malappuram	North Central Kerala
Palakkad	North Central Kerala
Thirussur	Central Kerala
Ernakulam	Central Kerala
Idukki	Central Kerala
Kottayam	Central Kerala
Alappuzha	Central Kerala
Pathanamthitta	South Kerala
Kollam	South Kerala
Thiruvanantpuram	South Kerala

The distances were averaged for the grouped origin and destination points. Table 4-8 is the reduced matrix showing distance between different pairs of these origin and destination.

Table 4-8: Road distance chart (distance in Kms.)

State	Upper North Kerala	North Central Kerala	Central Kerala	South Kerala
Rajasthan	1891	2062	2251	2374
Gujarat	1551	1718	1910	2034
Maharashtra	1052	1200	1399	1521
Goa	475	660	854	978
Karnataka	355	418	615	736
Tamil Nadu	528	386	353	370
Andhra Pradesh	1117	1135	1301	1390

Source: Deloitte analysis

4.2.3.2 Freight rates

The consultants carried out in-depth analysis of costs for transportation of goods by road. Detailed data was collected from many of the fleet operators in different parts of Kerala as well as in other states such as Gujarat and Rajasthan. The results of analysis, i.e. the cost of transportation by road for different pair of distances, are shown in Table 4-9.

Table 4-9: Freight rates for transportation by road

Distance in km		Rs./MT/Km
From	To	
1,800		1.7
1,200	1,800	1.9
1,000	1,200	2.1
800	1,000	2.2
400	800	2.3
250	400	2.5
150	250	2.7
100	150	3
50	100	3.5
20	50	3.5
0	20	3.5

Source: Deloitte analysis

4.2.3.3 Road freight cost between O-D

The distances shown in Table 4-8 were multiplied with appropriate rates from Table 4-9. The results are shown in Table 4-10 which is the per ton freight cost for goods transportation between the origin-destination pair by road.

Table 4-10: Transportation cost by road between O-D (Rs. per ton)

State	Upper North Kerala	North Central Kerala	Central Kerala	South Kerala
Rajasthan	3215	3505	3826	4036
Gujarat	2947	3264	3248	3458
Maharashtra	2209	2281	2659	2889
Goa	1091	1517	1879	2151
Karnataka	888	960	1415	1692
Tamil Nadu	1213	964	883	924
Andhra Pradesh	2345	2384	2471	2641

Source: Deloitte analysis

4.2.4 Transportation cost by coastal shipping

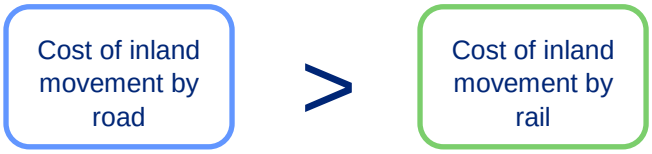
Transportation by coastal shipping is inter-modal transportation and requires other modes such as rail or road for point to point transportation. The origin-destination by coastal shipping can be broadly considered as combination of following components:

i. Inland movement from origin to loading port by road / rail / inland waterways
ii. Coastal movement from loading port to unloading port by coastal shipping
iii. Inland movement from unloading port to destination by road / rail / inland waterways

As per findings, currently the inland movement (last mile connectivity between port and origin / destination) is primarily through roads. Shippers in northern states such as Delhi also transport cargo using railways to and from the port. As such, the cost of transportation by rail will be cheaper than road for such cases, as represented graphically in Figure 4-3.

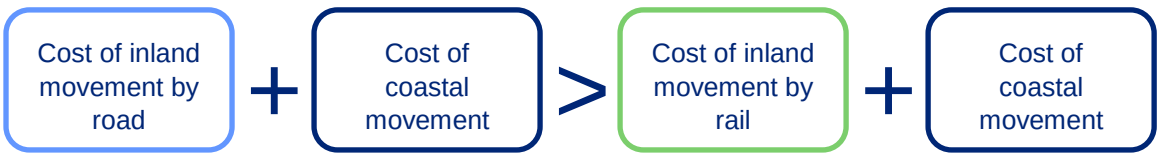
Figure 4-3

Figure 4-3: Cost of inland movement



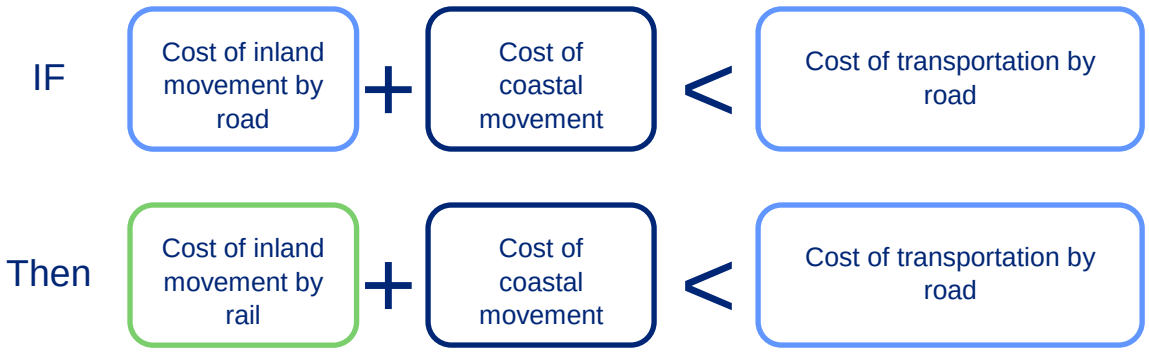
If we add the cost of coastal movement, the equation would become as represented in Figure 4-4.

Figure 4-4: Transportation cost by different modes of inland movement



This implies that if the cost of coastal shipping using roads for inland movement is lower than the cost of transportation by road, then cost of coastal shipping using rail for inland movement would also be lower than the cost of transportation by road. This is represented graphically in Figure 4-5.

Figure 4-5: Equation for coastal movement using different modes of inland movement



Therefore, for purpose of analysis, we consider inland movement by road only. The calculation of component-wise transportation cost is worked out in the following sections. In doing, so the inward movement of goods into Kerala has been considered.

4.2.4.1 Inland movement from origin to loading port

Table 4-11 shows the preferred loading port, its distance from the origin and freight charges for inland transportation for each of the origin centre for coastal movement of cargo. The freight charge has been calculated using the Table 4-9.

Table 4-11: Inland movement from origin to loading port by road

Origin	Preferred loading port	Distance (kms.)	Freight charge for inland movement (Rs. per ton)
Ajmer	Kandla / Mundra	703	1616.9
Jalor	Kandla / Mundra	434	998.2
Udaipur	Kandla / Mundra	522	1200.6
Rajasthan Average		**553**	**1271.9**
Morbi	Navlakhi	45	157.5
Ankleswar	Dahej	70	245.0
Ahmedabad	Kandla / Mundra	299	747.5
Gujarat Average		**138**	**383.5**
Mumbai	JNPT	50	175.0
Nashik	JNPT	195	526.5
Kolhapur	JNPT	387	967.5
Nagpur	JNPT	870	1914.0
Maharashtra Average		**375.5**	**895.8**
Panaji	Mormugao	34	119.0
Goa Average		**34**	**119.0**
Mysore	Azhikkal	191	515.7
Belgaum	Mormugao	133	399.0
Bangalore	Mangalore	349	872.5
Karnataka Average		**224.33**	**595.7**

Origin	Preferred loading port	Distance (kms.)	Freight charge for inland movement (Rs. per ton)
Chennai	Chennai	8	28.0
Madurai	Tuticorin	137	411.0
Coimbatore	Beypore	173	467.1
Tirunelveli	Tuticorin	55	192.5
Tamil Nadu Average		**93.25**	**274.7**
Hyderabad	Kakinada	465	1069.5
Visakhapatnam	Visakhapatnam	10	35.0
Andhra Pradesh Average		**237.5**	**552.3**

4.2.4.2 Coastal movement from loading port to unloading port

4.2.4.2.1 Unloading port

Before proceeding further, unloading ports need to be identified for coastal movement. For movement to various parts of Kerala, the consultants have zeroed-in on location of ports along the coast of Kerala based on following considerations:

- Coverage of entire state with optimal number of ports
- Consumption and commercial activity centres in vicinity
- Stakeholders' interaction
- Distance with major port
- Port development plans
- Investments requirement

Keeping these considerations in mind, the following port locations have been considered:

i. Azhikkal
ii. Beypore
iii. Cochin
iv. Kollam

It should be noted that while Cochin port does not come under purview the State Government, it will continue to handle the coastal cargo meant for the State. Infrastructure is already in place at Cochin port and the State can harness the benefits of this port without any significant investments.

However, in the long run it would be in the interest of the State Government to develop a port, dedicated for coastal operations, in close vicinity of Cochin port. This is for the reason that Cochin port being a major port would be more interested to handle EXIM cargo than coastal cargo. A share of coastal cargo projected at Cochin port can surely get routed through the chosen port. This port can also handle feeder operations for EXIM cargo at Cochin port. As the State Government already has plans for development of Alappuzha port, the same can be developed for coastal cargo.

Coverage of hinterland across the state with these ports is graphically shown in the figure. Each of these ports covers the centres of commercial activities in their respective hinterland. Coastal shipping is usually most cost-economical when the inland movement is in vicinity of 100 km of the port. These ports which are almost equidistant with each other cover the hinterland in range of 100 km. The Government of Kerala has considered Azhikkal, Beypore, Alappuzha and Kollam for development of port facilities and hence it concurs with the port development plans of the State. Except for Alappuzha, basic port infrastructure at these locations already exists, which can be upgraded at relatively lower investment. Stakeholders have opined for the development of port and related infrastructure at these locations.

4.2.4.2.2 Coastal distance

For calculating the coastal freight, coastal distances between loading and unloading ports have been worked out between loading and unloading ports and have been shown in Table 4-12. It should be noted that these distances, being estimated by consultants for some of ports, may have little deviation from the actual distance.

Table 4-12: Distance between ports in nautical miles

Ports	Azhikkal	Beypore	Cochin	Kollam
			(distance in nautical miles)	
Kandla / Mundra	877	933	992	1106
Navlakhi	837	912	972	1082
Dahej	594	669	729	839
JNPT	465	520	580	690
Mormugao	261	316	376	486
Azhikkal	0	55	115	225
Mangalore	91	146	206	316
Chennai	773	828	888	998
Tuticorin	121	176	236	346
Beypore	55	0	60	170
Kakinada	408	463	523	633
Visakhapatnam	1038	1093	1153	1263

Source: Deloitte analysis

4.2.4.2.3 Coastal freight

The consultants have obtained details of freight charged by shipping companies for transportation of containers from Kandla to Cochin. Using the same, coastal freight rate per ton per nautical mile has been deduced in Table 4-13.

Table 4-13 Coastal freight rates

Particular	Value (Rs.)
Per TEU (28 tons) coastal freight from Kandla to Cochin excl. THCs	32,700
THC at both ports	6000

Total freight + THCs	38,700
Distance (NM) between Kandla and Cochin	992
Freight rate per TEU per NM	39.01
Freight rate per ton per NM	1.39

Source: Deloitte analysis

Using the freight rate from Table 4-13 Coastal freight rates and distance from Table 4-12, the total coastal freight between ports have been worked out in Table 4-14.

Table 4-14: Coastal freight charges (in Rs. per ton)

Ports	Azhikkal	Beypore	Cochin	Kollam (Rs. per ton)
Kandla / Mundra	1222	1300	1382	1541
Navlakhi	1166	1271	1354	1507
Dahej	828	932	1016	1169
JNPT	648	725	808	961
Mormugao	364	440	524	677
Azhikkal	0	77	160	313
Mangalore	127	203	287	440
Chennai	1077	1154	1237	1391
Tuticorin	169	245	329	482
Beypore	77	0	84	237
Kakinada	568	645	729	882
Visakhapatnam	1446	1523	1606	1760

Using the information from Table 4-11 and Table 4-14, the average coastal freight between pairs was calculated and is furnished in

Table 4-15.

Table 4-15: Coastal freight between O-D pairs (Rs. per ton)

State	Upper North Kerala	North Central Kerala	Central Kerala	South Kerala
Rajasthan	1222	1299.9	1382	1541
Gujarat	1072	1168	1251	1406
Maharashtra	648	725	808	961
Goa	364	440	524	677
Karnataka	163	240	324	477
Tamil Nadu	373	411	495	648

Andhra Pradesh	1007	1084	1168	1321

4.2.4.3 Inland movement from unloading port to destination

Table 4-16 shows the distance between unloading port and freight charges for inland transportation.

Table 4-16: Inland freight charges from unloading port to destination

Unloading port	Destination	Distance (kms.)	Freight charge for inland movement (Rs. per ton)
Kasargod	Azhikkal	95	333
Kannur	Azhikkal	11	39
Upper Kerala Average		**53**	**186**
Wayanad	Beypore	87	305
Calicut	Beypore	11	39
Malappuram	Beypore	40	140
Palakkad	Beypore	120	360
North Central Kerala Average		**64.5**	**226**
Cochin	Cochin	15	53
Idukki	Cochin	110	330
Kottayam	Cochin	65.8	230
Thirussur	Cochin	85.7	300
Alappuzha	Cochin	50	175
Central Kerala Average		**65.30**	**229**
Kollam	Kollam	15	53
Pathanamthitta	Kollam	120	360
Trivandrum	Kollam	67	235
South Kerala Average		**67**	**236**

4.2.4.4 Total O-D cost using coastal shipping

Table 4-17 provides the total logistics cost between O-D pairs. This cost is inclusive of Terminal Handling Charges (THCs) at both the ports. However, it should be noted that the THC at non-major ports is a variable under the control of the State Government. The State Government, with a view to promote coastal shipping, may suitably determine THC as would be conducive for coastal shipping. THC at non-major ports is likely to be lower than the estimates taken by the consultants and therefore the transportation cost between O-D pairs would also be lower.

Table 4-17: Transportation cost by Coastal Mode between O-D (Rs. per ton)

State	Upper North Kerala	North Central Kerala	Central Kerala	South Kerala
Rajasthan	2679	2798	2883	3049
Gujarat	1671	1807	1893	2055
Maharashtra	1772	1889	1975	2136

Goa	668	785	871	1032
Karnataka	955	1072	1158	1318
Tamil Nadu	885	963	1050	1210
Andhra Pradesh	1834	1951	2037	2198

4.2.5 Potential diversion to coastal shipping

The Table 4-18 highlights the difference in total transportation cost between road and coastal shipping, which has been derived from subtracting the freight charge in Table 4-17 (Transportation cost by Coastal Mode between O-D pairs) from Table 4-10 (Transportation cost by road between O-D pairs).

Table 4-18: Difference between total transportation cost between road & coastal shipping (Road minus coastal shipping, Rs. per ton)

State	Upper North Kerala	North Central Kerala	Central Kerala	South Kerala
Rajasthan	536	707	944	988
Gujarat	1276	1456	1354	1402
Maharashtra	437	392	683	753
Goa	423	732	1007	1119
Karnataka	-66	-111	257	373
Tamil Nadu	329	1	-167	-286
Andhra Pradesh	511	433	434	444

Based on the differences in cost, the consultants have categorized the advantage under different categories and have assigned varied % for shift to coastal mode as shown in Table 4-19.

Table 4-19: Diversion matrix

Cost difference	Advantage	% Shift to coastal mode
Negative	Nil	0%
Upto 500 Rs. per ton	Low	10%
Between 500 to 1000 Rs. per ton	Medium	20%
More than Rs. 1000 per ton	High	30%

The % shift in the diversion matrix is *solely* based on total transportation cost and does not take into account the external factors such as:

i. Roads in Kerala are narrower and congested leading to delays in transportation. Moreover, there are restrictions on containers movements during day-time. Stakeholders would be more than happy to have alternative mode of transportation which is speedy and reliable.

ii. Incentives that Government may provide for promotion of coastal shipping

iii. While calculating coastal freight rate, the consultants have taken the current freight being charged by the shipping companies. With relaxation in cabotage law for ICTT

Vallarpadam and enactment of River-Sea Vessels Act, more players are expected to enter the industry, who will be offer to provide the services at far lower freight rate.

These aspects have been addressed in the chapter titled 'Economics of Coastal Movements'.

The advantage matrix for each O-D pair, derived from the Table 4-18 and Table 4-19, is presented in Table 4-20.

Table 4-20: Advantage matrix

State / Region	Maharashtra	Rajasthan	Tamil Nadu	Karnataka	Gujarat	Goa	Andhra Pradesh
Upper North Kerala	Low	Medium	Low	Nil	High	Low	Medium
North Central Kerala	Low	Medium	Low	Nil	High	Medium	Low
Central Kerala	Medium	Medium	Nil	Low	High	High	Low
South Kerala	Medium	Medium	Nil	Low	High	High	Low

Using the information, the quantum of goods movement that may get diverted from road to coastal shipping is furnished in

Table 4-21 and summarized in Table 4-22.

Table 4-21: Cargo shift to coastal mode ('000 tons)

State / Region	Maharashtra	Rajasthan	Tamil Nadu	Karnataka	Gujarat	Goa	Andhra Pradesh	Total
Upper North Kerala	24.0	18.9	487.3	0.0	247.8	26.6	21.9	826.5
North Central Kerala	46.9	36.9	950.4	0.0	483.3	103.6	21.4	1642.5
Central Kerala	213.3	84.1	0.0	167.5	1100.1	353.8	48.6	1967.5
South Kerala	102.5	40.4	0.0	80.5	528.6	170.0	23.4	945.3

Table 4-22: Divertible coastal cargo at ports ('000 tons)

Region	Port	Quantity
Upper North Kerala	Azhikkal	826.5
North Central Kerala	Beypore	1642.5
Central Kerala	Cochin	1967.5
South Kerala	Kollam	945.3
Kerala		5381.8

In addition to the divertible cargo traffic as mentioned in Table 4-22, there would be cargo traffic on account of following considerations:

i. Existing coastal cargo
ii. Feeder operations that will take place for EXIM cargo
iii. Increase in containers traffic owing to ICTT Vallarpadam
iv. Establishment of new industrial units in SEZs in the State

Hence, the actual cargo traffic would be sum of cargo traffic from each of these components. As focus of the study is coastal shipping, we restrict our analysis to coastal cargo only. For total cargo traffic, the projected cargo traffic as per Maritime Agenda 2010-20 can be used as furnished in Table 4-27.

4.3 Traffic forecast

4.3.1 Cargo growth rate

As for divertible coastal cargo, it includes all the commodities and hence the growth rate should be similar to GSDP growth rate. The GSDP growth rate for Kerala was 6.98% (at constant prices) in year 2008-09. Based on the economic trends, the GSDP growth rate is likely to remain at that level in coming years. CAGR for cargo traffic at non-major ports in India from 2000-01 to 2009-10 was 14.2%. Maritime Agenda 2010-2020, projects that the cargo traffic in maritime states would grow at CAGR of 16% until 2020.

4.3.2 Coastal cargo growth rate

Coastal cargo at all ports in India has registered a CAGR of 3.31% during 2000-01 to 2009-10. However, the same was 6.15% for non-major ports in India and 2.76% at non-major ports in Kerala. With the development of non-major port locations along Kerala, the traffic meant for north and south Kerala would be diverted towards the non-major ports catering to these regions and facilitate in reducing the logistics cost. Accordingly with the keen intent of Government of Kerala in developing the non-major port locations, the coastal cargo traffic should see higher growth rate in coming years. Considering above mentioned aspects, the consultants expect that the coastal cargo in Kerala should grow in line with the state GSDP growth, which averaged 8.74% for past 5 years. However, for arriving at the coastal cargo traffic forecast, the consultants have taken a conservative CAGR of 7% until year 2020.

4.3.3 Coastal cargo traffic forecast

Table 4-23 shows the coastal cargo at selected ports in Kerala. The forecast for divertible and existing coastal cargo using the growth rate from previous section has been furnished in Table 4-24 and Table 4-25.

Table 4-23: Coastal cargo traffic at ports in Kerala (million tons)

Port	Divertible	Existing	Total
Azhikkal	0.83	0.00	0.83
Beypore	1.64	0.12	1.76
Cochin	1.97	4.24	6.21
Kollam	0.95	0.01	0.96

Table 4-24: Divertible coastal cargo traffic forecast at ports in Kerala (million tons)

Port	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Azhikkal	0.88	0.95	1.01	1.08	1.16	1.24	1.33	1.42	1.52	1.63
Beypore	1.76	1.88	2.01	2.15	2.30	2.46	2.64	2.82	3.02	3.23
Cochin	2.11	2.25	2.41	2.58	2.76	2.95	3.16	3.38	3.62	3.87
Kollam	1.01	1.08	1.16	1.24	1.33	1.42	1.52	1.62	1.74	1.86
Non-major ports	3.65	3.91	4.18	4.48	4.79	5.12	5.48	5.87	6.28	6.72

Table 4-25: Existing coastal cargo traffic forecast at ports in Kerala (million tons)

Port	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Azhikkal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beypore	0.13	0.13	0.14	0.15	0.16	0.18	0.19	0.20	0.22	0.23
Cochin	4.54	4.86	5.20	5.56	5.95	6.37	6.81	7.29	7.80	8.35
Kollam	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Non-major ports	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.22	0.23	0.25

The divertible coastal cargo traffic shown in Table 4-24 has been arrived at assuming that the requisite infrastructure and regular services already exists. However, the infrastructure needs to be developed for coastal cargo, which is likely to take 2-3 years. Hence, the divertible cargo will not be coming at the ports before 2013-14. Further Cochin port does not come under purview of the State Government and hence for purpose of planning, it is not included in the total cargo forecast. Accordingly, the total coastal cargo at non-major ports has been furnished in Table 4-26. The total cargo traffic at non-major ports in Kerala projected by Maritime Agenda 2010-2020 has been shown in Table 4-27.

Table 4-26: Total coastal cargo at non-major ports in Kerala (million tons)

Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Divertible	-	-	-	4.48	4.79	5.12	5.48	5.87	6.28	6.72
Existing	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.22	0.23	0.25
Total	0.14	0.15	0.16	4.64	4.97	5.32	5.69	6.09	6.51	6.97

Table 4-27: Cargo traffic forecast at non-major ports in Kerala as per Maritime Agenda 2010-2020

Year	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Total cargo	0.26	2.46	5.49	7.51	9.30	11.39	13.24	15.33	27.27

The infrastructure requirement for coastal shipping has been done on basis of Table 4-26. The same has been dealt with in chapter titled 'Infrastructure'

5 Passenger traffic

Coastal Shipping has long been propagated as a fuel efficient and economical means of not just transporting cargo, but also moving scores of passengers from one location along the coast to another. The renowned Norwegian hurtigbater (express boats) & high-speed passenger ferries of Australia demonstrate promising prospects for coastal passenger movement globally. Moreover, India's 7500-km long coastline, increasing pressure on conventional modes of transport like road / rail, and focus on environment friendly living makes a compelling case for exploring the feasibility of the much talked about coastal movement.

The present day situation calls for taking one step forward and delving deeper into the cost economics underlying the perceived savings resulting from choosing coastal transportation over alternative modes. Based on interactions with stakeholders, it was ascertained that the passenger movement in Kerala, relevant from perspective of coastal shipping, can be classified under three categories.

I. Long distance (rail) passengers travelling to / from Kerala
II. Short distance (road) traffic between different pairs of Kerala's coastal districts
III. Tourist (cruise) traffic to Kerala

A detailed analysis has been performed to determine the possibility & associated costs of diversion of present passenger traffic in Kerala to coastal route. For long distance travel, air transport, by virtue of being the fastest, most convenient, and yet relatively economical mode of transportation, doesn't seem to compete with any other mode. For short distance travel, on the other hand, air transport may not be a viable alternative. On account of these factors, it has been excluded from the analysis.

The analysis comprises a step-by-step approach to traffic forecasting and is based on realistic assumptions & estimates, wherever deemed necessary.

5.1 Long distance passengers travelling to / from Kerala

Mumbai, Chennai, and Delhi are major hubs with numerous trains running to the business districts of Ernakulam and Trivandrum in Kerala & back on a daily basis. As such, every week a large number of passengers travel by train between these sets of O-D pairs. Among these, Chennai is coastally far distant from the business districts of Ernakulam and Trivandrum, and therefore possibility of shift of rail traffic along Chennai – Ernakulam / Trivandrum routes to coastal mode doesn't exist. On the other hand, Delhi is not just distant but is also landlocked; this will render coastal movement between Delhi & Kerala infeasible in terms of both time and cost. However, Mumbai, due to its coastal location and relatively closer proximity to Kerala, demonstrates a fair possibility of shift of passenger rail traffic to coastal route. The consultants, for purpose of analysis, have therefore considered rail movement of passengers on the Mumbai – Ernakulam and Mumbai – Trivandrum routes, as a most promising case for coastal movement of long distance passengers.

Step 1: Collection of data pertaining to passenger trains passing between Mumbai – Ernakulam & Mumbai – Trivandrum

For the purpose of this analysis, only passengers travelling in air-conditioned compartments have been considered since the ticket cost of the speed craft is likely to be on the higher side and sleeper class passengers may not afford the same. All relevant details of passenger trains, plying along the Mumbai-Ernakulam-Mumbai & Mumbai-Trivandrum-Mumbai routes viz., train numbers & names, number of seats, travel time, weekly frequency and class-wise fares were extracted from the website of Indian Railways. In case of inadequate information pertaining to seat availability for any particular train, the class-wise tatkal seats were taken as base for arriving at the total number of seats for each

class. This flows from the assumption that 20 per cent of tickets of each class are available under Tatkal quota. In instances where information on seats was not available, further to a suggestion by Southern Railways, a total of 1000 seats were assumed per train and divided between A/C and Non-A/C classes in the ratio of 1:4. Again, for trains running beyond the Mumbai-Ernakulam-Mumbai & Mumbai-Trivandrum-Mumbai routes, the consultants have estimated figure corresponding to 30 per cent of A/C seats available on those trains as number of passengers travelling between Mumbai and Ernakulam / Trivandrum. Kanyakumari / Cape Mumbai Express is the only exception in this case, as very few passengers travel by train to / from Kanyakumari. Average fares have been calculated for each train by averaging the individual fares for A/C classes.

Step 2: Estimation of number of weekly passengers travelling along the two rail routes

All trains running between Mumbai & Trivandrum halt at Ernakulam. Therefore, 12 of the 17 trains are common to Ernakulam & Trivandrum. There are 5 other trains, which connect only Mumbai & Ernakulam. In respect of common trains, barring a few exceptions, it is assumed that 50 per cent of the passengers under consideration are Trivandrum bound and remaining 50 per cent are Ernakulam bound.

The estimate of daily passengers travelling by each of these trains has been multiplied by the respective weekly frequencies of these trains so as to arrive at the total weekly passenger figures.

Step 3: Total cost incurred for train travel

Cost associated with last mile connectivity at both ends has been added to the average fare on different trains computed in Step 1 above to obtain the total cost for train travel. For the purpose of this analysis, last mile connectivity refers to road transport between origin / destination and the nearest station along the train route. An average road distance of 30 km is assumed upto a nearest station in Mumbai and 10 kms. & 5 kms. taken as indicative distances between Ernakulam / Trivandrum stations and respective towns. These distances are multiplied by an indicative fare of ₹ 5/- per km assumed for last mile transportation.

Step 4: Total time (in decimal hours) required for train travel

The time taken to travel from place of origin to boarding station and then from the last station to the destination is added to the actual time taken for the train journey. The time for road movement is calculated at speeds of 20 kmph & 30 kmph, assumed for distances upto 10 kms & beyond 10 kms respectively.

Step 5: Total cost of opting for coastal movement

This is largely dependent on the cost of operating the ferry line, which in turn depends on several factors such as distance covered, desired speed & corresponding engine type / fuel consumption, passenger capacity, etc. The fare will directly vary with the speed & level of convenience / facilities offered on-board the passenger vessel. Typically, therefore, a speed craft providing sleeping facility to passengers will imply a higher per passenger fare to make up for the loss of revenue that could otherwise accrue from accommodating more passengers in the same space.

As per discussions and interactions with stakeholders and a leading catamaran manufacturer, specification of an Austal catamaran which would suit the intended operations have been considered. These specifications are furnished in Table 5-1.

Table 5-1: Specifications of the assumed catamaran model

Particulars	Specification
Intended operations	Commuter ferry suitable for medium duration trips in inshore and coastal waters and designed for efficient boarding and disembarkation of passengers
Main Engines	4 x MTU16V2000M72 (IMO Tier II compliant)
Speed	38 knots
Fuel consumption	1,333 litres of diesel per hour
Passengers	439
Crew	11

Source: Austal

With diesel consumption of 1,333 litres per hour, the fuel cost will amount to ₹ 55,986/- @ ₹ 42/- per litre. Given that the catamaran has a speed of 38 knots and it carries 439 passengers in one trip, the unit fuel cost will work out to ₹ 3.35 per passenger per nautical mile (~ ₹ 1.81 per kilometre). Further, considering fuel cost to constitute 70 per cent of the total cost, we arrive at per km total cost of ₹ 2.59. This cost coupled with ~ 30 per cent profit margin will result in per km fare of ₹ 3.45/-.

To get the indicative coastal fare per passenger, this unit fare is multiplied with the corresponding coastal distance from Gateway of India / Ballard Pier to Cochin or Trivandrum, as the case may be.

For determining the last mile connectivity costs with respect to coastal movement, an average road distance of 20 km is assumed from a place in Mumbai upto Gateway of India / Ballard Pier and 14.4 kms & 14.3 kms taken as indicative distances between Cochin / Trivandrum and respective waterfront locations. These distances are multiplied by an indicative fare of ₹ 5/- per km assumed for last mile transportation.

The total cost of opting for coastal movement is obtained by adding the last mile connectivity costs to the coastal fare. Thus while the last mile connectivity cost works out to ₹ 172/-, the coastal fare component works out to ₹ 3,633/- and ₹ 4,423/- for Mumbai-Ernakulam-Mumbai & Mumbai-Trivandrum-Mumbai routes respectively. The two components together result in coastal movement costing in the range of ₹ 3,805/- to ₹ 4,594/-

Step 6: Likely total time (in decimal hours) for coastal journey

In addition to the total travel time comprising of the last mile journey and coastal movement, the time required for re-fuelling at a mid-way location and waiting time at the origin & destination port needs to be factored in. An indicative time of 1 hour for re-fuelling and total waiting time of 2 hours have been considered.

Step 7: Likely time saving (if any) on opting for coastal movement

The likely time for coastal journey is compared with the time taken for train journey in arriving at the potential time saving due to coastal movement. With the journey times varying across different trains, traffic diversion analysis based on absolute time saving will be largely misleading. Instead,

computation of potential time saving as a percentage of time taken by conventional mode (rail in this case) would be a prudent alternative. The time saving is, therefore, determined as a percentage of time taken by rail journey and a competitive advantage criterion determined to assign percentages for traffic diversion based on such time saving.

The average time savings on each trip and associated frequency (number of trains) resulting from coastal movement along the two routes can be summarized as under:

Table 5-2: Summary of route-wise time saving expected from coastal movement

Route / Potential Time Saving	*Mumbai-Ernakulam-Mumbai*		*Mumbai-Trivandrum-Mumbai*	
	No. of trains	Avg. time saved (in decimal hours)	No. of trains	Avg. time saved (in decimal hours)
Upto 5 hours	17	3.35	8	3.44
5 – 10 hours	13	6.69	12	7.09
10 hours & above	4	18.61	4	20.05

From the above table, it is evident that along the Mumbai-Ernakulam-Mumbai route, major time saving potential is demonstrated by the slabs of upto 5 hours and 5 – 10 hours with total of 30 trains.

Along the Mumbai-Trivandrum-Mumbai route, the frequency represented by number of trains is the maximum for potential time saving slab of 5 – 10 hours with average time saving of 7.09 hours.

Step 8: Expected weekly shift to coastal mode

By and large, the decision to choose one mode over the other is influenced by the factors like time, cost, and convenience. Convenience is a subjective term and is bound to vary from individual to individual. However, since rail transport is most economical, sea passage by passenger ships cannot compete with it in terms of cost unless it is subsidized by Government or by other related profitable activities such as food, entertainment, cargo freight, sale of high end goods etc. In consideration of the same, expected weekly shift of passenger traffic to coastal route has been based only on time saving.

The following competitive advantage criterion has been employed for arriving at the weekly shift:

Table 5-3: Criterion for determining likely shift from rail to coastal route

Level of Competitive Advantage	Potential Time Saving (as % of time taken for rail journey)		Associated Diversion Possibility
	From	To	
Level 0	-	0	0%
Level 1	0	10	5%
Level 2	10	20	10%
Level 3	20	30	15%
Level 4	30	40	20%

Level of Competitive Advantage	Potential Time Saving (as % of time taken for rail journey)		Associated Diversion Possibility
	From	To	
Level 5	40	50	25%
Level 6	50	-	25%

The expected weekly shift is thereafter calculated by multiplying the train-wise weekly passenger number with the corresponding diversion percentage as per the criterion above.

Therefore, the expected shift along the Mumbai-Ernakulam-Mumbai route is 1343 passengers and that along the Mumbai-Trivandrum-Mumbai route is 813 passengers *(Refer Annexure 1, Table nos. 1 & 2)*. From cost point of view though, it would not offer any benefits / savings vis-à-vis rail transport *(Refer Annexure 1, calculations in Table nos. 3 & 4)*. Rather the minimum incremental cost of coastal movement will be above ₹ 1,225/- per person per trip along the Mumbai-Ernakulam-Mumbai route and above ₹ 1,750/- per person per trip along the Mumbai-Trivandrum-Mumbai route. Unless the coastal service provides extra value, it is highly unlikely that people will opt for this mode.

Due to considerably high incremental cost involved in long distance travel, passengers would prefer air or rail travel vis-à-vis coastal movement, thereby rendering this option infeasible.

5.2 Short distance passengers travelling within Kerala

As regards to passenger movement within the state, the shift to coastal mode will be have maximum likelihood when both points of the O-D pair fall along the coastal stretch. Again, a port facility in the vicinity is a pre-requisite for such coastal movement. Currently a port already exists at Cochin (Ernakulam) and new ports have been planned at Azhikkal (Kannur), Beypore (Kozhikode), Thankassery (Kollam), and Vizhinjam (Trivandrum). For the reason stated above, the analysis of passenger traffic within the state has been confined only to these coastal districts.

Step 1: Determining the inter-district distances & number of buses plying along each O-D pair

A distance chart showing the optimum road distances between different sets of O-D pairs was developed. The number of buses has been derived considering the number of AC & Deluxe buses being operated by KSRTC and private travel companies. KSRTC has a total of 126 AC & deluxe buses being operated in Kerala. It is learnt that 75 per cent of these buses ply between the five cities namely, Kannur, Kozhikode, Ernakulam, Kollam and Trivandrum. Further, KSRTC passenger operations account for 12 per cent of total passenger traffic in the State. Accordingly, the total number of buses being operated across the five cities comes to 788. In absence of exact data, these buses were divided among the O-D pairs based on distance between the origin city and destination city. The distance between the select pairs of cities is shown in table below:

Table 5-4: Distance chart for select O-D pairs

Distance Chart (kms)	Kannur	Kozhikode	Ernakulam	Kollam	Thiruvananthapuram
Kannur					
Kozhikode	93				
Ernakulam	284	190			
Kollam	427	333	144		
Thiruvananthapuram	494	400	211	67	

Based on the above table, the number of routes falling in each distance slab was calculated. Accordingly, the number of buses in each slab was divided by number of routes to arrive at number of buses per route, which is shown in table below.

Table 5-5: Distance-wise number of buses

Distance (kms)		% of buses	Total no. of buses	No. of routes	No. of bus per route
From	To				
0	100	20%	158	2	79
101	200	30%	236	2	118

Distance (kms)		% of buses	Total no. of buses	No. of routes	No. of bus per route
From	To				
201	300	30%	236	2	118
301	400	10%	79	1	79
401	500	10%	79	3	26
501	above	0%	0		
Total			788		

Based on the above table, the number of buses between each O-D pair of cities is presented in the table below.

Table 5-6: Total number of daily buses plying along the O-D pairs

No. of daily buses	Kannur	Kozhikode	Ernakulam	Kollam	Thiruvananthapuram
Kannur					
Kozhikode	79				
Ernakulam	118	118			
Kollam	26	78	118		
Thiruvananthapuram	26	26	118	78	

Step 2: Calculation of route-wise total number of weekly passengers

Based on distances, an estimate of number of passengers per bus was made for each O-D pair. These route-wise average passengers per trip were multiplied to the number of daily buses to arrive at the route-wise total number of daily passengers. The route-wise weekly passengers were further derived from these numbers.

Table 5-7: Route-wise average number of passengers per bus

No. of passengers	Kannur	Kozhikode	Ernakulam	Kollam	Thiruvananthapuram
Kannur					
Kozhikode	10				
Ernakulam	25	25			
Kollam	20	20	30		
Thiruvananthapuram	20	20	50	50	

Step 3: Calculation of average cost for road travel

Typically, road transport is the cheapest mode for shorter distances and hence not comparable with any other mode along the cost parameter. Nevertheless, an estimate of route-wise average cost incurred on road transport can be made for understanding the level of cost differential. This is done by multiplying per person per kilometre average fare with the route-wise distances.

As per inputs availed during the primary survey, for buses under consideration such average fare works out to ₹ 1.86/- per person per kilometre.

Step 4: Time (in decimal hours) for road travel

The distances between the different sets of O-D pairs are divided by an average speed of 35 kmph, assumed for road movement, so as to obtain the route-wise average travel time.

Step 5: Indicative total cost of opting for coastal transport

Movement from one point to another by the coastal mode typically comprises of two elements –

i. Inland movement from origin to port of embarkment and from port of disembarkment to final destination
ii. Coastal movement from port of embarkment to port of disembarkment

For part (i) above, the minimum road distances of respective O-D points from nearest ports are determined and multiplied by an indicative per km fare of ₹ 2/- for last mile connectivity.

For part (ii), per km fare of ₹ 3.45/- computed earlier is multiplied to the coastal distances between respective ports to obtain the fare for coastal trip.

The total cost of opting for coastal transport is, thus, a sum total of parts (i) and (ii) above.

Step 6: Likely total time (in decimal hours) for coastal movement

For the time associated with last mile journey, the respective road distances to the nearest port are divided by the average speed of 20 kmph or 30 kmph depending on whether the distance is within 10 kms or beyond 10 kms and then added up for each O-D pair individually. This time is added to the time required for coastal journey at speed of 38 knots (~70 kmph). A provision for waiting / process time to the extent of 1 hour is also required for estimating the total time required, if the coastal route is opted for.

Step 7: Likely time saving (if any) on opting for coastal movement

The likely total time for coastal movement is then compared with the total time for road travel, to identify time savings (if any).

Step 8: Expected weekly shift to coastal mode

As stated earlier, it is least likely that coastal transportation will be cost-efficient vis-à-vis other modes, unless it is subsidized by the Government. Therefore, the possibility of diversion has been derived based on the potential time savings by opting for coastal ferry services.

The following competitive advantage criterion has been employed for arriving at the weekly shift:

Table 5-8: Criterion for determining likely shift from road to coastal route

Level of Competitive Advantage	Potential Time Saving (as % of time taken for road journey)		Associated Diversion Possibility
	From	To	
Level 0	-	0	0%
Level 1	0	10	0%
Level 2	10	20	2%
Level 3	20	30	5%
Level 4	30	40	10%
Level 5	40	50	20%
Level 6	50	-	25%

The expected weekly shift is thereafter calculated by multiplying the weekly passenger number for each O-D pair with the corresponding diversion percentage as per the criterion above. In arriving at the likely shift to

Therefore, the expected weekly shift of commuters from road to coastal route works out to 9,820 passengers *(Refer Annexure 2, Table no. 1)*. However, from cost perspective, opting for coastal journey would mean incurring incremental cost varying from ₹ 168/- for Ernakulam-Kozhikode route upto a maximum of ₹ 682/- for Thiruvananthapuram-Kannur route *(Refer Annexure 2 Table no. 2)*.

At the same time, given the relatively higher time requirement for road travel owing to narrow roads and congestion, the passengers commuting between the different O-D pairs by road would not mind shelling out a premium for time saving of around 30-40%, applicable along most routes.

Accordingly, the State government or private player can consider launching a pilot initiative across select routes and thereafter extend operations to other routes, as existing service falls short with increasing traffic.

5.3 Potential of coastal tourist (cruise) traffic to Kerala

Globally cruise tourism has been growing at around 12 per cent a year, generating more than 10 million passengers and USD 14 billion a year. However, cruise tourism in India is still in its infancy stage. It has just started catching up and many are joining cruises in Singapore, Hong Kong, Mediterranean and the Caribbean. This class of people, however, constitutes a small percentage of Indians. Many haven't experienced what a cruise liner would offer. It would definitely take time to build up a positive perception of cruises in the minds of people.

Notwithstanding this, cruise services along Kerala coast represent a seemingly excellent opportunity that would dramatically change Kerala's tourism scenario. The long coastline and inland waterways / rivers are the main attractions of the state. Tourists, international as well as domestic, who have taken up such itineraries to touch locations, visit the area and then again embark on the cruise to the next point. It reduces the strain & boredom of surface transport as a cruise is less strenuous and more relaxing.

The choices of passengers would be strictly based on factors like the timings of the service, quality of the vessel, on-board services, the time taken between locations, safety measures, and the facilities along the stretch. Accessibility to the port, passenger amenities at the port points and trained personnel are all important aspects that would encourage passengers to take the cruise.

The next logical question is what could be the indicative cruise charges. As per the information obtained during primary survey, cruises that operate from Mumbai to Goa itself costs high as fuel expenses alone would work out to ₹ 3,000 per person. Though there are operators, who charge a lower amount, typically the amenities provided by them would not be upto the mark. Also, it will take around 15 hours for the 225 nautical miles journey at a speed of 15 knots.

In the past, quite a few attempts of running cruise services have failed. A full fledged coastal cruise service covering the entire length of Kerala coast was never started. But there had been serious considerations for a 'Catamaran / Hovercraft service', which did not materialize either. A regular luxury cruise organized by Louis Cruise from Cochin had to wind up operations after six weeks due to heavy charges levied by the Cochin Port. Apart from the weekly port charges, Kochi port also charges passenger fee, security cess and fee for checking and baggage examination. The cruise line had to shell out to Cochin port an amount as high as ₹ 33 lakhs per week. In case of round trip cruises, taxes are applied to on board services also for vessels operating within 12 nautical miles from the coast. Outside Kerala, the vessel Superstar Libra stationed by Genting Hong Kong Ltd in Mumbai, and the vessel MV Ocean Odyssey, operated by UK-based Cruise Line Ltd out of Mormugao port were pulled out due to poor demand, and the costs of accessing port infrastructure and services.

Cruise Industry is said to be a supply driven industry wherein if adequate facilities, services and infrastructure are provided, that will in turn attract more and more cruise operators to the Indian shores. Thus if initiatives are taken by the concerned authorities in all these respects, India as a cruise destination would stand a great potential. Another initiative that is perceived to be of importance by tourists is that of creating good destinations at the ports of call.

The foreign tourists are mostly unaware of the Indian coastal and river cruises with the exception of Kerala backwater cruise. This calls for concerted efforts towards positioning and marketing by cruise liners. If Kerala can develop infrastructure, get vessels to operate, streamline and manage cruise operations control, design services knowing the needs of the passengers and keep the costs and taxes within an appreciable limit, there could be a higher possibility for such services.

5.4 Bottlenecks in coastal passenger movement

The milieu for coastal passenger movement in India is far grimmer, than is apparent. This can be attributed to several factors as under:

1. Historically, lack of administrative will has triggered a situation of underdeveloped infrastructure. The Union Cabinet had approved a cruise shipping policy in July 2008 exempting operators from income tax, excise duty, customs duty, corporate tax and service tax, but it has not been implemented yet.

2. An attempt to incorporate world class standards is less likely to be successful in the Indian context, given that the speed-crafts like hovercrafts, catamarans, or hydrofoils have to operate in the close proximity of coasts & the Indian coastline is highly polluted. The filth in the waters is likely to get entangled in the propeller blades very frequently, thereby requiring expensive repairs and downtime which, in turn, will have a bearing on operating costs & schedules. Again, speed crafts are usually associated with a perception of swayful rides, which are likely to cause nauseatic feeling amongst many. This, in a way, discourages people from opting for sea transport.

3. Traditionally, Indian customer is known to be cost conscious and hence doesn't consider sea transportation as fun or relaxation from the routine, unlike in the affluent societies. Many of the commuters may not be willing to shell out extra money for coastal ferry services.

4. All existing modes of passenger transportation in India are subsidized. Lease amounts (if any), maintenance cost, overheads, fuel cost, operational cost, taxes, port charges, cost of finer passenger services, and promotional expenditure all would make it expensive for the vessels. Unless subsidized, the costs will be very high and may force the operator to shut down operations. Damania Shipping once ran a high speed catamaran (20-30 knots per hr) service between Mumbai and Goa. It is believed to have suffered losses & was shut down within 2 years of operation. Another example of non-viability of operations is the Triton – operated hovercraft service between Belapur & Gateway of India, which had an indicative speed of 40 knots.

5. For long distances, where travel transit passage is more than 18 hours, it is mandatory that sleeping facilities have to be provided. Provision of sleeping facility on-board would consume more space and affect the passenger capacity of the vessel, thereby adding to the cost and ultimately the individual fares. Due to absence of galley in catamarans, the food won't suffice for a longer journey.

6. Every attempt to increase the speed will step up the cost, thereby making it less affordable for travellers, unless it is targeted to the high-end segment. At the same time, any attempt to increase the passenger capacity so as to reduce per unit fare could adversely affect the speed. The reduced speed, in turn, would tend to increase the travel time and, therefore, affect the choice of transport. A right balance of optimum passenger capacity, optimum speed, adequate engine capacity, fuel consumption, and affordable fares to ensure long run viability is quite difficult a proposition to be accomplished. A ferry line operating at non-optimal capacity can result in huge losses for the operator. Therefore, the risk of running a full-fledged ferry line can't be afforded, unless a regular & steady flow of passengers is assured.

7. Speed-crafts like catamaran have limitations in terms of fuel tank capacity & will need re-fuelling at Goa while moving from Mumbai to Cochin. This is likely to consume additional time.

8. Time factor is the most important aspect in this operation, be it for tourism or for general operations. Time factor plays a vital role in operations, completing projects, starting port services and procuring vessels. Unless all these happen in precision, the lag would affect the project.

5.5 Inference

Based on the findings and analysis on likely passenger shift from road to coastal route, the State Government or private player can run a pilot project with just 1-2 catamarans to begin with for intra-state movement between coastal districts. The initial choice of route(s) should ideally be such that it strikes a right balance between the time saving and incremental cost. This should, however, be preceded by adequate marketing efforts such as road shows, stakeholder workshops, etc. to educate the target passenger segment about the offerings of coastal movement and the proposed speed craft. If the pilot project turns out to be successful, the operations can be further expanded to other routes in a phased manner.

6 Infrastructure

Based on the O-D cost economics, the coastal traffic potential for the next one decade has been arrived at for each of the port locations in chapter titled 'Traffic Potential'. These locations (as indicated in the earlier chapter) have been firmed up primarily by the hinterland coverage associated with the particular port location.

To cater to the forecasted traffic, it is imperative to establish a certain level of infrastructure. Accordingly this chapter provides a broad overview of the existing infrastructure in place and the additional development that might be required for achieving the envisaged coastal cargo for the ports at Azhikkal, Beypore and Kollam.

6.1 Azhikkal

6.1.1 Background

Azhikkal is a riverine port located at the confluence of Valapattanam River and Mattol River with the Lakshadweep Sea in Kannur district of Kerala. At present, Azhikkal is a small harbour located at 11° 56' 38" N latitude and 75° 18' 36" E longitude. Situated between the major ports of New Mangalore and Cochin port, it is on the northern Malabar Coast and is around 130 km south of New Mangalore port. Kannur town is just 10 km from the port site which can serve as a port town providing all supporting urban infrastructure. Kozhikode town is only 80 km south of the Azhikkal port.

6.1.2 Connectivity

6.1.2.1 Road

NH 17 is a major highway that connects Mumbai via Panvel–Goa–Karnataka to Kerala. Running near the western coast in Kerala, it is a 2 lane road which runs from north to south on the Malabar Coast passing through Kasargod, Kannur, Kozhikode up to Trivandrum, covering the primary hinterland of Azhikkal port. The NH 17 passes through Kannur town and the nearest stretch of the highway is at a distance of 2 km from the port site. The NH 17 connects Kannur to Kasargod and Mangalore in the north and Calicut (Kozhikode) and Cochin (Kochi) in the south. It is important to convert NH 17 into a 4 lane highway in order to ensure seamless movement of cargo. Connecting the NH 17 at Kozhikode south of Kannur is the N H 212 Kozhikode–Muthanga (Wayanad) also called Kozhikode–Mysore highway, which is a 117 km single lane route with about 17 km passing through forest land between Kozhikode and Muthanga in Wayanad district of Kerala.

6.1.2.2 Rail

The Konkan railway connecting Mumbai-Ratnagiri-Goa-Managalore-Kochi-Trivandrum passes through Kannur. The distance from the Azhikkal port office to the nearest BG rail line is only 2 kilometres. Kannur is connected to the rail link between Mangalore and Trivandrum which extends up to Mumbai, Delhi & Chandigarh; however most of the route is on a single track which limits the capacity to run additional trains.

6.1.2.3 Inland water way

Azhikkal port is connected with Valapattanam River, which forms part of state waterways. In addition potential exists for development of inland waterway connecting Hosdurg in Kasargod district with Poovar, near Thrivananthapuram in the south, which has a length of 560 km. The development of waterway will help in de-congesting the road traffic through NH 17.

6.1.3 Existing infrastructure

Port office is located on the southern bank of Valapattanam River, closer to the Western India Plywood Factory. There is an old wharf just in front of the port office (measuring 37 m in length by 20 m breadth). The depth near the wharf is only 2m but the channel depth is 6m near the berth. A new wharf is being developed and is almost complete. It is being constructed adjacent and to the west of old wharf. At present, the port does not have any equipments of its own. According to port officials, mobile cranes had been hired in the past to move bulky cargo at the port.

The availability of land with the Department of Ports as on date is given below:

1. Reclaimed land near the Azhikkal breakwater is 85.7 acres (52.3+15.8+17.6)
2. Land near port office is 1.84 acres (100+ 84 cents)
3. Reclaimed land near Mattol is 60.91 acres
4. Another 4 acres are under acquisition by the Govt. of Kerala near the new wharf being constructed (close proximity to the Port Office and to the left of abandoned berth.)

In total, the land available with the Government of Kerala at present is 152.45 acres. This land is readily available for port development

6.1.4 Additional infrastructure requirement for coastal shipping

The coastal traffic anticipated to be handled by Azhikkal by the end of 2020 is to the tune of around 1.63 million tonnes. Considering the low draft available, to allow direct berthing of vessel would entail high dredging cost (both capital and annual maintenance cost). Accordingly instead of the direct berthing facility, initially Azhikkal can be developed as a fair weather lighterage port. Later on, as the cargo volumes increase, the facilities can be augmented for all-weather direct berthing facilities. Although, Lighterage operations would be costlier by Rs. 50/- to Rs. 60/- per tonne compared to direct berthing, Lighterage operations are preferred for following reasons:

- The capital cost owing to cost of capital dredging and increased operational cost of maintenance dredging would offset the extra cost of Lighterage operations.
- The development of Lighterage facility involves low risk and the implementation could be done with certainty & in lesser time.
- In the last few years, Lighterage ports / berths have been successfully developed at many places on west coast of India handling 3 to 5 million tonnes of cargo per year. For example, Redi port in Maharashtra is being operated successfully as a Fair Weather Lighterage port.
- Further, the proposed Lighterage operations using 3000-4000 DWT barges could be started with minimal investment as this option obviates the requirement for deep dredging. In other words, the huge capital and maintenance dredging costs on account of having an otherwise direct berthing facility is pre empted here. This obviously becomes a selling point for Azhikkal port and this minimises the risk for prospective port developers (if the government wants to be develop the same under PPP basis) who can start operations with less investment and a relatively short gestation period
- The above business model also provides sufficient time for the port developer(s) to test waters (by commencing operations with minimal investment) and ramp up capacities later based on the then prevailing circumstances. This provides the port developers a leeway in terms of port planning.

The maximum ship size that can be allowed to enter Azhikkal port depends on the maximum allowable width and the depth of entrance channel. The two parallel breakwaters exist at 370 m apart at Azhikkal. Since lighterage operation is proposed for coastal shipping barges of 3000 to 4000 DWT can be deployed. The dimensions of vessels / barges that can be deployed for lighterage operations are as given below:

Table 6-1: Vessel dimension that can be deployed

Specifications	Range (Dimensions) in meters
Length	120
Beam	18
Draught	3.8
Depth	5

The Azhikkal port is being proposed to be developed in the creek portion of Valapattanam River, total tranquillity condition exists throughout the creek except near the entrance where due to wave influence, some disturbance would be expected mainly during monsoon. In fair weather, near tranquillity conditions can be considered. The cargo handling equipments considered is conventional mobile grab cranes or poclains with or without conveyors. The material handling equipment would vary depending on the type of cargo. To cater to both bulk and general cargo, two multi-purpose terminals have been envisaged having a capacity of 1.0-1.2 million tonnes per annum. The operational specifications and the broad cost estimates has been indicated below -

Table 6-2: Operational specifications - Azhikkal

S. No.	Attributes	Detailed specifications
1	Size of berth	Length 135 m Breadth 20 m
2	Size of barges	Length 120 m Beam 18 m Depth 5 m Draught 3.8 m
3	Distance of anchorage from berth	5 to 6 nautical miles
4	No. of trips per barge in 24 hours	2 to 3 trips
5	No. of 3,000 to 4,000 DWT barges for Lighterage operations for 24 hours operations	2 nos. (Plus 1 as standby)
6	Rate of loading / unloading at berth for 24 hour operations	8000 metric tonnes
7	No. of hours at berth for barges in 24 hours	15 to 18 hours
8	Average no. of days in a month	20 to 25 days
9	Average no. of days operations in a year	160 to 200 days
10	Total capacity of a berth per year	1.0 - 1.2 million tonnes

No dredging is foreseen in the initial years, though some provision is made in the project cost towards capital dredging. Depth available in front of berths varies from -4.00m to -6.00m. The depth required is -3.20m to - 4.00m as per vessel size considered and therefore, no dredging is foreseen except removal of few shallow patches, if needed, based on confirmatory bathymetric survey.

However, to provide any future need for deepening in front of berths, the design dredged bed level for all berths is considered as -12.00m CD. The broad cost estimates for two multi-purpose terminals (having a capacity of 1.0-1.2 million tonnes) has been indicated below -

Broad Cost Estimates

Description	Broad Cost Estimates (Rs. Million)
Land	3.60
Surveys	1.85
Site Development	110.30
Marine Structures (Cargo Berths , Fixtures & Fittings)	421.80
Access To Port Area	8.00
Buildings	11.49
Water	2.10
Fire Fighting	1.90
Surface Water & Drainage	1.30
Environmental Considerations	1.50
Material Handling Equipments / Transport Vehicles	58.58
Electrification	18.10
Communication	1.20
Dredging (Provisional) + Navigational Aids	5.00
Tugs & Other Floating Craft	
Storage Yards	5.40
Engineering	98.00
Total Estimated Project Cost	750.12

6.2 Beypore port

6.2.1 Background

Beypore Port (lat 11˚08"N & long 75˚51"E) is located midway between Kochi and New Mangalore. It is situated at the mouth of Beypore/Chaliyar River discharging to Arabian Sea. Beypore has some port facilities in terms of berthing wharves where small vessels (mostly barges) operate. The traffic from mainland operates to and from Lakshadweep Islands. Beypore is the second biggest port in Kerala after Kochi handling about 100,000 tonnes of cargo and 7,500 passengers per annum.

6.2.2 Connectivity

Kozhikode is situated along the NH17 and Beypore is 10 Km down south of Kozhikode connected through Beypore Road. Beypore is also connected to NH17 at Cheruvanoor (about 4.5 km).The nearest major railway station is Kozhikode.

6.2.3 Existing infrastructure

At present Beypore has two wharves and other minimal infrastructure facilities like storage sheds, cranes and tugs. The port has a depth of about 4 meters alongside wharf and approach channel. The following facilities exist on the Northern Bank of Beypore River

Description	Specifications
3 – 3.5 m harbour area	Entrance (river mouths) Protected by Northern & Southern Breakwaters
Wharfs	300 m Alongside depth 3 to 4 m
Wharf Cranes	1 x 5T and 4 x 3T
Mobile crane	1 x 20 T
FLT	1 x 2 T
Godown	2 Nos. of 300 Sq m
Tugs	3 small numbers
Generator	1 No. 500 KVA 1 No. 160 KVA
Transformer	1 No. 630 KVA
Road Access	Beypore Road connects the Port to Kozhikode

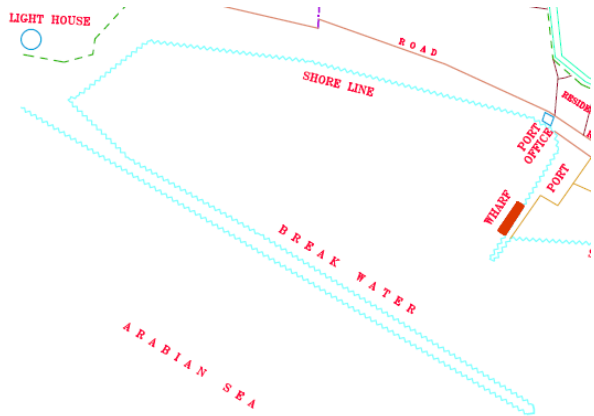
The existing new wharf which is proposed to be re-furnished could be used for handling general cargo and containers and the old wharf for Break Bulk cargo. The berths are contiguous to the land so that the operational area is not restricted. It is indicated that the wharf (berth) is designed for deck loading of 5T/M2 and it can berth vessels upto 10,000DWT.

6.2.4 Additional infrastructure requirement for coastal shipping

The existing berths can be strengthened for handling of the cargo (broad cost estimated to the tune of around Rs. 6 Crores). In the event the cargo exceeds the actual capacity of the berths, an additional berth can be developed to cater to the envisaged coastal cargo volume.

6.3 Kollam

6.3.1 Background



The Kollam port location is situated at a latitude of 8° 52' 35" N and longitude of 76° 34' E in Kollam District about 70 km north of Thiruvananthapuram and 150 km south of Kochi. There are two breakwater structures to facilitate port operations. The port is also equipped with a 144 ft. light house built in 1902. The Port is outside the normal path of the tropical cyclones and hence a "Safe Port". There has been no history of "anchor dragging" even in foul weather.

Figure 6-1 : Overview of the Kollam Port area

6.3.2 Connectivity

6.3.2.1 Roads

The Kollam district is well connected to other parts of Kerala and India through the NH-47, NH-220 and NH-208. The National Highway 47 covers a distance of 57.4 km in the district and is only 2kms from the Thankassery port. The National Highways NH-208 (Kollam - Shencottai) and NH 220 (Kollam - Theni) originate from Kollam.

Figure 6-2 : Kollam district road network

Source: Maps of India

The State Highways namely, Main Central Road, Kollam-Shencottah Road and Punalur-Pala-Muvattupuzha (Main Eastern Highway) with a total length of 266.52 kms also network the district. The double-lane coastal road from Thankassery to Vadi is in progress and shall run parallel to the sea shore.

In terms of the connectivity with the Thankassery port, the following four options exists –

1. From Port gate to Althnamoodu junction and which goes to Cochin
2. From Port gate to Beach and then to Trivandrum. From the beach, there is a road proposal coming up, the road is proposed as part of the coastal road connectivity.
3. From Port gate via Kochuplamoodu junction and then to Police camp. From the Police camp Jn to NH-47 to Trivandrum.
4. From Port gate to Kochuplamoodu junction to Chinnakada round about (which is the Main city centre for Kollam). The road will be for Trivandrum / Cochin and Tamil Nadu via Thankasei

6.3.2.2 Rail

Figure 6-3 : Kollam district rail network

Source: Maps of India

Kollam is an important railhead of the Southern Railways. The Kollam railway station is considered to be one of the biggest railway stations in Kerala state after Shornur and Palakkad junctions. The district is covered by 132 km of railway tracks, of which 51 km are broad gauge and 81 km metre gauge.

The Trivandrum-Ernakulam line, which goes via Kottayam and Alappuzha, passes through Kollam. Kollam is the terminal junction of Madras-Egmore-Kollam metre gauge line.

The metre gauge track is being converted to broad gauge under project Unigauge and is presently closed. The new BG line is expected to open during the year. As regards the Thankassery port, the shortest distance between Railway lane and shoreline is 1 Km. However there are lot of buildings and no vacant land.

6.3.2.3 Inland waterways

Kollam is well-connected through waterways with other parts of Kerala and this stands to the advantage of the Thankassery port. The Centre has declared the Kollam-Kottapuram stretch of West Coast Canal, along with Champakara and Udyogmandal Canals (205 km) in Kerala, as National Waterway No 3 (NW3). The extension of the NW3 to Kovalam and further to Colachel is under its active consideration. The National Waterway standard will require acquisition of land to widen the canal at some places and dredging and rehabilitation of cross structures like bridges.

6.3.3 Existing infrastructure

The total land available in the port complex is around 42,400 sq.m. (10.6 acres), which has been used for various utilities. The existing facilities at Kollam port include a wharf, breakwaters, godowns, storage yards and other port infrastructure like barges, forklift, tug, etc. The wharf is 177 meters long, 12 meters in width. The wharf has available draft of 6.30 m but the berth structure is designed for a draft of 10.00 m after dredging. The wharf is protected from wave effect by seaward breakwater of 2100 m long and leeward breakwater of 500 m long

At present the depths available at wharfs and inside the harbour are about -6.5 m to -7.0 m, which will allow vessels having draft upto 5.5 to 6 m to operate in the harbour. This will allow vessels of size 6,000 to 7,000 dwt to berth at all tides. The entrance channel is 350 meters wide. The basin area is approximately 100 hectares, with depth which varies between 4 meters to 10 meters. The port area also includes two godowns of 1450 sq.mts. each, a concrete yard with an area of 16000 sq.mts and a 3 acre yard. Additionally a water tank, and ground level sump has also been developed for water supply.

6.3.4 Additional infrastructure requirement

The state government has already undertaken a bulk of the port development and to commence the full-fledged commercial operations of coastal cargo at Kollam port, the following augmentation to the existing infrastructure would be required viz-

- Providing mechanical material handling equipment / cranes etc
- Strengthening existing facilities
- Facilitating connectivity (with active support of the state government)

As per details made available, the wharf structure is designed for a uniformly distributed load of 3.50 tonne per square meter and no other loading has been considered towards material handling cranes / equipments operating on the wharf deck. As the deck is not designed for these crane loads, it has been proposed to increase the deck slab thickness of entire wharf deck, with extension by about 8.00 m towards land. The increase in vertical loads on piles will be marginal and within the safe capacity of pile. The capacity of existing wharf including extension with above strengthening would be utilized to the maximum extent possible.

The installed capacity of wharf with the above strengthening would be around 3.60 million tonnes per annum and actual capacity utilized would be 2.7 million tonnes per annum with operating efficiency of 75%. Accordingly after the strengthening of the wharf, the existing wharf itself would be sufficient enough to cater to the forecasted coastal cargo traffic of around 1.88 million tonnes.

To economize on the cost, the equipments for cargo handling can be considered common for multi-purpose which would be deployed for both general cargo, bulk cargo and containerized cargo in the form of mobile cranes or fixed cranes of 20 tonnes capacity with a radius of about 20 m.

For evacuation of cargo, one of the possibility is through the Port gate via Kochuplamoodu junction and then to Police camp situated at a distance of around 2.5 km from port gate. Through this road, freight can be transported via NH 47 to Thiruvananthapuram without touching Kollam City traffic. Harbour Engineering Department have initiated work in the above mentioned route including proposed acquisition of 1 acre of land near proposed Kochuplamoodu bridge for easy access of trucks from port road to the proposed bridge.

The broad cost estimates for the additional infrastructure requirement for catering to the envisaged coastal cargo at Kollam is indicated below

Description	Broad Cost Estimates (Rs. Million)
Land	0.00
Surveys	0.60
Site Development	76.00
Marine Structures (Strengthening of Existing Wharf)	37.60
Access to Port Area	4.60
Buildings	8.00
Water	0.00
Fire Fighting	1.60
Surface Water & Drainage	0.60
Environmental Considerations	1.20
Mechanical - Material Handling Equipment	200.00
Vehicles (through Sub-Contract)	
Electrification & Instrumentation	20.00
Communication	0.50
Dredging	0.00
Tugs & Other Floating Craft (through Sub-Contract)	
Engineering Professional Fees	10.50
Misc. Costs & Contingencies	38.80
Total Estimated Project Cost (Rs. Million)	400.00

6.4 Alappuzha

6.4.1 Background

As outlined in the chapter titled 'Traffic Forecast', the State Government should plan for creation of an alternative port to Cochin port, specifically catering to coastal cargo. Alappuzha has been considered for this purpose, as the Government has plans to develop a cargo harbor at Alappuzha. The proposed

project site at Alappuzha is situated at a latitude of 9^{o} 30' N and a longitude of 76^{o} 19' E in the state of Kerala. The adjacent district headquarters are Ernakulam (Cochin, 50 km to the North), Kottayam (40 kms to the East) and Kollam (85 kms to the South). Towards the land side of the project site, there are network of canals included in the west coast canal system which are used for navigation

6.4.2 Connectivity

6.4.2.1 Roads

The National highway (NH-47) is just half a kilometer away from the proposed project location. A by-pass connection is being developed on the Southern end of the beach road (adjacent to the proposed project site) to NH-47

6.4.2.2 Rails

There are two railway lines in the Alappuzha district viz Kayamkulam - Ernakulam (via Chengannur) of length 35.70 km and Kayamkulam - Ernakulam (via Alappuzha) , which is a coastal railway of length 88.18 km. The later broad gauge railway line passes just at a distance of 100 m from the proposed project location. In addition, the Alappuzha railway station is also located within a proximity of 1 km from the project location

6.4.2.3 Inland waterways

Alappuzha has a large network of inland canals and hence is the ideal headquarters for backwater tourism. Passenger services are available between Alappuzha to the following locations –

- Cherthala
- Kottayam
- Nedumudi
- Krishnapuram (Kavalam)
- Kidangara
- Pulinkunnu
- Quilon
- Edathua

There is no through fare or direct service between Alappuzha and Cochin by backwaters.

6.4.3 Existing facilities

The main land available with the port is what exists in the beach. The beach is 1500 m in length and 100 meters in width (15,000 sq.meter) around 4 acres. Apart from the beach, there are some parts of land adjacent to the beach road that lies under the purview of the Port. These include -

- Port office and signal station
- The small triangular patch of area adjacent to the Bank Road
- The godown and the workshop area

6.4.4 Additional infrastructure requirement for coastal shipping

Alappuzha port location can be developed exclusively for coastal shipping and as an alternative for Kochi port for the nearby hinterland. Since the port is to be developed on Greenfield basis, apart from developing berths for cargo and passenger, it would also entail developing break-water for maintaining tranquility, trestle, etc.

The indicative broad cost estimates of developing such a cargo harbor and passenger facilities would be around ₹ 299.50 cr.

6.5 Provisions of passenger berth

Based on the estimated number of passengers utilizing coastal route for movement within Kerala, the maximum number of passengers / commuters expected is at Trivandrum and Cochin. Accordingly a passenger berth may be developed at a suitable location in Trivandrum for the embarkment and dis-embarkment of passengers. Cochin has an existing passenger jetty at Marina Bay (opposite Cochin Marina) and can be used initially. As the passenger movements through coastal route increases, a new dedicated passenger berth can be developed. Similarly for the other identified ports, which does not have a passenger jetty, provisions for passenger embarkment / dis-embarkment can be made.

Location	Berths required
Azhikkal	One passenger jetty
Beypore	One passenger jetty
Kollam	Cargo wharf can double up as a passenger jetty
Cochin / Alappuzha	Cochin has an existing passenger jetty at Marina Bay (opp Cochin Marina) and can be used initially. As the passenger movements through coastal route increases, a new dedicated passenger berth can be developed.
Trivandrum	Passenger berth should be developed at a suitable location in Trivandrum for the embarkment and dis-embarkment of passengers

7 Coastal fleet

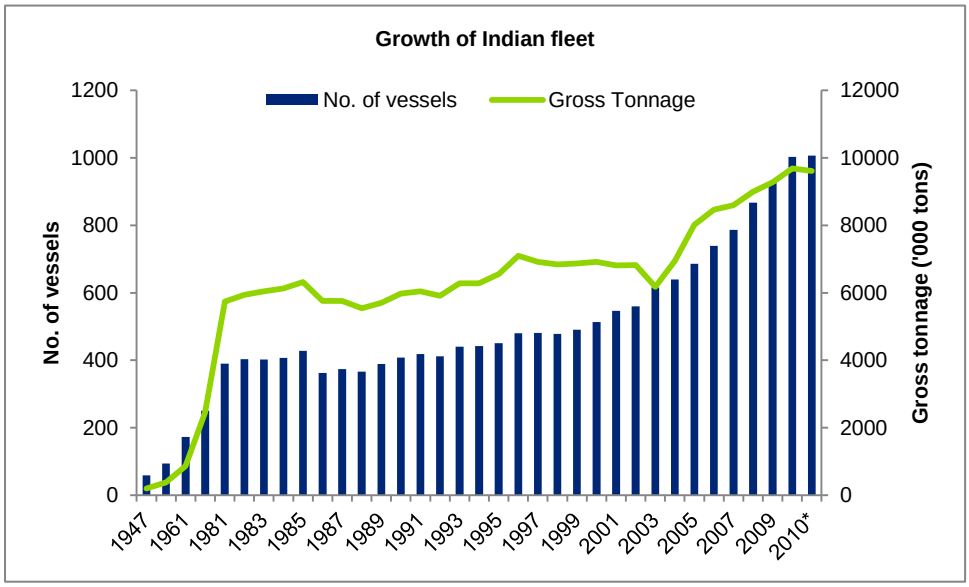
This chapter provides details on the fleet scenario and its growth in India. The findings are organized under below mentioned headings:

i. Fleet in India
ii. Coastal fleet growth in India
iii. Profile of coastal fleet

7.1 Fleet in India

India has one of the largest merchant shipping fleet among the developing countries and is ranked 20th in the world. Fleet of Shipping Corporation of India accounts for more than 32% share of Indian tonnage. Average age of the Indian vessel is more than 15 years.Figure 7-1 shows the growth of Indian fleet until June 2010 since Independence. The total number of vessels in the fleet increased to 1,050 as on 31st Jan 2011. This includes 702 coastal vessels and 348 overseas vessels.

Figure 7-1: Growth of Indian fleet



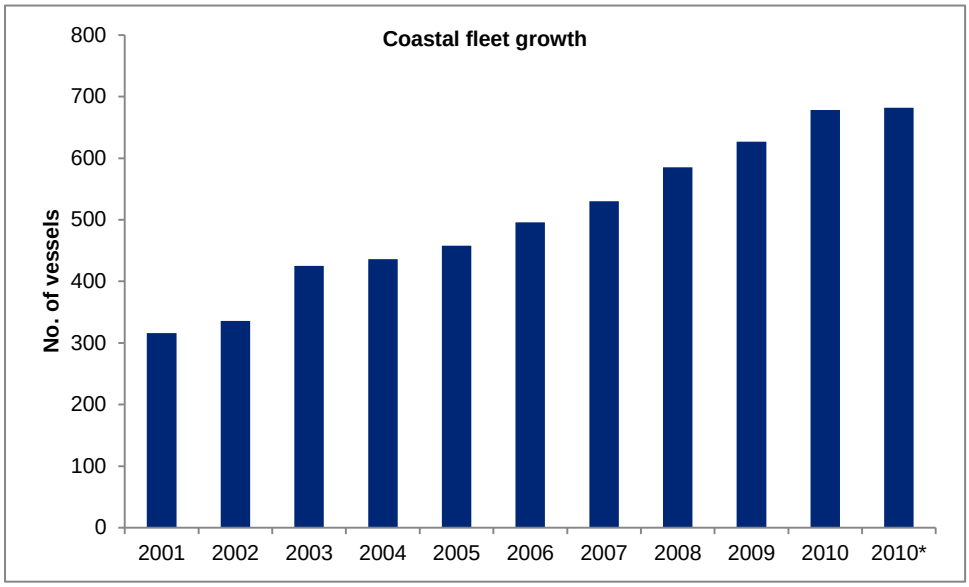
Source: Ministry of Shipping

7.2 Coastal fleet growth in India

7.2.1 Vessels

The growth of fleet during past 10 years has been shown in Figure 7-2. The number of coastal vessels has been more than doubled during last 10 years.

Figure 7-2: Growth of Indian coastal fleet



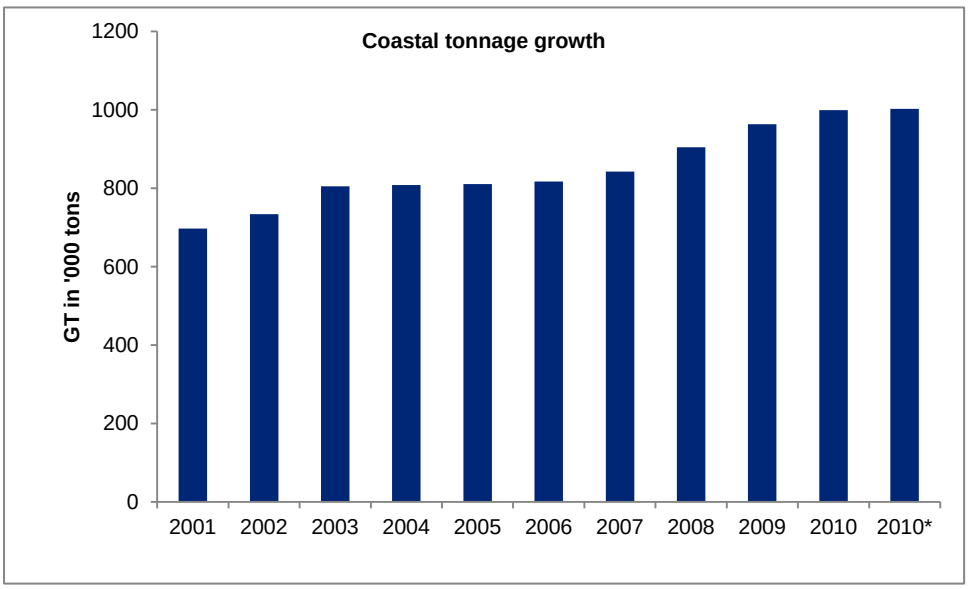
* As on 30 Jun 2010

Source: Ministry of Shipping

7.2.2 Tonnage

The aggregate Gross Tonnage (GT) of coastal fleet touched 1 million mark in the year 2010. As on 31st January 2011, the GT stood at 10,13,682 tons. This is around 10% of total tonnage of Indian fleet. The growth of tonnage is depicted in Figure 7-3.

Figure 7-3: Coastal tonnage growth

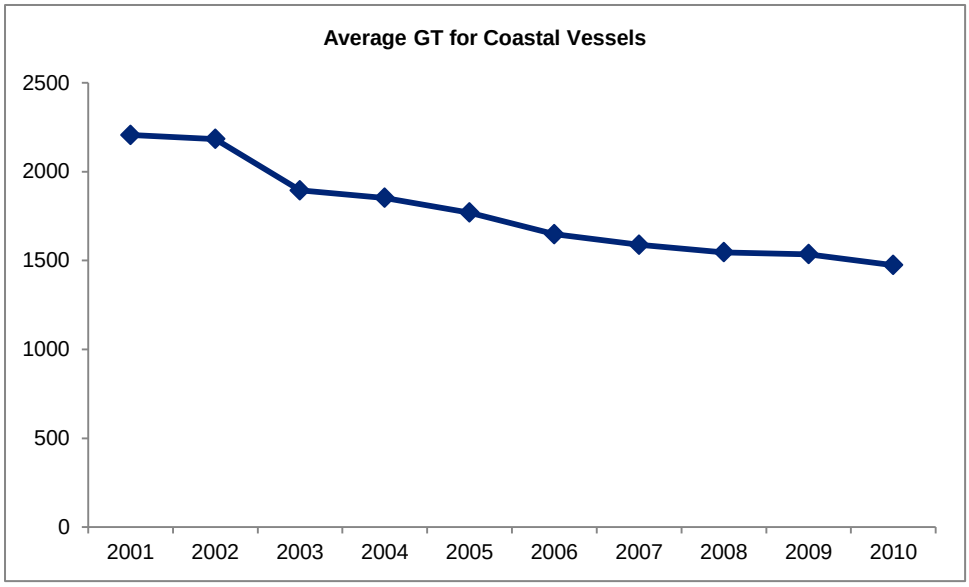


* As on 30 Jun 2010

Source: Ministry of Shipping

While the number of coastal vessels have doubled over the last 10 years, the GT has registered a compounded 43% growth over the same period. As a result, the average GT for coastal vessels has decreased over the years. The same is shown in Figure 7-4.

Figure 7-4: Average GT for coastal vessels



Source: Deloitte analysis

7.3 Profile of coastal fleet

The composition of coastal fleet is presented in Table. Major chunk of coastal fleet consists of tugs and offshore supply vessels. Commercial cargo carriers account for smaller share in the fleet.

Table 7-1: Composition of coastal fleet (As on 30 June 2010)

Type of Vessel	No. of Vessel	GT	DWT
Dry Cargo Liner	71	121843	177836
Tug	228	68361	23140
Dry Cargo Bulk Carriers	12	237220	364928
Tankers (Product Carriers)	13	40035	43226
Tankers (Crude Oil Carriers)	2	50080	82246
Passenger-Cum-Cargo	31	86173	27232
Passenger Services	52	16473	1930
Ethylene Gas Carriers	3	8727	6558
Ro-Ro	1	956	1386
Dredgers	28	121893	76152
Offshore Supply Vessels	110	117679	133896
Specialized Vessels for Offshore Services	38	88201	50480
Port Trusts & Maritime Boards	93	45199	15702
Total (Vessels) Coastal Trade	682	1002840	1004712

Source: Ministry of Shipping

8 IWT and its integration

Inland waterways are naturally available resources, in forms of rivers and canals. These waterways can be utilized for transportation of goods as well as passengers. This chapter discusses the possibility of integrating the coastal shipping and IWT in Kerala, while also presenting the current scenario of Inland Water Transportation (IWT). The discussion is organized under following headings:

i. Inland waterways
ii. Inland waterways in India
iii. National waterways in Kerala
iv. State waterways in Kerala
v. Possibility of integration with coastal shipping
vi. Development of inland waterways
vii. Conclusion

8.1 Inland waterways

8.1.1 Advantages of IWT

Advantages of inland water transportation are manifold. Similar to coastal shipping, IWT has following advantages over the road and rail transportation:

i. Energy efficient
ii. Fuel efficient
iii. Environment-friendly
iv. Suitable for moving over-dimensional and hazardous cargo

Table 8-1: Efficient movement by IWT

Mode	Road	Rail	IWT
Energy usage (movement kg. per unit HP)	150	500	4000
Fuel consumption (ton-km. per litre)	24	85	105

Source: Inland Waterways Authority of India

8.1.2 Components of IWT

To make the inland waterways useful for transportation following components need to be developed:

i. Navigable facilities
ii. Transportation facilities
iii. Terminal facilities
iv. Last mile connectivity

Development of each of these components is essential for effective utilization of waterways and attracting large number of shippers to move cargo by inland waterways. The following sections discuss these components.

8.1.2.1 Navigational facilities

8.1.2.1.1 Channel

A navigable channel with proper depth and width which can allow smooth movement of barges through the waterways is the foremost requirement. IWAI standard is to have 2 meters draft available throughout the waterways, which will allow a barge with 1.8 meters draft to operate. The waterways width prescribed is 32 meters on closed channels and 38 meters on open channels.

8.1.2.1.2 Navigational aids

Channel should be equipped with navigational aids for safe and easy navigation. These aids include:

i. River notices and navigational charts
ii. Navigational marks on the waterways
iii. Night navigation system

8.1.2.2 Transportation facilities

Inland vessels / barges are required to move the goods and passengers through inland waterways. Additionally, vessels are also required for the purpose of dredging, inspection and monitoring of the work.

8.1.2.3 Terminal facilities

Throughout the waterways terminal facilities are required at appropriate intervals. The required facilities at such terminals include:

i. Jetties for berthing of vessels
ii. Space for loading / unloading of cargo
iii. Handling equipments such as cranes for cargo / container movement
iv. Shed / storage area for cargo
v. Area for vehicles movement for loading / unloading of cargo
vi. Space for embarking / disembarking of passengers

8.1.2.4 Ancillary infrastructural facilities

For having effective logistics-chain, the ancillary infrastructural facilities

i. Bonded area within the terminal
ii. Infrastructure for last mile connectivity to the origin / destination in the hinterland
iii. Container Freight Stations (CFSs) or Transit Terminals at such terminals
iv. Utilities such as parking space, restrooms, etc.

8.2 Inland waterways in India

8.2.1 IWT in India

Inland Water Transportation is an inter-modal transportation for moving goods and passengers. There are 14500 km of navigable waterways in India. Out of these, about 5700 km is navigable by mechanized vessels. Share of IWT in transportation in India is far lower as compared with many other countries which have exploited the benefits of IWT.

8.2.2 Cargo movement by IWT in India

Cargo movement by IWT increased from 32 million tons in 2003-04 to 69 million tons in 2009-10. Most of the cargo movement by IWT take place in Goa and Maharashtra, which account for around 90% share of cargo traffic on IWT.

8.2.3 Inland Waterways Authority of India

National Waterways come under purview of Central Government and Inland Waterways Authority of India (IWAI), whereas other waterways are under the control of the state governments. IWAI was constituted in October 1986, for the development and regulation of inland waterways in the country and provide assistance to the

stakeholders in development of IWT.

Figure 8-1: National Waterways in India (Source: IWAI)

8.2.4 National Waterways

Currently, 5 waterways have been declared as National Waterways (NW), which are shown in Table 8-2. Figure 8-1 shows the location of these waterways on the map. Out of these National Waterways, NW 3 is located in the state of Kerala.

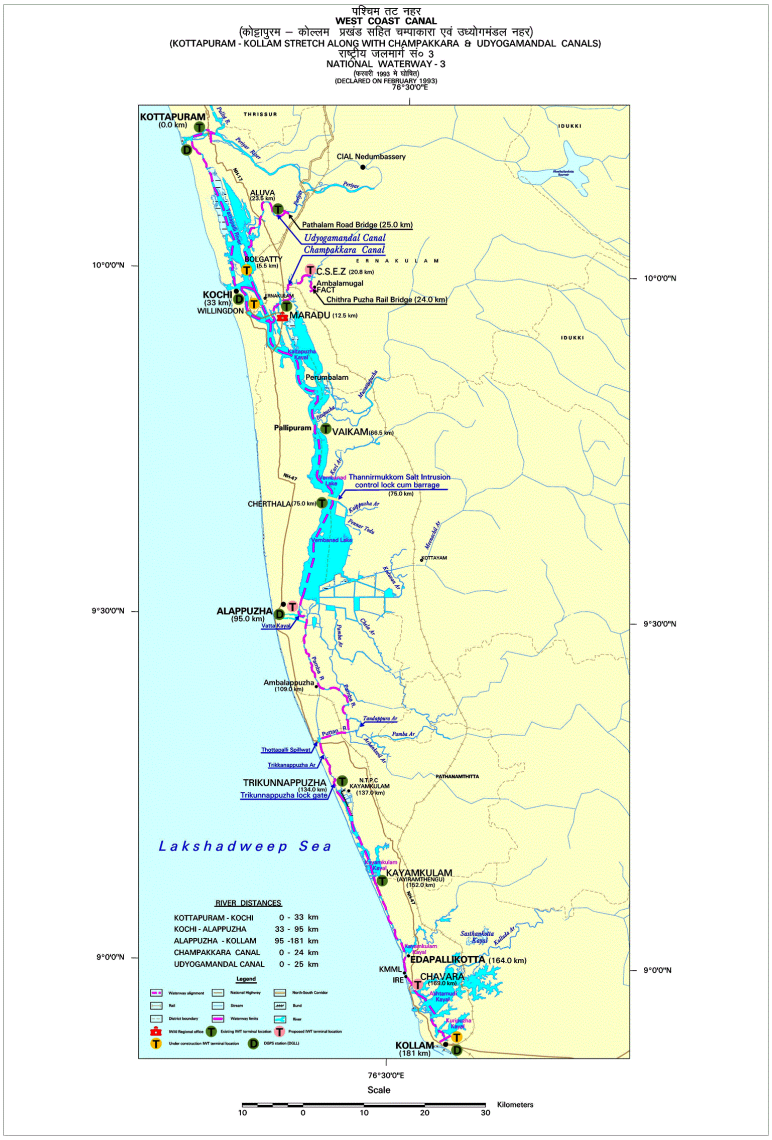
Table 8-2: Declared National Waterways

#	National Waterway	Location	Stretch (kms.)
1	NW 1	Ganga-Bhagirathi-Hooghly river system from Allahabad to Haldia	1620
2	NW 2	Brahmaputra river from Sadiya to Dhubri	891
3	NW 3	West Coast Canal from Kottappuram to Kollam along with Champakara and Udyogmandal canals	205
4	NW 4	Godavari & Krishna rivers & Canals between Kakinada and Puducherry	1095
5	NW 5	Brahmani river & Mahanadi delta system along with East Coast Canal	623

Source: Inland Waterways Authority of India

8.3 National waterways in Kerala

Kerala has good network of waterways available in the state. NW 3 covers most of the areas along the coast and connects the hinterland with Cochin port. This is shown in Figure 8-2.



8.3.1 NW 3

National Waterways 3 (NW 3) is a 205 km waterway system which consists of 168 km. channel from Kollam to Kottappuram and 37 km canals between Champakara and Udyogamandal. This waterway is mainly a tidal canal. This waterway being a national waterway comes under purview of IWAI.

8.3.1.1 Navigational facilities

IWAI has a target to provide Least Available Depth (LAD) of 2 meters on the entire waterway. However, due to some problems encountered while carrying out capital dredging, the same could not be completed. LAD of 2 meters has been provided between Kottapuram-Thakazi stretch of 121 km. Navigational charts for NW 3 have been prepared by IWAI. Day channel marks have been installed on the waterway. IWAI has installed night navigation facilities, throughout the waterway from Kottapuram to Kollam. This has led to reduction in turnaround time and increased number of cycles for vessels, particularly for movement of cargo for FACT. However, only Chamapakara and Udyogmandal Canals are being utilized for cargo transportation on the waterway, with rest of the waterway yet to see cargo movement. NW 3 is the only national waterway in India to have this kind of 24 hour navigational facilities.

8.3.1.2 Transportation facilities

There are public as well private sector companies providing transportation facilities on NW 3. These companies are mainly operating on charter basis and are involved in mainly the transportation of bulk cargo. Some of the companies include Kerala Shipping and Inland Navigation Corporation (KSINC), Lots Shipping, Choice Shipping among others.

8.3.1.3 Terminal facilities

There are a total of 11 terminals on NW 3 out of which 7 have already been developed. Details of these terminals are provided in Table 8-3. However, container / cargo handling facilities are not provided at these terminals, which becomes a bottleneck in use of the waterway.

Table 8-3: Terminals on NW 3

#	Terminal	Status
1	Kottapuram	Fixed RCC terminal constructed
2	Alluva	Fixed RCC terminal constructed
3	Kayamkulam	Fixed RCC terminal constructed
4	Viakom	Fixed RCC terminal constructed
5	Tannermukham (Cherthala)	Fixed RCC terminal constructed
6	Trikkunnapuzha	Fixed RCC terminal constructed
7	Maradu	Fixed RCC terminal constructed
8	Chhavara	To be developed
9	Alappuzha	Sanctioned
10	Kollam	Nearing completion
11	Kakkanad	To be developed

Source: Inland Waterways Authority of India

Additionally, Ro-Ro / Lo-Lo terminals have been constructed by IWAI at Bolghatty and Willingdon Islands providing connectivity to Vallarpadam. Apart from these, existing terminals owned by shippers are mentioned in Table 8-4. Bharat Petroleum Corporation Ltd. (BPCL) has developed a bunker jetty on inland waterways.

Table 8-4: Terminals owned by shippers

#	Location	Terminal Owner
1	Willingdon Islands	Fertlizers and Chemical Travancore Ltd. (FACT)
2	Ambalamugal	Fertlizers and Chemical Travancore Ltd. (FACT)
3	Eloor	Fertlizers and Chemical Travancore Ltd. (FACT)
4	Eloor	Binani Zinc
5	Edapallikota	Hindustan Petroleum Corporation Ltd. (HPCL)

Further, a port cum ICD has been set up in Kottayam district on PPP mode. This facility is connected with NW 3 and would be using inland waterways for transportation of cargo between the port and hinterland.

8.3.2 Cargo

Major cargo being moved on NW 3 includes:

- Sulphur
- Rock Phosphate
- Phosphoric Acid
- Salt
- Coal
- Zinc
- Furnace oil
- Fertilizers

The NW 3 is mainly being utilized by the FACT, as it has 3 units which all are on the banks of inland waterways. This eliminates the extra-handling of cargo and hence is effective for transportation. BPCL plans to use waterway for transportation of bunker.

8.4 State waterways in Kerala

8.4.1 State waterways network

In addition to NW 3, waterways system in Kerala include state waterways from Kovalam to Kollam (74 km.) and Kottappuram (Kadungalloor) to Neeleswaram (349 km.), a total of 423 km. This system is having feeder canals with aggregate length of 1097 km. This system connects the various points across the state and has potential to offload the burden of transportation from roads.

8.4.2 State waterways regulation

Inland Navigation Directorate situated in Kollam is the nodal agency concerned with maintaining the navigability of the inland waterways in Kerala coming under purview of the State Government. The State Government has set minimum 14 meter width and 1.5 meter depth as standard for state waterways. It also insists for a minimum 5 meter overboard clearance. However, no policy statement or documents have been issued by the Government of Kerala in this regard.

8.4.3 Missing links

The state has good network of waterways and canals from Neelaswaram to Kovalam, albeit with some missing links. To provide the waterways connectivity across the State, links as mentioned in Table 8-5 are missing on the northern side.

Table 8-5: Missing links on state waterways network

#	Missing link	Length (km.)	Status
1	Vadakara to Mahe	17.61	Land acquired
2	Mahe to Thalasseri	10.15	Land acquisition needed
3	Thalasseri to Anjarakkandi	3.47	Land acquisition needed
4	Dharmadam to Kattampally	15.75	Land acquisition needed

8.4.4 Feeder canals

The Kottayam port developed in the State is connected with NW 3. To enhance the hinterland connectivity it requires development of feeder canals on river channels which already exist. The State Government had earmarked funds for development of following canals in Kottayam.

i. Athirampuzha – Kavanar canal to Kottayam- Vaikom feeder canal
ii. Moolepadam and Karikkathara-Kotte canals at Kumarakam
iii. Ullala and Vaikom link canals in Vaikom
iv. Karunthara puzha link canal in Udayanepuram village
v. Improvements to the Achinekam link canal in Veezhoor panchayat
vi. Kodoor canal U/S of Kodimath Bridge
vii. Appuzha and Appanchira canals in Kaduthuruthy panchayat
viii. Changanacherry Muttom Canal in Changanacherry Taluk
ix. Kuttumpuram - Mudakkali link canal to NW III in Arpookkara and Neendoor Panchayat

8.5 Possibility of integration with coastal shipping

The integration of inland waterways with coastal shipping is dependent on -

i. Infrastructural linkages: connectivity of seaports with inland waterways in the State

ii. Operational aspects: Design of inland vessels being able to move / berth at the sea-ports and coastal vessels moving / berthing on inland waterways

iii. Regulatory framework: Allowing the inter-modal (sea-river-waterway) flow of the vessels

8.5.1 Infrastructural

The possibility of inland waterways connectivity at the identified ports is discussed in following sections.

8.5.1.1 Azhikkal

Azhikkal port is connected with Valapattanam River, shown in Figure 8-3, which forms part of state waterways. Connecting the 4 missing links would provide inland water connectivity to the northernmost region of the state. Hence, port at Azhikkal is having connectivity with the inland waterways.

Figure 8-3: Valapattanam River

8.5.1.2 Beypore

The port at Beypore is connected with Chaliyar River, shown in Figure 8-4. This river is connected with State Waterways. As the river is navigable, this can easily provide facilities for inland water transportation. Hence, Beypore is having connectivity with the inland waterways.

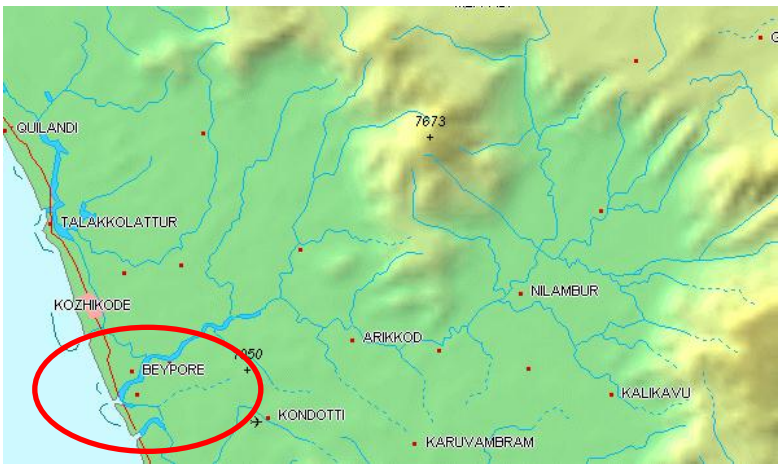


Figure 8-4: Chaliyar River and connectivity with Beypore port

8.5.1.3 Cochin

The port at Cochin is having connectivity with NW 3. IWAI has constructed two terminals, one each on Willindon and Bolghatty islands for providing connectivity to ICTT, Vallarpadam.

8.5.1.4 Kollam

Inland waterways from Kollam to Kovalam in south already exist. However, the port at Kollam is not connected with the waterways. The inland waterways and the Kollam port are 350 meters apart and hence the port can't be said to have inland waterways connectivity. An artificial link canal may be constructed for connecting the port and inland waterways. However, the area required for creation of channel is inhabited with many establishments. It is highly unlikely to move them. Therefore, establishing the connectivity seems difficult.

8.5.1.5 Vizhinjam port to Trivandrum Airport

The Government has is exploring the potential for IWT connectivity between Vizhinjam port and Trivandrum airport so as to provide alternative mode of transportation between the city and the airport.

There are two rivers, namely Killiyaar river and Karamana river, which run through the Trivandrum city and its suburbs. These rivers meet each other at Thiruvallom on a canal waterway known as Parvathi Puthanar. Thiruvallom is situated about 5 kms. north of Vizhinjam port and about 3 kms south of Trivandrum airport. These three water bodies proceed westwards to form some lagoon-like water bodies before flowing out into Arabian Sea in the West.

Due to dumping of industrial and household wastes by the entire city, Paravthi Puthanar has become narrow and shallow and is not navigable. The distance of 5 kms between Thiruvallom area and Vizhinjam port has been highly inhabited with many houses, hotels, resorts along the waterway. It would be highly difficult to acquire land for digging up a connecting waterway from Thiruvallom to Vizhinjam port area.

Another possibility of waterway connectivity is through Killiyaar river. A branch of this river flows out through Vizhinjam, at a point close to existing port area. This waterway can be further broadened for IWT connectivity, but it would affect existing Vizhinjam port infrastructure to a certain extent and may not be prudent decision. Therefore, inland waterway connectivity between Trivandrum airport and Vizhinjam port seems difficult.

8.5.2 Operational

8.5.2.1 Vessels

So far the inland vessels being designed were for solely purpose of inland waterways. Coastal vessels were designed for meant for sea-voyages between different ports in the country. These vessels could not inter-ply between the modes. With the modification in Merchant Shipping Act, a new category of River Sea Vessels has come up. These vessels can be designed in a way that the vessel can travel along the coast as well as on waterways. Therefore, the missing link in terms of vessels type is available now.

8.5.2.2 Depth

However, the availability of depth on inland waterways may not be amenable for construction of an optimum designed vessel suited for both. Therefore, the depth on waterways needs to be further increased, at least to 3.5 meters.

8.5.2.3 Terminals on waterways

The terminals established on waterways should also be capable of handling these river-sea vessels which are supposed to upgraded version of inland vessels. The berths and jetties should match the requirements for easy operations of the vessels.

8.5.3 Regulatory

With the River-Sea Vessels notification, the vessels registered under appropriate category of Merchant Shipping Act, can ply seamlessly on inland waterways and between ports in India. Therefore, the regulatory aspect has been resolved and the integration would become effective. However, the Inland Vessel Building Subsidy Scheme, in its current form would favour construction of inland vessels. Therefore, the subsidy scheme should be extended to River Sea Vessels, so that it attracts similar interest.

8.6 Development of inland waterways

While IWT has many advantages for transportation as compared to road and rail, it has not witnessed desired growth. Several issues are impeding the growth of this sector. In following sections, these issues are discussed along with possible suggestions that would drive the use of IWT in Kerala.

8.6.1 Lack of navigability on waterways

Waterways are suffering from lack of required depth, width and vertical (overboard) clearance which would allow vessels to pass through easily. It should be noted that even if any point on the stretch of waterway to be used is not navigable, the entire stretch becomes useless. Moreover, the waterways should have all-weather operations. The width of the canals vary from 9 m to 20 m. It makes movement of the barges (having width of around 9 meters) very difficult in the narrow stretches. Presence of low-lying bridges across the canals act as hindrance for the movement of vessels with cargo.

Dredging is required for providing and maintaining the depth. Widening of canals require land acquisition. The road / rail bridges constructed over the canals / waterways become hindrances in passing of a loaded barge. For example, a bridge at Kovilthottam around half a km away from Chavara towards Cochin side, posed problems for the free movement on waterway for Indian Rare Earths Limited (IREL).

While, the government has started sorting these out, the efforts have encountered some problems such as:

- How should the fishing nets be removed from the waterways, as it creates a conflict with fishermen's interests
- Widening of canals require land acquisition. However, banks of waterways are highly inhabited. It is difficult to convince the inhabitants for rehabilitation elsewhere.
- Road / rail bridges are also necessary infrastructure for social benefits.

These issues can be tackled by taking following measures:

- Field visits should be organized to address the concerns of fishermen and make them aware of the problems created by fishing nets
- The land acquisition should be done by the State government itself
- A policy should be notified making the minimum 5 meter overboard clearance mandatory while constructing new rail / road bridges over waterways.
- The policy should also prescribe minimum 14 meter width and 1.5 meter depth for all waterways in the state.
- Wherever possible, existing bridges should be redeveloped for providing the required vertical clearance.

8.6.2 Terminals development

As noted earlier in this chapter, the terminal should have properly developed facilities such as jetties for berthing of vessels, space for loading / unloading, storage area, space for vehicles movement and

parking, etc. These facilities are to be provided by the government. Apart from these, the government should encourage setting up of ancillary infrastructural facilities such as custom bonded area within the terminal, CFS, etc.

8.6.3 Cargo handling facilities

While the terminals are being developed, these are not equipped with cargo handling facilities. This is another big hurdle in use of IWT. The government plans to have such equipments installed by the user community i.e. private sector players, who are reluctant to invest. Such investments by a private party would merit only if it makes commercially viable proposition and the investor can recoup his money. As the government wants to promote IWT, it should guarantee a minimum business for the investor. This would mean that investors' commercial risks are mitigated while ensuring development of facilities.

8.6.4 Last mile connectivity: door to door services

The last mile connectivity is one of the major hurdles in switching to IWT. While, services are available for moving the cargo from one terminal to another terminal, finding a service provider for last mile connectivity is difficult and not so cost-effective. The existing service providers have to evolve an integrated logistics model wherein they take the responsibility for end-to-end movement. This would remove the multiple interfaces with different transport service providers that a shipper is subjected to. Moreover, the shipper would feel relieved and can focus on its core business.

8.6.5 Accumulation of cargo / regular services

There are no regular services for movement of cargo through IWT. Existing service providers cater to full shipload cargo on charter basis. However, entities with less than shipload, such as 1-2 TEUs, do not have the facility for moving the cargo same day by IWT. For having the full load for a barge, the shipper would have to wait for 7-10 days. This waiting time is not required in case of moving the containers by road, as the shipper can move any number of containers same day.

An option is to consolidate the cargo for multiple shippers and then send it by IWT. However, all the shippers do not buy the idea, as they are sceptical about the reliability and timely delivery.

Regular barge services between the port and inland water terminal can resolve this problem. However, an operator may lose money for providing regular barge services initially, as it would carry less than full load. Nevertheless, if shippers realize that there are reliable and regular services, they would eventually switch to IWT.

8.6.6 Dry docking

The Kerala Inland Vessels Rules requires every inland vessel to be compulsorily dry docked every 24 months. The operators in the field cited that this requirement is on higher side and similar to that for vessels registered under Merchant Shipping Act. Considering that inland vessels are not prone to rough sea and longer voyages, the rate of wear and tear would be slower. Hence, it is recommended that the compulsory dry docking may be suitably relaxed.

8.6.7 Slower mode

IWT is a slower mode of transportation with average journey speed of around 8-10 Knot (15-20 kmph). However, it should be noted that roads in Kerala suffer from congestion and the average journey speed would be no more than 25 kmph for freight movement. Considering the other advantages, such as fuel efficiency and less hazardous to environment, that IWT offers, speed is not a big issue.

8.6.8 Additional handling

Since, may of the industrial units are on land side with no direct access to waterfronts, moving cargo by IWT requires additional handling at terminals. However, given the cost-efficiency offered by IWT,

the cost of transportation by IWT, including charges for additional handling, would still be lower than the cost of transportation by road.

8.6.9 Funding

Infrastructure creation requires larger quantum of funds. The government with its limited resources may not be able to generate the required amount for creation of infrastructure. The budgetary resources may be used to provide basic infrastructure such as navigable waterways and terminals. The government may actively explore possibility of private sector participation on terms of assured minimum business, initially. For meeting the minimum assured business, the government should use incentives and policy measures. This would attract many private investors into the IWT, who would bring in the required amount for augmenting the infrastructure.

8.6.10 Incentives

8.6.10.1 Inland Vessel Building Subsidy Scheme

As per the Inland Vessel Building Subsidy Scheme (IVBSS), 30% subsidy was payable to the entrepreneurs for construction of inland vessels built in India for operation in national waterways, Sunderbans and Indo-Bangladesh protocol routes. In spite of this scheme, many applicants who were granted approvals did not construct the vessels. This could be due to one of the following reasons:

i. Lack of interest from buyers / operators

ii. Difficulty in accessing finance

This under-construction of vessels has led to shortage of inland vessels available for cargo transportation. For generating interest from the buyer / operators, operational incentives should also be provided.

8.6.10.2 Operational

To encourage the modal shift from road and rail, the State government may provide incentives to the shippers for moving the cargo by IWT. The operators may leverage the incentives and attract cargo shippers to IWT with cost-economical offers. The Working Group on Shipping and IWT had proposed a specific incentive scheme of providing @20 paise per ton-km of cargo moved through identified IWT routes. The State Government may provide the same for use of waterways in the state.

8.6.11 Financing

Most of the players in vessel construction cite that they face difficulty in accessing finance from the banks. Banks in Kerala are averse to financing of vessels as it is complex subject matter and they are sceptical of the viability of business. The government has given the infrastructure sector status to IWT and therefore, it should receive financing on priority. For this bank officials need to made aware of the same so that easy financing could be availed by the stakeholders.

8.6.12 Training

The National Inland Navigation Institute (NiNi) provides training for the manpower required for IWT sector. It is expected that with development of IWT sector there would be shortage of trained manpower. The State government should set up a state level training institute in consultation with NiNi. KSINC in the state has evinced interest in development of manpower and setting up a satellite centre of NiNi in the state. This institute may use the know-how from NiNi in development of required manpower.

8.6.13 Integration

Integration of coastal shipping with inland water would require integration of sea with the inland water at certain places. This may lead to ingress of sea water in the backwaters, thereby possibly affecting the paddy fields. At certain stretches, where the integration of inland water with the sea is possible,

the additional land required may not be under the government's possession and may also be heavily habited again leading to opposition from the local community.

8.7 Conclusion

Kerala is naturally gifted with vast network of waterways and a long coastline. IWT and coastal shipping are complementary in nature to each other for providing hinterland-port-port connectivity. The operational and regulatory paths are already paved for integrating IWT with coastal shipping. However, infrastructural aspects need further attention. In addition, the viability of using the inland waters for movement of cargo toward the nearest port also has to be considered

9 Economics of coastal movements

This chapter highlights the advantages and benefits of coastal shipping, while also suggesting why the coastal shipping would be the need rather than an alternative for transportation in Kerala. The discussion is organized under below mentioned headings:

i. Advantages of coastal shipping
ii. Need of coastal shipping in Kerala
iii. Growth drivers of coastal shipping

9.1 Advantages of coastal shipping

Coastal shipping has many advantages over competing modes of transportation such as road and rail. Following sections discuss the major advantages of coastal shipping for domestic movements.

9.1.1 Congestion free

The road and rail network in India is presently facing capacity constraints at various stretches leading to high congestion on these modes of transportation. Congestion not only leads to delays in transit time but also imposes adverse social and economic costs on the economy, as the scarce and useful resources (e.g. fuel, productive man-days) of the nation get wasted for no specific output. It is estimated that around Rs. 200-300 billion per annum is lost by the country due to road congestion. With a coastline of around 7500 kms., coastal shipping in India would have no such capacity constraints and has the capability to supplement the road and rail network and thus help reducing the congestion.

9.1.2 Fuel efficient

It is widely recognized fact that coastal shipping is a fuel-efficient mode of transportation as compared to road and rail modes. The estimated fuel consumption by these modes is shown in Table 9-1. As per these estimates, coastal shipping consumes only 15% of fuel for transportation as compared to road and 54% as compared to rail.

Table 9-1: Fuel consumption

Mode	Road	Rail	Coastal shipping
Fuel consumption (gm. per ton-km.)	31.330	8.911	4.828

Source: A study by European Union

9.1.3 Environment friendly

Coastal shipping is an environmental friendly mode of transportation as compared to road and rail. The estimated emissions for freight transportation by these three modes are presented in Table 9-2.

Table 9-2: Emission

Mode	Road	Rail	Coastal shipping
Emission in gm CO_2 equivalent / ton-km	64	28	15

Source: Report titled 'Building India: Transforming the Nation's Logistics Infrastructure'

9.1.4 Large parcel sizes

Coastal shipping is capable of transporting large quantities over long distance with ease as compared to road or rail. Moving the large quantities by road / rail requires multiple vehicle / rakes for the same amount of cargo. Table 9-3 shows the parcel size that each mode can carry in single journey.

Table 9-3: Parcel size on different modes

Mode	Road	Rail	Coastal shipping
Parcel size (tons)	9 to 25 tons trucks mainly used for transportation	1000-2500 tons per rake	7000-10000 tons per coastal vessel

Source: Deloitte analysis

9.1.5 Lower capital and recurring investments

Land requirements for three different modes of transportation are shown in Table 9-4. It can be seen that both road and rail transportation would require a larger tract of land as compared to coastal shipping. This is due to the fact that seaway / waterway for coastal shipping is naturally provided. This implies that the development of facilities for coastal shipping would require comparatively lower capital investment. The port and related infrastructure once developed, can be maintained at minimal costs. In contrast, regular investments would be required for maintaining, widening, and strengthening of roads.

Table 9-4: Land requirements for different modes

Parameter	Road	Rail	Coastal
Site requirements	Right of way along the length of alignment, check posts, warehouses	Land across the width and length for tracks, area for yard and station house	Land for jetty facilities only, area for yard, and related activities and close to the waterfront thereby minimising the extent of land acquisition (if required)

Source: Deloitte analysis

9.1.6 Transportation cost

Table 9-5 compares the unit freight rate for transportation by different modes. It is obvious that the unit cost of transportation by coastal shipping is minimum among the three modes. This holds true for large parcel size and large distances. However, when the distance / cargo are smaller, the savings in unit cost is not able to offset additional costs of handling charges at ports. That is why for shorter distances, road transportation would be effective. In general, road transportation proves effective for moving smaller parcels over a distance of around 250-300 kilo-meters. Transportation by rail is effective in moving cargo over a distance of around 300-1000 kilo-meters. However, the coastal shipping would be economical for moving large quantities even over a short distance.

It is often cited that coastal shipping would involve additional handling at its interface with other modes of transportation such as road / rail and therefore would entail higher logistics cost between O-D pair . Given the cost-efficiency offered by coastal shipping and with the advent of River Sea vessels, the cost of transportation by coastal shipping, including charges for additional handling, would still be lower than the cost of transportation by road. This is evident from the transportation costs analysis in chapter titled 'Traffic Forecast' wherein O-D costs of transportation by the inland modes (road and rail) and by coastal shipping were compared.

Table 9-5: Indicatives unit cost of transportation

Distance in km		Road	Rail	Coastal
From	To		(Rs. Per MT per Km)	
1,800	More	1.7	1.27	0.67
1,200	1,800	1.9	1.27	0.75
1,000	1,200	2.1	1.36	0.82
800	1,000	2.2	1.47	0.86
400	800	2.3	1.55	0.90
250	400	2.5	1.70	0.98
150	250	2.7	1.97	1.06
100	150	3	2.24	1.18
50	100	3.5	2.81	1.37
20	50	3.5	4.49	1.37
0	20	3.5	12.37	1.37

Source: Deloitte analysis

It should be noted that the coastal freight rate considered here is based on current freight charged by the shipping companies. However, the relaxation in cabotage law would allow more vessels vying for the coastal cargo. This enhanced competition would enhance the level of service and efficiency and lowering of the costs.

Similarly, the River Sea Vessel Notification under the Merchant Shipping Act would allow the companies to build and operate coastal ships at significantly lower costs. This should also result in decrease in the freight rates.

9.1.7 External costs

The pollution, higher risks due to reduced safety and loss of human lives due to accidents on road are suggested to be having higher costs as compared to coastal shipping. The discomfort and the stress experienced due to congestion and delays, also pose hazard for health. As the roads pass through densely populated areas, transportation of dangerous goods by road becomes riskier proposition. Coastal shipping eliminates this risk for human lives.

Diversion to coastal shipping would ease the traffic flow on the roads and may help in significantly reducing the loss of human lives due to accidents. The estimated cost due to road accidents in India is pegged at Rs. 100 billion per annum.

In year 2009, there were a total number of 451283 traffic accidents in India, out of which 421628 were road traffic accidents[1]. Indeed, with around 130,000 deaths in road accidents annually, India figures as having worst road traffic accidents worldwide[2].

[1] Source: National Crime Records Bureau, Ministry of Home Affairs

Table 9-6: Road accidental deaths in India 2009

Road accidental deaths by type of vehicles	
Truck/Lorry	25136
Bus	12821
Tempo/Van	7425
Jeep	9820
Car	11682
3 wheeler	6616
2 wheeler	26219
Bicycles	3267
Pedestrian	11109
Others	12801
Total	126896

Source: National Crime Records Bureau

From the table above, it is clear that trucks / lorries account for almost 20% of deaths in road accidents. In contrast, coastal shipping is unlikely to result in such higher number of accidents and deaths. On the similar note, coastal shipping is also likely to cause lower damages to the cargo on account of accidents as compared to roads.

9.2 Need of coastal shipping in Kerala

9.2.1 Congestion

Most of the road stretches in Kerala are narrow and vehicular movement is restricted to a speed of less than 40 to 50 km per hour even on national highways. Presently, containers movement by road during day-time is restricted in the state, leading to escalated transit time. Rails are also under capacity constraints. Kerala being a high population density state, availability of land which can be utilized for development of road and rail facilities is usually restricted. Moreover, the facilities so developed may not be enough to cater to the requirement of growing number of vehicles in the state. Therefore, it becomes imminent that development of alternative mode of transportation should be explored to the extent possible, so as to keep the road and rail free from congestion. This would provide easy and speedy evacuation for people and goods in transit.

9.2.2 Nature's gift

The state of Kerala is gifted with a long coastline of 590 kms. which is supplemented with network of waterways across the state. These waterways can connect most of industrial nodes and commercial centres in the state and have the potential for transportation of goods as well as passengers. These resources are grossly underutilized and can be exploited for water transportation. However, there are a few concerns on the development of inland waterways including that of draft, navigability, non-continuous stretches, low lying bridges etc. which has to be addressed before the same can act as a complement for movement of goods through the river sea route. A detailed analysis of the integration of IWT with coastal movement has been indicated in chapter titled 'IWT and Its Integration'.

[2] Source: Deutsche Welle (http://www.dw-world.de)

9.2.3 ICTT Vallarpadam

Commissioning of International Container Transshipment Terminal (ICTT) at Vallarpadam and the consequent industrial development will further increase the traffic in the state. This underscores the increased significance of coastal shipping for serving the transportation requirements along the coast.

9.2.4 Vizhinjam International Seaport

Government of Kerala has planned development of an international seaport at Vizhinjam. The projects is envisaged to be implemented on Public Private Partnership (PPP) basis using the Build, Operate and Transfer (BOT) model. Creation of Vizhinjam, though focus would be on transshipment traffic, will also add to additional traffic in the state, to a certain extent. This further pronounces the need for coastal shipping.

9.2.5 Government focus

The Government has shifted its focus on development of maritime resources of the state for purpose of providing better and easy transportation facilities. This increased focus would ensure proper incentives and policy measures for development of coastal shipping in the State.

9.3 Growth drivers of coastal shipping

From the discussion above, it is obvious that the coastal shipping is bound to grow. While the abovementioned factors would induce use of coastal shipping, following factors would contribute to the sustained growth of coastal shipping.

- Population growth and thereby consumption growth
- Growth of economy and trade
- Increase in transportation demand thereby requiring the need to explore alternative transportation modes
- Increased emphasis on clean development
- Fuel scarcity forcing to utilize fuel efficiently
- Increase in containerization
- Huge investments in maritime infrastructure

In view of these changes, development of coastal shipping becomes more of a need rather than a desire. Therefore, coastal shipping should be put on fast-track development, as it would not only lead to reduced cost of transportation but also reduced social and environmental costs.

10 Strategic road-map cum action plan

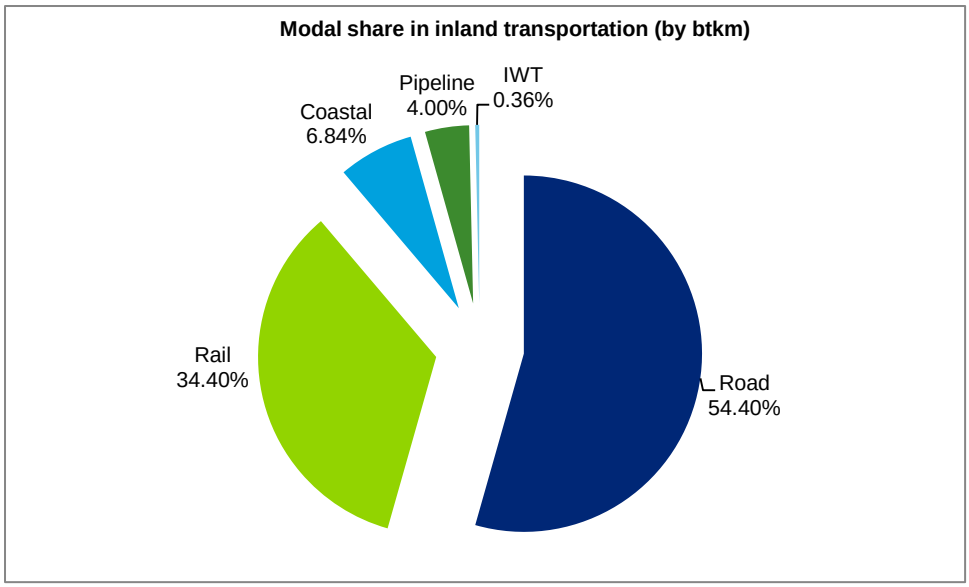
This chapter discusses the actions that need to be taken for addressing the issues and challenges faced by the stakeholders in coastal shipping. These action points, when implemented, would provide an environment conducive for fast-paced growth of coastal shipping in the state of Kerala. While there are certain issues which require the Central Government intervention, the State Government of Kerala can take up the relevant matter with the Central Government for initiating necessary action. The discussion on these action points is organized under following headings:

i. Applicability of important Acts for coastal shipping
ii. Strategy road map cum action plan
iii. Conclusion

The previous chapter outlined that coastal shipping is environmental friendly, energy efficient and economical as compared to rail and road based modes of inland transportation. Hence coastal shipping offers a huge scope of providing relief to the saturated and over-stretched inland transport systems. Likewise, under the present inflationary trends, coastal shipping also provides a great opportunity to reduce the country's logistics cost thereby facilitating savings to the end consumer.

In-spite of these widely recognized benefits; coastal shipping has not witnessed the growth that it should have. Coastal shipping accounts for a significantly lower share in domestic cargo movement in India as shown in **Error! Reference source not found.**.

Figure 10-1: Modal share for inland cargo movement



Source: Various

Coastal shipping acts as an inter-modal transportation and plays an important role in integrated logistics chain in developed countries. Coastal shipping, also known as Short Sea Shipping (SSS), accounts for 43% of cargo traffic in Europe. Other economies such as US and China have adopted development and utilization plans for increased transportation through inland / coastal waterways.

This chapter provides main reasons for underdevelopment of coastal shipping in India, while also providing an overview of some of the salient acts that are governing coastal shipping in India and also explores possible action points required to be undertaken for the development of coastal shipping in the state.

10.1 Applicability of important Acts for coastal shipping

By definition, Coastal Vessel would mean a vessel of Indian Registry with exclusive Indian Crew, engaged in the carriage by sea of passengers or goods from any port or place in India to any other port or place in India and / or any vessel having Specified Period License for coastal trade issued by Director General of Shipping.

Coastal shipping activity in India comes under the supervision of the Ministry of Shipping, Government of India. Coastal shipping is regulated by various Central Government Acts. Some of the salient Acts / Legislations applicable to coastal shipping are indicated below.

10.1.1 Merchant Shipping Act, 1958

The Merchant Shipping Act, 1958 administered by Ministry of Shipping, Government of India currently deals both with ocean going vessels and coastal ships. Under the Merchant Shipping Act 1958, Part XIV deals with Control of Indian ships or ships engaged in coasting trade. Section 407 (under Part XIV) indicates that no ships other than an Indian ship or a ship chartered by a citizen of India or a company or a co-operative society which satisfies the requirements specified in clause (b) or, as the case may be, clause (c) of section 21[3] of the Merchant Shipping Act, shall engage in the coasting trade of India except under a license granted by the Director-General of Shipping under the Section 407. It is also indicated that the license granted under the Section 407 may be for a specified period or voyage and shall be subject to such conditions as may be specified by the Director-General. *While in the Merchant Shipping Act, coastal movement of passengers / cargo is permitted only for an Indian registered vessel, in reality, foreign flag vessels are permitted to ply between Indian ports with cargo / passenger only if suitable Indian tonnage is not available and only after obtaining a No Objection Certificate (NOC) from INSA (Indian National Shipowners' Association).*

For movement of passengers, it has been indicated under Part VIII under the Merchant Shipping Act 1958, that no ship shall carry more than twelve passengers between ports or places in India or to or from any port or place in India from or to any port or place outside India, unless she has a certificate of survey (indicated) under Part VIII in force and applicable to be voyage on which she is about to proceed or the service on which she is about to be employed.

10.1.2 The Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976

The Act describes various zones such as territorial waters, Exclusive Economic Zone, Continental shelf, contiguous zone of India etc. and defines the limit of such waters, shelf or zone with reference to the mainland of India as well as the individual or composite group or groups of islands constituting part of the territory of India. The Act is governed by the Central Government of India.

[3] Section 21 (Under Part V of MS Act – Registration of Ships). Indian Ships– For the purposes of this Act, a ship shall not be deemed to be an Indian ship unless owned wholly by persons to each of whom [any] of the following descriptions applies:--

(a) a citizen of India; or

(b) a company or a body established by or under any Central or State Act which has its principal place of business
in India; or

(c) a cooperative society which is registered or deemed to be registered under the Cooperative Societies Act, 1912 (2 of 1912), or any other law relating to cooperative societies for the time being in force in any State

10.1.3 The Customs Act, 1962

Chapter III (Appointment of Customs Ports, Airports, warehousing stations etc.) and Chapter XII (Provisions relating to coastal goods and vessels carrying coastal goods) of the Customs Act indicates the necessary sections governing the movement of coastal goods. Section 7 under Chapter III mentions that the coastal goods can only be loaded or unloaded at places notified under section 7[4] of the Customs Act, 1962. There have been certain exemptions given to coastal vessels vide Notification 43/97 – Customs (N.T) dated 11th September , 1997 issued under Sec. 98A of the Customs Act, 1962 which exempts[5] coastal vessels from the provisions of Section 92, 93, 94, 97, & 98 (1) of the said Act (these provisions are related to Chapter XII of Customs Act 1962.) As per Customs circular notification number 16/1998 dated 11/03/1998, the vessels carrying exclusively coastal goods will not be required to file Import General Manifest / Export General Manifest.

10.1.4 Income Tax Act, 1961

The Income Tax laws as currently in force will be applicable for coastal shipping companies. Currently coastal shipping companies have to pay a corporate tax of 33.22%. Coastal shipping companies registered under the Merchant Shipping Act can also opt for tonnage tax regime under the Income tax Act.

10.1.5 River-sea vessels notification under the Merchant Shipping Act

The stringent construction and safety standards, laid down for coastal vessels under the Merchant Shipping legislation, rendered the coastal shipping uneconomical due to high cost of construction and operation. High construction and operating cost of coastal vessels was a major impediment for the development of coastal shipping in India. There was a need to bridge the gap between ocean-going vessels and inland vessels by introducing a new class of vessels.

With a view to provide boost to coastal shipping and integration of inland waterways with coastal waters, Director General of Shipping has issued notification on Indian River-Sea Vessels (RSV). This RSV notification lays down the standard for construction, safe operation and certification of river-sea vessels exclusively engaged on trade between Indian ports. These standards are less stringent yet maintain the levels of safety commensurate with the expectations of Government of India and the public.

The RSV notification has paved the way for seamless integration of river-sea trade using coastal ships that will provide an alternative means of quick discharge and dispersal of cargo from mother ships at a port and its carriage by the sea route to various ports along the sea board. This will also play an important role in the growth of Indian economy.

The RSV notification prescribes rules for following types of River-Sea Vessels with regard to design, construction, manning, operation and pollution prevention requirements.

Type 1: vessels engaged in ship to shore operations upto a maximum distance of 12 NM in fair weather only.

Type 2: vessels engaged in operations between nearby ports during daylight hours in fair weather only.

Type 3: vessels engaged in operations between Indian ports in fair weather conditions where voyage duration does not exceed 24 hours.

[4] Section 7 under Chapter III of the Customs Act 1962 mentions the provisions for the appointment of customs ports, airports and indicates that The Board (Central Board of Excise and Customs) may, by notification in the Official Gazette, appoint the ports which alone shall be coastal ports for the carrying on of trade in coastal goods or any class of such goods with all or any specified ports in India

[5] The relaxations are applicable to the vessels which exclusively carry coastal goods and ply as coastal vessels. It will not be applicable for vessels which convert the status from foreign run to coastal run & vice versa

Type 4: vessels engaged in operations between Indian ports in all-weather conditions

These vessels can be built and operated at significantly lower cost than the existing coastal vessels. Consequently, it is expected that the vessels construction for coastal shipping purpose will gain fast momentum. The reduced costs would encourage coastal shipping, inland water transport and trade and thus help in development of coastal shipping in India.

However, the notification has not relaxed the provisions in case of passenger vessels, tankers, vessels carrying bulk chemicals or gas in any form (packaged or otherwise), fishing vessels among others.

10.2 Strategy road map cum action plan

Development of coastal shipping requires addressing the multiple issues that are becoming the bottlenecks in the growth of coastal shipping. All of these issues may not be confined to Kerala and would be encumbrance at national level as well. Further, as the coastal shipping is governed by the Union Government's legislations, the changes required may not be under the control of the State Government. Nevertheless, the State Government should make efforts to influence the decisions wherever deemed for bringing about the required changes. The State is member of Maritime State Development Council (MSDC) and it can put forth its perspectives on issues of maritime industry. This platform can be utilized by the State government in lobbying for the required changes at the central level.

The infrastructural bottlenecks, such as inadequate port facilities and lack of proper supporting land-side infrastructure, have been the most crucial factor hindering the growth of coastal shipping. The advantage of lowest unit transportation cost for coastal shipping gets offset for end-to-end movement owing to poor supporting infrastructure. Indeed, the overall cost exceeds the cost of transportation by road. To realize the latent potential of coastal shipping, adequate port and related infrastructure coupled with integrated transportation system and proper Government support are required.

Issue / challenge	Current situation	Remedial measures	Level of intervention
Infrastructure			
Ports and related infrastructure	Presently, coastal shipping operations in Kerala are Cochin-centric, as the non-major ports suffer from lack of availability of adequate draft and cargo handling equipments. Lack of adequate infrastructure is the biggest bottleneck in the development of coastal shipping. Shippers currently prefer to operate coastal vessels having draft of 7-9.5 meters. Adequate depth for such vessels is not available at the non-major ports. Even a river-sea vessel would require a draft of around 3.5 meters for carrying out coastal operations economically.	The required depth has to be provided at all the non-major ports. The state already has basic port infrastructure, which can be upgraded to match the requirement. The chapter titled 'Infrastructure' suggests the minimum infrastructure at identified ports that is required for development of coastal shipping in the state. However, it should be noted that the providing requisite draft at certain port locations may entail high dredging costs, which may not be justified given the traffic forecast for the port. Therefore, initially the existing draft may be upgraded for operations by the river-sea vessels for transportation of cargo. The required infrastructure is suggested for each of the port separately.	State government

Issue / challenge	Current situation	Remedial measures	Level of intervention

Port infrastructure required for coastal shipping operations

Azhikkal	2 Multipurpose terminals for catering to both general and bulk cargo of length 135 m x 20 m each having a capacity of 1.20 million tonnes A coastal passenger berth can also be developed.
Kollam	The existing berth of 177 m x 12 m can be used as a multipurpose terminal for catering to both general and bulk cargo. The existing wharf would need to be strengthened and after strengthening, the operational capacity of the berth would be around 2.75 million tonnes In addition, a coastal passenger berth can also be developed
Alappuzha	A container berth of length 213 m and 45 m breadth can be developed. The container terminal can also accommodate passenger / ferry berth(s) on the other side.
Beypore	The existing berths (2 wharves) can be strengthened for handling of the cargo. In the event the cargo exceeds the actual capacity of the berths, an additional berth can be developed to cater to the envisaged coastal cargo volume. Given the anticipated coastal passengers movement, a passenger berth should be created.

Issue / challenge	Current situation	Remedial measures	Level of intervention

The Type IV vessels under the River –Sea Vessel notification are allowed to ply between the Indian ports in all weather conditions and would require a draft of around 3.5 meters. The state government can provide the necessary fillip to local ship builders in Kerala to develop river sea vessels and also encourage the local shippers in Kerala to use river sea vessels to call on the Kerala non-major ports for their cargo shipments.

Alternatively at places where the draft is less than 6 to 7 m, facilities should also be provided for undertaking lighterage operations at an efficient pace and thereby ensuring a quick turnaround of the vessel at the anchor. Later on, in phased manner the draft should be increased at the non-major ports as suggested in table below.

Port	Existing draft	Additional dredging required for river sea vessels	Additional dredging required for larger vessels
Azhikkal	Depth available in front of berths varies from -4.00m to -6.00m	Removal of few shallow patches, if needed	To provide future deepening in front of berths, the design dredged bed level for all berths is considered as -12.00m CD

Issue / challenge	Current situation	Remedial measures				Level of intervention
		Beypore	-3.00 to -4.00 m	Dredging required to maintain a draft of -4 m	Considering the preference of shipping companies to operate vessels with draft of 7-9.5 m, additional dredging should be done to ensure 11-12 m. depth.	
		Kollam	-6.3 m	Not applicable	From -8.00 to -10 m (wharf designed for a draft of -10m)	
		Alappuzha	-4.0 to -5.0 m at the end of the existing pier	Dredging required to maintain a draft of -4 m to -5m	Considering the preference of shipping companies to operate vessels with draft of 7-9.5 m, additional dredging should be done to ensure 11-12 m. depth.	

Issue / challenge	Current situation	Remedial measures	Level of intervention
		The ports developed should be like modern-mini ports having facilities for communication, proper evacuation, storage, safety, passenger, movement, connectivity and utility services. Adequate passenger facilities, for people to rest while waiting for the boats to come, food and other services need to be made available at each of the port locations to attract passenger traffic.	
Dedicated berths	Lack of adequate berthing facility (number of berths, sufficient length for proper berthing of the vessels) at the non-major ports is another problem, which forces incoming vessels to keep waiting idly, when the particular berth to call is occupied with another vessel. Further, major ports usually provide priority to foreign-going vessels, as they are operating in competitive environment and would want to project a better revenue and cargo performance. Therefore, coastal vessels are given second-rate priority and a step-motherly treatment.	The government has plans to develop multiple non-major ports in the State. Unlike a major port, it would be difficult to have a dedicated berth for coastal vessels, it would be worthwhile to have one at a non-major port , once the cargo volume of both EXIM and coastal cargo vessels gain in the long run for the port. These dedicated berths can be on lines of domestic terminals at airports and would be used for coastal cargo only. Therefore, the coastal vessels need not wait idly. By having dedicated terminals, the ports can also compete separately for the overseas and coastal cargo, thereby ensuring better services for both types of vessels. Ports such as Kollam which is near a major upcoming transhipment port of Vizhinjam or Alappuzha which is near Cochin, a major port, can be dedicated minor ports only to service coastal shipping. This is because these minor ports are too close to a major port to effectively compete with them. The minor ports can also act as feeder services to the major ports and at the same time accord full facility for coastal shipping vessels.	State government
Cargo handling equipments	Most of the non-major ports falter in having the proper material handling equipment in place sufficiently adequate to enable the vessel to discharge its cargo efficiently thereby facilitating a quick turn-around. Absence of efficient cargo operations discourages the coastal vessels which otherwise would have been interested to call at the particular port.	The terminals at the ports require cargo handling equipments. At the ports being developed on PPP mode, the required equipments would be installed by the investor. For other terminals, the Government can get these equipments installed by the operators on use and pay basis. This means that a person / entity would rent out the equipments to the Government against a guarantee of minimum business. The user pays the charges for	State government

<table>
<tr><th>Issue / challenge</th><th>Current situation</th><th>Remedial measures</th><th>Level of intervention</th></tr>
<tr><td></td><td></td><td>usage at a pre-decided rate. This would mitigate the investors' commercial risks while ensuring adequate facilities at the ports.

<table><tr><th>Port</th><th>Cargo handling equipments required</th></tr><tr><td>Azhikkal</td><td>Conventional mobile grab cranes or poclains with or without conveyors. The material handling equipment would vary depending on the type of cargo.</td></tr><tr><td>Beypore</td><td>A 1 x 20 T mobile crane is already present at the port. In addition, multi-purpose mobile cranes can also be procured based on the cargo volumes generated</td></tr><tr><td>Kollam</td><td>Multi-purpose mobile cranes or fixed cranes of 20 tonnes capacity with a radius of about 20 m can be deployed</td></tr><tr><td>Alappuzha</td><td>One Mobile harbor crane can be provided to handle the containers.</td></tr></table></td><td></td></tr>
<tr><td>Space for infrastructure development</td><td>As per the 2001 census, amongst the states, Kerala is the third most densely populated state in India. Availability of space for infrastructure development is a huge concern in Kerala and most of the non-major port locations are accordingly constrained for adequate space for storage, goods shed, and processing centres. Additionally, space is also required at the ports for setting up of facilities such as customs area, CFS, vehicles-transit, which will facilitate smooth operations for users.</td><td>Land is quite scarce in Kerala and acquiring land for development projects, affecting the community and the environment becomes sensitive issue in the State. This may pose a challenge for the PPP investors willing to invest at the ports. These PPP investors may not be able to acquire the required land. Therefore, the State Government should take pro-active approach and acquire the land by itself and then hand it over to the PPP investor.

For this purpose, the State Government can formulate clear-cut guidelines on land acquisition norms and the process to be</td><td>State government</td></tr>
</table>

<table>
<tr><th>Issue / challenge</th><th>Current situation</th><th>Remedial measures</th><th>Level of intervention</th></tr>
<tr><td></td><td>Development of infrastructure also affects communities. For example, the land acquisition requires displacement of people to another place. Land acquisition is a sensitive issue in Kerala. These processes have impact on the livelihood of people who get affected and therefore the development receives opposition from communities. The community opposition to development is much more pronounced in the state of Kerala. Investors become wary of such oppositions. There have been instances of investors withdrawing from the committed investments in the state on account of such oppositions from the local communities.</td><td>followed thereupon. These guidelines should include the measures to be undertaken for rehabilitation as well as compensation for opportunity loss.

The availability of land at selected port locations is furnished in table below:
<table><tr><th>Port</th><th>Land availability at ports</th></tr><tr><td>Azhikkal</td><td>152.45 acres of land is available</td></tr><tr><td>Beypore</td><td>Around 3.8 ha</td></tr><tr><td>Kollam</td><td>Existing port land is around 11 acres. In addition backup area of around 11 acres of land is available on the east side of the small leeway breakwater. The referred land is under government possession</td></tr><tr><td>Alappuzha</td><td>The main land available with the port is what exists in the beach. The beach is 1500 m in length and 100 meters in width (15,000 sq. meter) around 4 acres. Apart from the beach, there are some parts of land adjacent to the beach road that lies under the purview of the Port</td></tr></table>Wherever the required land is not available or is difficult to acquire, the evacuation of cargo can be planned by creating infrastructure such as over-bridges, dedicated flyovers, etc. Moreover, the land can be augmented through reclamation on the sea side, which will also obviate the need for displacement or rehabilitation of community from the vicinity of port location.</td><td></td></tr>
</table>

Issue / challenge	Current situation	Remedial measures	Level of intervention
Last mile connectivity	The last mile connectivity is indispensable for attracting cargo traffic at any port. National Highways Authority of India (NHAI) has the mandate for providing road connectivity to the major ports, while Rail Vikas Nigam Limited (RVNL) is the nodal agency for boosting the rail connectivity to ports and development of corridors to hinterland including multi-modal corridors for movement of containers. However, the non-major ports in Kerala are not having the requisite hinterland connectivity. The roads leading to the ports are narrow, yielding them unsuitable for containers / cargo movement. The inefficient underdeveloped supply-chain becomes a bottleneck in development of coastal shipping and renders the end-to-end logistics cost uneconomical while also increasing the total transportation time.	The last mile road connectivity between the port and the hinterland has to be provided by the State Government. Accordingly for the development of each non-major port, the last mile road connectivity should be chalked out by the state government in concurrence with the various town planning authorities. Wherever work needs to be done with NHAI or RVNL, the State Government must, through the Maritime State Development Council (MSDC), proactively engage with the central government agencies in ensuring that these connectivity projects are implemented. At each of the port locations, adequate passenger transportation services need to be provided for transfers of people from waterfront area to the city centres and vice versa, at reasonable rates.	State government
Ship repairs units	Presently there are 26 SRUs registered with DG Shipping, of which only 7 have been given permanent approval. These include Alcock, Chennai Port Trust, Cochin Shipyard Limited, Garden Reach, Hindustan Shipyard Limited, Mazgaon Dock Ltd. and Mumbai Port Trust. The balance SRUs are given licenses for a limited duration & for specific activity and licenses are periodically renewed by DG Shipping. Most of these SRUs do not have their own shipyard. They are mostly workshops as on the port premises or adjoining areas (mostly major ports). In addition to the Shipyards, there are dry-docks available with the Port Trusts which can also be used for limited repairs of ships. Earlier, till the 80s around 90% of the Indian vessels were repaired in India. However due to the lull in	The State Government, under the aegis of Ministry of Shipping, should promote setting up of the Ship Repair Units catering specifically to coastal / smaller vessels at some of the non-major port locations. Apart from attending the various technical issues for smaller vessels, it would be an additional source of revenue for the port. Possible port locations which can be considered for setting up SRU only coastal shipping may include Kodungalloor / Munambam or Ponnani.	State government

Issue / challenge	Current situation	Remedial measures	Level of intervention
	shipping business in 1990s, a lot of ship repair business either closed down or pursued alternate business models. Ship repairers also started concentrating more on ship building due to greater profitability and value addition. The demand supply gap for ship repair services has thus widened over the years in view of increasing demand posed by a growing fleet and a stagnant / diminishing supply of services due to conversion of facilities from repairs to ship building. For smaller vessels including coastal vessels the problem is manifold accentuated, since the existing SRUs give priority to bigger (foreign going) vessels and navy ships. Hence the coastal shipping vessels are forced to undertake repairs from unregistered Ship Repair Units. These unregistered SRU operators do not care to comply with any of the restrictions normally placed on the registered ship repairers. They neither have the requisite qualifications nor do they bother to get themselves registered. It is hence acknowledged that the quality of services offered is substandard. However the coastal shipping companies due to non-availability of other alternatives and to commence the shipping activity of their vessel are left with no other choice but to approach these unregistered SRUs to quick-fix their vessels.		
Parking space for vessels	Vessels engaged in coastal shipping are required to move within the territorial waters of the country. Movement of these vessels close to the coast leads to the occurrence of frequent repairs to the vessels primarily due to the water close to the coast not being		

Issue / challenge	Current situation	Remedial measures	Level of intervention
	very clean and hence waste material get entangled in the engines and other vessel equipment. In addition, the fishing nets set by the trawlers get entangled in the vessel's propellers. Due to the need of undertaking frequent repairs, the coastal vessels require idle berthing space at ports, wherein the repairs can be undertaken. The space for parking of idle vessels is not adequately available at the ports.		
Regular and integrated coastal services to non-major ports	An inhibiting factor for growth of coastal shipping has been the point-to-point transportation. As vast majority of production units and a large number of consumption centres are land-locked, coastal shipping can't provide point-to-point transportation facility. This point-to-point connectivity is effectively provided by road transportation, which is why road transportation is preferred by shippers. The movement of goods by coastal shipping is gaining momentum in the state, mainly between Gujarat ports and Cochin port. However, regular and reliable services are not available at non-major ports in the state. The coastal shipping services are provided by private players. Given a situation in the future when the non-major port locations have the requisite infrastructure, the coastal shipping service providers would be wary of calling on non-major port locations in Kerala, if the port location do not provide them sufficient cargo volume thereby facilitating them to recover the cost of their operations, Similarly shippers would continue routing their cargo to Cochin port till the time they are convinced of regular	With the creation of infrastructural facilities, there has to be service providers for utilising those facilities. To resolve this challenge, the service provider has to be assured of definite cargo volume. Initially for few months, the government may consider to provide guarantee for minimum throughput for well-chosen shipping service provider/s for operating regular and reliable services. Once this happens, the cargo would start flowing, thereby making the operations sustainable without any Government guarantee later on. . In addition, as coastal shipping is an inter-modal transportation, the transportation to origin / destination has to be either by road / rail. This calls for integrated service offerings from perspective of shippers, who would not want to have interface with multiple agencies. To provide such services, proper 3PL service providers need to come forward in establishing the link for multi-modal transport operations. The Government must develop these coastal shipping minor ports in conjunction with the 3PL service providers so that the last mile connectivity issue is sorted out.	State government

Issue / challenge	Current situation	Remedial measures	Level of intervention
	services being called on the non-major port close to their factory location. This then becomes a chicken and the egg situation.		
Fiscal			
Imposition of duty on bunker oil	Coastal ships, unlike oceangoing vessels, have to pay duties on bunker oil. For example, Indian Oil Company Limited charges a foreign going vessel Rs. 25,000 per ton for bunker fuel oil, while for coastal shipping it is Rs. 48,000 per ton[6]. In addition, when a foreign going vessel has to undertake a coastal run, assessment of duties payable on bunkers remaining on board is required. This exercise is highly cumbersome and leads to further delays. Further, considering that competition for coastal shipping is with road transport for which diesel is subsidized, it would be a prudent move to do away with the duties on bunker oil to make coastal shipping more cost economical.	There have been demands for removal of duty on bunkers used by vessels on coastal shipping operations. However, the same has not been conceded by the Union Government. The Government of Kerala has reduced VAT from 12.5% to 0.5% for bunker supplied to foreign going vessels at the multi-user liquid terminal at Puthuvypeen Special Economic Zone (SEZ) in Kochi. This area being SEZ, the bunker would not attract customs and other duties. With a view to promote coastal shipping, the state government should strongly put the case for removal of the duty on bunkers for coastal shipping. Further, the VAT relaxation on fuel should also be extended for coastal vessels by Government of Kerala for all other minor ports as well.	Central and State Government
Abatement of service tax	Transportation of goods by road is exempted from the payment of service tax unconditionally to the extent of 75% of the freight. In other words, service tax is required to be paid only on 25% of the freight. Until recently, there was no exemption / abatement on transportation of goods by coastal shipping. However as per the recent union budget tabled in 2011 an exemption of 25% from the taxable value is being provided in respect of services rendered in relation to "transport of coastal goods" and goods transported through "national	As the Government wants to promote coastal shipping, the State Government should pursue the case for extending the service tax exemption for coastal shipping. This is considering the lower external costs it imposes on the environment and society. In the event the full exemption can't be extended, the exemption similar to transportation by road, i.e. 75%, is what should be provided at the minimum.	Central government

[6] Rates at the time of obtaining inputs

Issue / challenge	Current situation	Remedial measures	Level of intervention
	waterways" or "inland water".		
Financing	Coastal vessel owners find it difficult to avail finance at competitive interest rates for purchasing of vessels. Some of the players have cited difficulty in accessing financing from established financial institutions for purchasing vessels. The financial institutions are disinclined to lend as they deem lower profitability of the industry a higher risk for the lender. This emanates from their lack of experience in ship financing. Particularly, banks in Kerala are said to be averse to financing of vessels as it is a complex subject matter and bankers are sceptical of the viability of business. As per the industry operators, it takes months to convince the bankers. Moreover, the banks charge around relatively higher rate of interest for shipping business. As mentioned in the Working Group Report, around Rs. 10000 Crores would be required for acquisition of coastal vessels.	Shipping sector is capital-intensive and requires relatively higher amount of financing and is prone to higher risks. This makes the banks reluctant to offer finance to shipping companies. There have been demands for dedicated Coastal Shipping Development Fund (CSDF) for long time. However, arranging a corpus of required sum is a big challenge. Nevertheless, the State Government is required to incorporate the same in its agenda for pushing it through to the Central Government. This fund should also extend the financing for acquisition of river-sea vessels. Additionally, the State government through Maritime State Development Council (MSDC) should approach Reserve Bank of India for issuing a directive to banks for providing finance to the coastal shipping companies at concessional rates for a certain period. Alternatively, on lines of IL&FS and IDFC, there could be a specialized financial institution at the state level catering to the financing requirements of maritime sector including ship builders, ship owners, port developers, dredging companies, etc. If a new institution is not set up, any of the existing state financing agencies could be tasked with this responsibility.	Central and State government
Legal / institutional			
Documentation	Based on the inputs obtained from the stakeholders including coastal shipping companies, following are the documents required for coastal movement of cargo: • Bill of Coastal Goods (BCG) – BCG is a mandatory document and 6 copies of the same are made. One	The quantum of documentation that a shipper has to deal with when dispatching the goods through road / rail is relatively less than the documentation required for coastal movement, which is almost equivalent to the documentation involved for EXIM cargo dispatched in foreign going vessels. While the relevant	Central and State government

Issue / challenge	Current situation	Remedial measures	Level of intervention
	copy is stamped by the Customs at the loading port, which is later verified and stamped by the Customs at the unloading port. One copy of the BCG each also has to be filed at the Customs office at the loading / unloading port • Import / Export General Manifest • Invoice from the shipper (mandatory) • Delivery challan (optional) • Packing List (optional) • Quality Certificate / Technical Specifications / Testing Certificate (Optional) • Weigh measurement list • Departure Deck Cargo Certificate • Departure Stores List • Departure of Same Bottom Cargo and Arms & Ammunitions Certificate As per the Central Board of Excise & Customs circular notification number No. 16/98-Cus dated 11/3/98, it has been indicated that the vessels carrying exclusively coastal goods will not be required to file IGM/ EGM. However on interaction with the stakeholders, it has been indicated that they are still require to file the IGM/EGM documents. Further, stakeholders also revealed that officials even demand Bill of lading / bill of entry in name of coastal bill of lading / coastal bill of entry. As per the notification from the Directorate General of Shipping, the coastal cargo does not require all these documents. However, the practice has not changed yet. These are bureaucratic impediments imposed by the officials and create barriers for the easy	notifications have done away with the requirements for cumbersome documentation, the same is not done in practice. The State government should pursue this issue actively with the Central Government. A large number of formalities of documentation can be done away by computerization. This computerization should offer different modules for users, port authorities, shipping companies and government officials. These modules should be integrated with each other in a process flow model, so that the information can travel seamlessly and can be accessed by relevant person, anytime. The computerization should streamline formalities and provide a platform for speedy clearance of the cargo. This would provide a fillip for attracting the coastal vessels to the non-major ports. The user community should be encouraged to have compatible computerized system which can exchange data and information with the port system. The processes and clearance formalities can be made online to the extent possible. Later-on the same may be extended on lines of Port Community System (PCS).	

Issue / challenge	Current situation	Remedial measures	Level of intervention
	movement of coastal cargo.		
Customs clearances	Road / rail are the competition for coastal shipping. When a consignor dispatches his goods through road / rail, he need not undertake customs formalities and expects the same if he plans to dispatch his goods through coastal mode. In case of coastal shipping, as indicated in previous section, the Bill of Coastal Goods has to be reviewed / stamped by the Customs Authority of the loading/ unloading port. Accordingly, the responsibility of having the coastal cargo cleared through the customs falls on the Shipping Company. While officially, a coastal vessel is exempted from paying customs duty, it has been reported that in most of the 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.	Central government
Interpretation of the Customs Notification	Another issue is the interpretation of the contents mentioned in the Customs Notification circular number 40/97 dated 19/9/97, wherein it has been indicated that vessels carrying coastal cargo exclusively, are exempted from provisions of Section 92, 93, 94, 97, & 98 (1) of the Customs Act, 1962. However these relaxations are applicable to the vessels which exclusively carry coastal goods and ply as coastal vessels. It will not be applicable for vessels which convert the status from foreign run to coastal run & vice-versa. Further, it has also been indicated in the notification that the Customs Officers would continue to		

Issue / challenge	Current situation	Remedial measures	Level of intervention
	have powers to board any vessels carrying coastal goods and can require the person in charge of Vessels to produce any documents & to answer any question. Accordingly, citing the contents of the notification, the Customs Officer concerned can misuse the powers vested on him to delay / impede the clearance of the coastal shipping vessel.		
Lack of clear policy measures	The coastal shipping in India is regulated by the Director General of Shipping, mainly under the ambit of Merchant Shipping Act, 1958. The Merchant Shipping Act, 1958, deals both with oceangoing vessels and coastal ships and sets equal standards and norms for both. For example, coastal shipping in India operates on the stringent standards viz. International Safety Management (ISM) code, International Ship and Port facilities Security (ISPS) code, as applicable to foreign going ships. This imposes additional burden on the coastal shipping operator and results in higher operational costs.	The requirements stipulated for coastal shipping were similar to as applied in case of overseas shipping. Coastal shipping being less prone to the complex nature of overseas shipping and related activities, required much simpler terms. However, this did not happen. Recognizing this, the Government has relaxed some of the requirements under the Merchant Shipping Act and also notified a new class of river-sea vessels. However, there exists no single policy which covers entire gamut of coastal shipping requirements. A proper policy on coastal shipping is the dire need of the hour. The State Government, within the ambit of Union legislation, may formulate a comprehensive policy aimed at promotion of coastal shipping in the state.	Central government
Infrastructure industry benefits for coastal shipping	While the ports and inland waterways are included in definition of infrastructure, shipping and vessels are not considered as infrastructure. Infrastructure status makes the industry eligible for tax holidays for the first ten years on commencement of operations and tax concessions at a stipulated percentage of the net profits for the next five years, exemption from levy of Minimum Alternate Tax. Conferment of Infrastructure status on Ports has facilitated a good amount of PPP investments in the maritime sector of the country. Likewise if the	In-spite of long standing demands for conferring the same status on shipping, the same has not been accorded. The recently tabled budget also overlooked this aspect, while conferring the infrastructure status on cold storage chains. Given the quantum of benefits that can be harnessed by opting for coastal shipping, the sector should be given a big boost. Extending the benefits for coastal shipping as available to infrastructure industry, would prove to be a major thrust for the growth of coastal shipping.	Central government

Issue / challenge	Current situation	Remedial measures	Level of intervention
	Infrastructure status is also extended to another vital cog of the maritime sector viz. "Shipping", the associated fiscal benefits will encourage the shipping industry in general and Coastal shipping in particular facilitating the coastal shipping companies to pass on the benefits availed to their shippers thereby reducing the landed price of goods to the final destination.		
Lack of government support	Coastal shipping did not receive the merited support from the Government. The thrust of infrastructure creation was focused more on land based resources. The Shipping sector in India accounted for around 5% of funds allocated to the Transport sector under Five Year Plans and coastal shipping accounted for further lower share. Lack of government support tilted in favour of other modes of transportation also affected the growth of coastal shipping.	If the government were to promote coastal shipping, they should give preferential treatment to the coastal shipping. There have been many studies on coastal shipping, almost each citing the same issues and challenges. However, not much has changed. In order to promote coastal shipping, the Government needs to accord preferential treatment to coastal shipping vis-à-vis other modes. The government has to provide additional support by means of funds infusion for coastal shipping. The funding can be organized from following avenues: i. Budgetary allocations ii. State Government grant iii. Central government grant iv. Borrowings from banks / financial institutions v. Funding / Lending from multilateral agencies such as Asian Development Bank / World Bank vi. Public-Private Partnership (PPP) The PPP mode should be given emphasis for funding of infrastructure projects, primarily for the reason that PPP projects will offload part of the financial burden on the Government, while ensuring efficient operations.	Central and State government
Stringent	Under the Merchant Shipping Act, coastal vessels were	It is recently, that the Government, by introducing river-sea	Central and

Issue / challenge	Current situation	Remedial measures	Level of intervention
specifications relating to construction of vessels	required to be constructed to specifications of oceangoing vessels even though they are not subject to the same stress and turbulence. These stringent specifications resulted in high cost of vessels construction. This high cost made the operations costlier, which became a major hindrance in expansion of coastal shipping.	vessels, has allowed vessels to be constructed with less stringent requirements while not compromising on safety standards. This should pave the way for increased momentum of ship construction for coastal and inland waterways. To fast-track the vessel construction activities due support should be extended for building of river-sea vessels.	State government
Cabotage law	In India, as in many other countries including developed ones, coastal trade has been reserved for transportation by Indian flagged vessels. The exception is provided in case of no suitable Indian vessel is available for the purpose and on obtaining the necessary NoC from INSA (Indian National Shipowners' Association). A section of stakeholders feel that protection provided by cabotage law to domestic sector restricts the growth of the coastal shipping, citing the non-availability of adequate tonnage. Further, it is expected that allowing foreign vessels would bring in competition and thereby would enhance the level of service and efficiency. Another section opposes the relaxation in cabotage saying that foreign flags will not be governed by the stringent norms for coastal vessels such as manning scales, minimum remuneration, etc. required in India. Moreover, such ships would be enjoying favorable foreign taxation rules and subsidies.	This is a difficult issue to address and requires balancing of the trade-off between protection to domestic industry and ensure a fair competition in the sector. The required action would be to provide relaxation in cabotage by allowing foreign vessels to compete for coastal cargo at certain stretches. The relaxation may be withdrawn, once adequate Indian tonnage and regular services are available. As outlined by the report of Working Group on Shipping and IWT, increasing Indian tonnage has inherent advantages which are listed below: i. Freight revenue remains within the Country ii. National tonnage gives the negotiating power to control freight costs iii. It contributes to development of allied industries iv. National tonnage maintains the supply for essential cargo, e.g. 100% of the total crude imports from the Middle East during the Iraq war came on Indian ships A relaxation in cabotage also means that a large chunk of tonnage would replace Indian flag with a tax-efficient and flexible flag.	Central government
Income tax	Indian seafarers employed on foreign vessels or Indian vessels which ply outside Indian territorial waters for	To attract people for manning the coastal vessels, the salary of crew of coastal vessels may be granted an exemption from	Central

Issue / challenge	Current situation	Remedial measures	Level of intervention
on crew	more than 183 days in a year are entitled to nonresident status and pay no taxes. This does not apply to officers and seafarers on coastal ships. Experienced officers who come to man coastal vessels after manning foreign vessels increase their salary expectations to offset the loss of income due to tax, thereby making the coastal shipping company pay more to the experienced candidate.	Income Tax for a suitable period.	government
Labour	Kerala has been mired with labour strikes across industries and the port sector is no exception. Labour union demands are seen as unreasonable by stakeholders, as the incremental charge for labour is disproportionately higher and has an effect of increase in prices. It is estimated that the labour costs 10 times in Kerala as compared to other states such as Gujarat. Due to labour problems, the EXIM cargo volume at Cochin port is slowing down. Shippers from South Kerala are transferring cargo to Tuticorin port and New Mangalore port is catching up with the shippers in northern side. Cargo routed through ports in Kerala has additional risk of delays on account of labour strikes. The problem has been persisting for many years, but not much has been done to control such incidents. As a result private investors have distanced from investing in the state.	The Government needs to put a break on frequent incidents of labour strikes in the State. While, the situation has improved over the past few years, the problem is still serious. Existing businessmen as well as prospective investors have unanimously voiced their concerns over the state of labour in Kerala. This calls for immediate attention from the Government.	State government
Operational			
Transit time	The total time taken in transportation by coastal shipping is higher than transportation by road. This is on account of undeveloped infrastructural facilities. For example,	The higher transit time emanates from the underdeveloped infrastructure and inefficient logistic chain resulting from absence of multi-modal / integrated transportation service providers. Once	State government

Issue / challenge	Current situation	Remedial measures	Level of intervention
	the sea-voyage would take only 2.5-3 days for Kandla to Cochin; however the transition at inland legs on the both ends consumes lot of time. As a result, the end-to-end transportation takes somewhere around 15 days time. The same cargo when transported by road would take around 5-7 days.	the requisite infrastructure in terms of proper berthing facility, efficient material handling equipment, regular services of coastal shipping companies are available, the transit time will become similar to that by road. The recommendation made earlier as regards coordinating with the 3PL logistics service providers is important in this context.	
All-weather operations	Non-major ports in Kerala are mainly fair-weather or lighterage ports. The coastal operations may not be feasible during the monsoon season which will result in 3-4 months halt. The monsoon period is a busy time as the shipments for Christmas move at that time. This forces a shipper to resort back to the road transport operators.	As considered under the infrastructure section, the port facilities developed should be capable of all-weather operations, to the extent feasible and possible given the context of cargo availability.	State government
Manning of coastal vessels	It has been observed that both the quality of crew manning the coastal vessels as well as the number of officers (particularly in senior ranks) is found to be wanting. Manning is a one of the major concerns in operations of coastal vessels as the coastal vessels find it difficult to keep the requisite number of certified crew on board as per manning requirements. Qualified officers prefer to man foreign vessels, since their time on the foreign going vessel is considered in their experience and promotion. An officer's time on a coastal vessel is taken at one-third of his actual service on the vessel.	To encourage good quality crew in coastal vessels, there is need of separate / specific courses / training for coastal shipping. This qualification and years of working in costal shipping, would be acknowledged for operations in territorial waters only. The candidate is also aware that his future would lie in coastal shipping and hence would try to give his best for the coastal shipping industry, rather than treat the coastal shipping as a stop gap arrangement for his eventual career plans to shift to manning overseas vessels. It must however be stipulated that a minimum standards of proficiency and eligibility criteria should be adhered for the candidates to opt for the courses offered for coastal shipping. In addition, it will also renew interest of Indian crew manning foreign vessels to shift to coastal vessels if their time spent in coastal vessels is taken at par with the time they spent on foreign vessels.	Central and State government

Issue / challenge	Current situation	Remedial measures	Level of intervention
Non-availability / limited return cargo	There is a significant cargo movement from North India to South and hence coastal shipping vessels have more than adequate cargo to ply from Gujarat to Southern India. However the quantity is not replicated during the South to North movement of the coastal vessels forcing the vessels to ply empty or with limited cargo. This affects the profitability of the shipping companies and forces them to charge higher rates for their North to South movement to compensate for their loss when they are moving empties from South to North. In the long run some of the shipping companies may shut shop citing un-viability. In case of road, even if the transporters are not able to obtain return cargo from Kerala, they can move towards Bangalore or Tamil Nadu for sourcing return cargo destined for North. However, this cargo would not be available for coastal shipping.	To avoid such a scenario, an appropriate incentive framework may be worked out to encourage the trade to adopt coastal movement of goods. The Shippers can be provided with tax incentives for the amount of cargo they divert to coastal shipping. The State government may consider providing incentives on ton-km basis to the shippers for moving the cargo by coastal shipping. This would mean that the shippers are incentivised for modal shift from road to coastal shipping. Additionally, the Government may provide cargo support by making it mandatory to divert part (say 10%) of cargo for government agencies / companies to coastal shipping.	Central and State government
Limitation of integration of coastal shipping with Inland Water Transport	The River –Sea notification provides the necessary impetus for movement of a vessel from river to sea and vice versa. Presently in Kerala, FACT (Fertilizers & Chemicals Travancore Limited) moves around 99% of the total cargo (being moved along the inland water) from Cochin port to its factory at Udyogmandal. However, there are some of the impediments for the movement of River sea vessels between the inland water and sea. These issues are covered in detail under the chapter titled 'IWT and Its Integration'.	Integration of coastal shipping and IWT provides for hinterland connectivity and enhances the chances for increased coastal movement. If most of the shippers near the non-major port location have their operations along the river banks and if found viable for possible integration, the same can be looked into.	State government
Awareness	Coastal shipping is an economical and eco-friendly mode of transportation. While user community is concerned with commercial costs, it may be ignorant of the higher external social costs imposed by road / rail	Awareness needs to be created among users on the benefits of coastal shipping as well as integrated multi-modal service models. Awareness can be created amongst the user community through followings:	Central and State government

Issue / challenge	Current situation	Remedial measures	Level of intervention
	mode of transportation.	• Seminars / workshops • Media • Advertisements As coastal shipping is eco-friendly mode of transportation, a mechanism can be chalked out for providing the industrial units opting for coastal shipping mode carbon-credits. The basis of credit would be the ton-km moved by coastal shipping.	
Business risks	A relatively smaller player who might be interested in offering coastal shipping operations , may have second thoughts considering the long gestation time required for break-even. Accordingly, only existing shipping companies with adequate monetary resources may evince interest in commencing coastal operations, since it has the required capacity to absorb the loss in the initial years of operations, which a small player might not. There have been cases of shipping companies which forayed in coastal shipping, however had to shut due to non-viable operations.	The government may opt for co-funding of new start-ups of coastal shipping services and provide them the required monetary hand-holding support. The same can also be accentuated by providing the cargo support as proposed earlier. Thereafter, the operations should become self-sustainable and commercially viable. This will induct more players in the coastal shipping industry.	Central and State government
Vessel Building Subsidy Scheme	Stakeholders have demanded a vessel building subsidy scheme for river-sea vessels similar to the Inland Vessel Building Subsidy Scheme (IVBSS). Under IVBSS, 30% subsidy was payable to the entrepreneurs for construction of inland vessels built in India for operation in national waterways, Sunderbans and Indo-Bangladesh protocol routes.	A subsidy can be provided for construction of river-sea vessels for fast pace development of coastal shipping as well as inland waterways in the state. The amount of subsidy can be linked with the cargo moved by the ship owner.	Central and State government

10.3 Action plan

As outlined in the strategy road-map, there are number of actions that need to be taken for accelerated development of coastal shipping. However, not all of these actions are deemed to yield the same kind of results. Therefore, an action plan has been prepared which pictorially depicts the very high priority action points, high priority action points and low priority action items. The legend used for priority level is shown below:

Legend for **Level of priority for action items**

	High Priority Action
	Medium Priority Action
	Low priority action

The action plan also suggests the names of responsible agency along with the respective role the agency has to play. The action plan provides indicative time line for each of the action item, represented by coloured bar shown below:

Activity to be done by Directorate of Ports, Govt. of Kerala (DoP)

Activity to be done by Ministry of Finance / Shipping at Central level

Activity to be done by PPP partner

Activity to be done by other departments at state level

The action plan is furnished on following pages.

Action plan (1/4)

Action item	Agency	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14
Arrange for automated containers handling equipments like forklift, cranes, stackers, weigh bridges at Azhikkal, Beypore, Kollam	DoP, GoK	To have container handling equipments on lease hire model till the developer is selected and operations are commenced																																			
Construction of sheds / slots, godown, fuel and water supply, compound wall for containers / cargo at Azhikkal, Beypore, Kollam	DoP, GoK	To arrange for construction of slots for container cargo, the same can be provided to PPP developer and the same can be trteated as part of equity infusion by the government in the SPC incorporated to operate and manage the port																																			
Strengthening of existing berth at Kollam	DoP, GoK	Strengthening of existing berth at Kollam port																																			
Removal of shallow patches at Azhikkal	DoP, GoK	To appoint a dredging agency for removal of shallow patches at Azhikkal port																																			
Dredging at Beypore for 4 m. draft	DoP, GoK	To appoint a dredging agency for increasing of depth to at least 4 m at Beypore																																			
Construction of approach roads capable of handling container lorries at Azhikkal, Beypore, Kollam	PWD, GoK	To construct good quality approach roads provindg hinterland connectivity to non-major ports in the state																																			
	DoP, GoK	To coordinate with PWD / government departments for fast tracking of approach roads to non-major ports																																			
Development of two multipurpose cargo terminals and coastal passengers berth at Azhikkal, to include the development of berths in concession agreement	DoP, GoK				Selection of private developer cum operator	Development of two number of berths as per concession agreement and commencement of operations																				Development of passenger berth as per concession agreement and commencement of operations												
Strengthening of existing two berths and development of coastal passenger berth at Beypore, to include stregnthening and development of berths in concession agreement	DoP, GoK				Selection of private developer cum operator	Strengthening of existing berths / development of infrastructure as per concession agreement and commencement of operations																				Development of passenger berth as per concession agreement and commencement of operations												

Activitity to be done by Directorare of Ports, Govt. of Kerala (DoP)

Activitity to be done by PPP partner

Activitity to be done by MInistry of Finance / Shipping at Central level

Activitity to be done by other departments at state level

High Priority Action

Medium Priority Action

Low priority action

Action plan (2/4)

Action item	Agency	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14
Scale of rates for charges at Non-major ports to be rationalized / provided with incentives	DoP, GoK	To work out appropriate scale of rate along with incentives on cargo movement for operations at non-major ports																																			
Appoint dedicated professionals for promotion of coastal shipping in the State	DoP, GoK		To recruit Coastal Shipping Managers to be posted at Kollam, Beypore, and Azhikkal																																		
Identification and selection of logistics service providers for each of the port	DoP, GoK				Selection of integrated logistics service provider for regular services at the non-major ports and IWTs in hinterland in Kerala, provide guarantee to the selected service providers for minimum cargo through put																																		
Financing at concessional rates	Ministry of Shipping, GoI						To establish Coastal Shipping Development Fund which should be accessible for river-sea vessels																																
	Ministry of Finance / Reserve Bank of India (RBI)						To issue a directive to banks for extending finance at concessional rates for acquisition of assets for use in coastal shipping																																
	DoP, GoK						To pursue the agenda with Ministries and RBI through MSDC platform																																
Elimination of customs intervention for coastal shipping operations	Ministry of Shipping, GoI						To pursue with Ministry of Finance for elimination or rationalization of customs intervention in coastal cargo																																
	DoP, GoK						To pursue the matter with Ministry of Shipping through MSDC platform																																
Formulate a vessel building subsidy scheme for river-sea vessels	Ministry of Shipping / Ministry of Finance, GoI						To formulate vessel building subsidy scheme fro river-sea vessels																																
	DoP, GoK						To pursue the matter with Ministries through MSDC platform, alternatively DoP to formulate the subsidy scheme at state level																																
Develop incentive framework for coastal movement of goods	DoP, GoK							To formulate an incentive framework based on tons-kms moved by coastal shipping																															

Activitity to be done by Directorare of Ports, Govt. of Kerala (DoP)

Activitity to be done by PPP partner

Activitity to be done by MInistry of Finance / Shipping at Central level

Activitity to be done by other departments at state level

High Priority Action

Medium Priority Action

Low priority action

Action plan (3/4)

Action item	Agency	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14
Increase awareness about coastal shipping through seminars / workshops / advertisement	DoP, GoK				To organize seminars / workshops for increasing awareness on coastal shipping; to create promotional materials / literature on costal shipping for distribution ot cargo owners; participants to include CHAs, C&F Agents, Member Organizations of Distrcit Chambers of Commerce																																		
Promotion of specialized courses in coastal shipping training	DoP, GoK							Invite recognised maritime training institutes for setting up facilities in Kerala and offering specialised courses in coastal shipping, duly recognized by DG Shipping																																	
Computerization of operational processes	DoP, GoK																			To appoint an agency for integration / computerization of non-major ports in Kerala and enable EDI with coastal shipping stakeholders															
Formulation of state level coastal shipping policy	DoP, GoK				To formulate a state level coastal shipping policy within the purview of relevant Union Acts.																																	
Lobbying for national level coastal shipping policy	Ministry of Shipping, GoI				To prepare and implement a coastal shipping policy at national level																																	
	DoP, GoK				To pursue the matter with Ministry for fast-tracking of policy formulation and declaration																																	
Control on labour strikes in the State	Law Department, GoK				To work out the mechanism for implementation of the appropriate legislation for effective control on incidents of labour strikes in the state																																	
	DoP, GoK				To pursue the matter with Law Department; parallely to rope-in institutions / NGOs in educating the labourers about ill-effects of strikes																																	
Abatement of service tax, at least to the extent of 75% of freight	Ministry of Finance, GoI																			To exempt coastal shipping from the ambit of service tax or provide abatement of service tax at least to the extent of 75% of freight (in line with that provided for road transport)															
	DoP, GoK																			To pursue the matter with Ministry of Finance through the platform of Maritime State Development Council (MSDC)															

Activitity to be done by Directorare of Ports, Govt. of Kerala (DoP)

Activitity to be done by PPP partner

Activitity to be done by MInistry of Finance / Shipping at Central level

Activitity to be done by other departments at state level

High Priority Action

Medium Priority Action

Low priority action

Action plan (4/4)

Action item	Agency	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14
Mandatory cargo support for government shipments	Department of General Administration, GoK													To issue a circular to all the state government agencies (such as Civil Supplies, Fertilizers for agriculture use, etc.) encouraging them for routing their shipments through coastal shipping wherever feasbile																							
	DoP, GoK													To pursue the matter with General Administration Department																							
Exemption of income tax on crew manning coastal vessels	Ministry of Finance, GoI																			To exempt coastal shipping crew from the ambit of income tax for a period of 5 years																	
	DoP, GoK																			To pursue the matter with Ministry of Shipping through MSDC platform																
Lobbying for grant of infrastructure industry benefits to coastal shipping	Ministry of Shipping / Ministry of Finance, GoI																			To extend infrastructure industry benefits to coastal shipping																
	DoP, GoK																			To pursue the matter with Ministries through MSDC platform																
Reduce the VAT on bunker from 12.5% to 0.5% similar to as charged to foreign going vessels at multi-user liquid terminal, Cochin	Department of Commercial Tax, GoK										To reduce the VAT on bunker to coastal vessels																									
	DoP, GoK										To pursue the matter with Department of Commercial Tax																									
Development of coastal passenger berth at Kollam	DoP, GoK																							Development of passenger berth and facilltate commencement of operations												
Development of container cum passenger terminal at Alappuzha, to include container cum passenger terminal in concession agreement	DoP, GoK										Selection of private developer cum operator			Development of container cum passnger terminal as per concession agreement and commencement of operations																						
Promotion of setting up ship repair unit at Kodungalloor / Munambam, Ponnani	DoP, GoK																	To invite EoIs from ship repair units and provide assistance and concessions for setting up ship repair unit at a non-major port in Kerala																

Activitity to be done by Directorare of Ports, Govt. of Kerala (DoP)

Activitity to be done by PPP partner

Activitity to be done by MInistry of Finance / Shipping at Central level

Activitity to be done by other departments at state level

High Priority Action

Medium Priority Action

Low priority action

10.4 Conclusion

Coastal shipping in India as well as Kerala has the potential to soar. However, coastal shipping did not receive the required attention and has suffered serious bottlenecks on many fronts. The State government should address the challenges coming under its jurisdiction. For the issues pertaining to Central Government, the State Government should lobby strongly with other maritime states and influence the decision.

Annexure 1: Expected passengers shift for long distance travel

Table 1: Calculation of expected weekly shift of passenger traffic from rail to coastal route (Mumbai-Ernakulam-Mumbai)

Train No.	Train	Total no. of passengers per day	Weekly frequency	Total weekly passengers	Time taken for train journey - (T1)	Likely total time for coastal journey - (T2)	Time saving on opting for coastal movement (T1) - (T2)	Time saving as % of time taken by train journey	Diversion %	Expected weekly shift to coastal mode
12618	MNGLA LKSDP EXP	63	7	441	26.92	19.91	7.01	26	15%	66
16345	NETRAVATI EXP	170	7	1190	27.92	19.91	8.01	29	15%	179
16381	KANYAKUMARI EXP	55	7	385	38.25	19.91	18.34	48	25%	96
12432	TRIVNDRM RJDHNI	151	3	453	22.00	19.91	2.09	10	5%	23
12201	KCVL GARIB RATH	610	2	1220	24.42	19.91	4.51	18	10%	122
16337	OKHA ERS EXPRES	60	2	120	26.25	19.91	6.34	24	15%	18
16331	TRIVANDRAM EXP	80	1	80	37.00	19.91	17.09	46	25%	20
12484	ASR KCVL EXPRES	30	1	30	23.92	19.91	4.01	17	10%	3
12223	LTT ERS DURONTO i	590	2	1180	22.42	19.91	2.51	11	10%	118
12288	DDN KCVL SUP EX	30	1	30	23.75	19.91	3.84	16	10%	3
12520	PUNE ERS SUP	39	2	78	23.08	19.91	3.17	14	10%	8

Train No.	Train	Total no. of passengers per day	Weekly frequency	Total weekly passengers	Time taken for train journey - (T1)	Likely total time for coastal journey - (T2)	Time saving on opting for coastal movement (T1) - (T2)	Time saving as % of time taken by train journey	Diversion %	Expected weekly shift to coastal mode
	EX i									
16311	BKN KCVL EXPRES	39	1	39	25.83	19.91	5.92	23	15%	6
16333	VRL TVC EXPRESS	30	1	30	25.83	19.91	5.92	23	15%	5
12218	KERLA S KRANTI	30	1	30	23.33	19.91	3.42	15	10%	3
16335	NAGERCOIL EXP	30	1	30	25.83	19.91	5.92	23	15%	5
12998	HAPA TEN SUP EX	30	2	60	23.33	19.91	3.42	15	10%	6
12978	MARU SAGAR EXP	180	1	180	24.67	19.91	4.76	19	10%	18
12617	MANGALA LDWEEP	66	7	462	26.08	19.91	6.17	24	15%	69
16346	NETRAVATHI EXP	85	7	595	28.17	19.91	8.26	29	15%	89
16382	CAPE MUMBAI EXP	100	7	700	41.00	19.91	21.09	51	25%	175
12997	HAPA EXPRESS	30	2	60	23.58	19.91	3.67	16	10%	6
16334	VERAVAL EXPRESS	32	1	32	26.83	19.91	6.92	26	15%	5
12431	RAJDHANI EXP	18	3	54	21.00	19.91	1.09	5	5%	3
12519	ERS PUNE	39	2	78	22.67	19.91	2.76	12	10%	8

Train No.	Train	Total no. of passengers per day	Weekly frequency	Total weekly passengers	Time taken for train journey - (T1)	Likely total time for coastal journey - (T2)	Time saving on opting for coastal movement (T1) - (T2)	Time saving as % of time taken by train journey	Diversion %	Expected weekly shift to coastal mode
	EXPRES i									
16336	GANDHIDHAM EXP	30	1	30	26.83	19.91	6.92	26	15%	5
16338	OKHA EXPRESS	63	2	126	27.00	19.91	7.09	26	15%	19
12224	ERS LTT DURONTO	635	2	1270	22.25	19.91	2.34	11	10%	127
12483	AMRITSAR EXP	30	1	30	23.58	19.91	3.67	16	10%	3
12202	LTT GARIB RATH	253	2	506	24.33	19.91	4.42	18	10%	51
12287	DEHRADUN EXP	30	1	30	23.50	19.91	3.59	15	10%	3
16332	MUMBAI EXPRESS	180	1	180	37.83	19.91	17.92	47	25%	45
12217	SAMPARK KRANTHI	30	1	30	23.58	19.91	3.67	16	10%	3
16312	BIKANER EXPRESS	39	1	39	26.83	19.91	6.92	26	15%	6
12977	MARU SAGAR EXP	180	1	180	25.50	19.91	5.59	22	15%	27
									TOTAL	**1343**

Table 2: Calculation of expected weekly shift of passenger traffic from rail to coastal route (Mumbai-Trivandrum-Mumbai)

Train No.	Train	Total no. of passengers per day	Weekly frequency	Total weekly passengers	Time taken for train journey - (T1)	Likely total time for coastal journey - (T2)	Time saving on opting for coastal movement (T1) - (T2)	Time saving (as % of time taken by train journey)	Diversion %	Expected weekly shift to coastal mode
16345	NETRAVATI EXP	170	7	1190	32.25	23.16	9.09	28	15%	179
16381	KANYAKUMARI EXP	55	7	385	43.75	23.16	20.59	47	25%	96
12432	TRIVNDRM RJDHNI	151	3	453	25.75	23.16	2.59	10	10%	45
12201	KCVL GARIB RATH	430	2	860	28.83	23.16	5.67	20	10%	86
12484	ASR KCVL EXPRES	30	1	30	28.42	23.16	5.26	19	10%	3
16331	TRIVANDRAM EXP	80	1	80	41.17	23.16	18.01	44	25%	20
12288	DDN KCVL SUP EX	30	1	30	28.42	23.16	5.26	19	10%	3
16311	BKN KCVL EXPRES	39	1	39	30.33	23.16	7.17	24	15%	6
16333	VRL TVC EXPRESS	30	1	30	30.33	23.16	7.17	24	15%	5
12218	KERLA S KRANTI	30	1	30	27.58	23.16	4.42	16	10%	3
16335	NAGERCOIL EXP	30	1	30	30.17	23.16	7.01	23	15%	5
12998	HAPA TEN SUP EX	30	2	60	27.08	23.16	3.92	14	10%	6

Train No.	Train	Total no. of passengers per day	Weekly frequency	Total weekly passengers	Time taken for train journey - (T1)	Likely total time for coastal journey - (T2)	Time saving on opting for coastal movement (T1) - (T2)	Time saving (as % of time taken by train journey)	Diversion %	Expected weekly shift to coastal mode
16346	NETRAVATHI EXP	85	7	595	32.08	23.16	8.92	28	15%	89
16382	CAPE MUMBAI EXP	100	7	700	46.08	23.16	22.92	50	25%	175
12997	HAPA EXPRESS	30	2	60	27.00	23.16	3.84	14	10%	6
16334	VERAVAL EXPRESS	32	1	32	31.33	23.16	8.17	26	15%	5
12431	RAJDHANI EXP	282	3	846	24.08	23.16	0.92	4	5%	42
16336	GANDHIDHAM EXP	30	1	30	31.33	23.16	8.17	26	15%	5
12483	AMRITSAR EXP	30	1	30	27.00	23.16	3.84	14	10%	3
12202	LTT GARIB RATH	72	2	144	28.17	23.16	5.01	18	10%	14
12287	DEHRADUN EXP	30	1	30	27.33	23.16	4.17	15	10%	3
16312	BIKANER EXPRESS	39	1	39	31.33	23.16	8.17	26	15%	6
16332	MUMBAI EXPRESS	20	1	20	41.83	23.16	18.67	45	25%	5
12217	SAMPARK KRANTHI	30	1	30	27.00	23.16	3.84	14	10%	3
									TOTAL	813

Table 3: Calculation of indicative incremental cost of coastal movement vis-à-vis rail transport (Mumbai-Ernakulam-Mumbai)

Amounts in ₹

Train No.	Train	Rail Movement			Coastal Movement			Incremental cost of coastal movement
		Average fare for train journey	Cost associated with last mile connectivity	Total cost for train travel	Indicative fare for coastal journey	Cost associated with last mile connectivity	Total cost of opting for coastal movement	
12618	MNGLA LKSDP EXP	1431	200	1631	3633	172	3805	2174
16345	NETRAVATI EXP	1401	200	1601	3633	172	3805	2204
16381	KANYAKUMARI EXP	1533	200	1733	3633	172	3805	2072
12432	TRIVNDRM RJDHNI	2185	200	2385	3633	172	3805	1420
12201	KCVL GARIB RATH	641	200	841	3633	172	3805	2964
16337	OKHA ERS EXPRES	1375	200	1575	3633	172	3805	2230
16331	TRIVANDRAM EXP	1481	200	1681	3633	172	3805	2124
12484	ASR KCVL EXPRES	1405	200	1605	3633	172	3805	2200
12223	LTT ERS DURONTO i	2298	200	2498	3633	172	3805	1307
12288	DDN KCVL SUP EX	1187	200	1387	3633	172	3805	2418
12520	PUNE ERS SUP EX i	1375	200	1575	3633	172	3805	2230
16311	BKN KCVL EXPRES	1375	200	1575	3633	172	3805	2230
16333	VRL TVC EXPRESS	1375	200	1575	3633	172	3805	2230
12218	KERLA S KRANTI	1851	200	2051	3633	172	3805	1754
16335	NAGERCOIL EXP	1375	200	1575	3633	172	3805	2230
12998	HAPA TEN SUP EX	1187	200	1387	3633	172	3805	2418
12978	MARU SAGAR EXP	1851	200	2051	3633	172	3805	1754

Amounts in ₹

Train No.	Train	Rail Movement			Coastal Movement			Incremental cost of coastal movement
		Average fare for train journey	Cost associated with last mile connectivity	Total cost for train travel	Indicative fare for coastal journey	Cost associated with last mile connectivity	Total cost of opting for coastal movement	
12617	MANGALA LDWEEP	1431	200	1631	3633	172	3805	2174
16346	NETRAVATHI EXP	1401	200	1601	3633	172	3805	2204
16382	CAPE MUMBAI EXP	1520	200	1720	3633	172	3805	2085
12997	HAPA EXPRESS	1187	200	1387	3633	172	3805	2418
16334	VERAVAL EXPRESS	1375	200	1575	3633	172	3805	2230
12431	RAJDHANI EXP	2382	200	2582	3633	172	3805	1223
12519	ERS PUNE EXPRES i	1375	200	1575	3633	172	3805	2230
16336	GANDHIDHAM EXP	1375	200	1575	3633	172	3805	2230
16338	OKHA EXPRESS	1375	200	1575	3633	172	3805	2230
12224	ERS LTT DURONTO	2298	200	2498	3633	172	3805	1307
12483	AMRITSAR EXP	1405	200	1605	3633	172	3805	2200
12202	LTT GARIB RATH	641	200	841	3633	172	3805	2964
12287	DEHRADUN EXP	1187	200	1387	3633	172	3805	2418
16332	MUMBAI EXPRESS	1481	200	1681	3633	172	3805	2124
12217	SAMPARK KRANTHI	1851	200	2051	3633	172	3805	1754
16312	BIKANER EXPRESS	1375	200	1575	3633	172	3805	2230
12977	MARU SAGAR EXP	1851	200	2051	3633	172	3805	1754

Table 4: Calculation of indicative incremental cost of coastal movement vis-à-vis rail transport (Mumbai-Trivandrum-Mumbai)

Amounts in ₹

Train No.	Train	Rail Movement			Coastal Movement			Incremental cost of coastal movement
		Average fare for train journey	Cost associated with last mile connectivity	Total cost for train travel	Indicative fare for coastal journey	Cost associated with last mile connectivity	Total cost of opting for coastal movement	
16345	NETRAVATI EXP	1520	175	1695	4423	172	4594	2899
16381	KANYAKUMARI EXP	1625	175	1800	4423	172	4594	2794
12432	TRIVNDRM RJDHNI	2665	175	2840	4423	172	4594	1754
12201	KCVL GARIB RATH	708	175	883	4423	172	4594	3711
12484	ASR KCVL EXPRES	1511	175	1686	4423	172	4594	2908
16331	TRIVANDRAM EXP	1586	175	1761	4423	172	4594	2833
12288	DDN KCVL SUP EX	1286	175	1461	4423	172	4594	3133
16311	BKN KCVL EXPRES	1493	175	1668	4423	172	4594	2926
16333	VRL TVC EXPRESS	1493	175	1668	4423	172	4594	2926
12218	KERLA S KRANTI	1992	175	2167	4423	172	4594	2427
16335	NAGERCOIL EXP	1493	175	1668	4423	172	4594	2926
12998	HAPA TEN SUP EX	1286	175	1461	4423	172	4594	3133
16346	NETRAVATHI EXP	1520	175	1695	4423	172	4594	2899
16382	CAPE MUMBAI EXP	1625	175	1800	4423	172	4594	2794
12997	HAPA EXPRESS	1286	175	1461	4423	172	4594	3133
16334	VERAVAL EXPRESS	1493	175	1668	4423	172	4594	2926

Amounts in ₹

Train No.	Train	Rail Movement			Coastal Movement			Incremental cost of coastal movement
		Average fare for train journey	Cost associated with last mile connectivity	Total cost for train travel	Indicative fare for coastal journey	Cost associated with last mile connectivity	Total cost of opting for coastal movement	
12431	RAJDHANI EXP	2650	175	2825	4423	172	4594	1769
16336	GANDHIDHAM EXP	1493	175	1668	4423	172	4594	2926
12483	AMRITSAR EXP	1511	175	1686	4423	172	4594	2908
12202	LTT GARIB RATH	708	175	883	4423	172	4594	3711
12287	DEHRADUN EXP	1286	175	1461	4423	172	4594	3133
16312	BIKANER EXPRESS	1493	175	1668	4423	172	4594	2926
16332	MUMBAI EXPRESS	1586	175	1761	4423	172	4594	2833
12217	SAMPARK KRANTHI	1992	175	2167	4423	172	4594	2427

Annexure 2: Expected passengers shift for short distance travel

Table 1: Calculation of expected weekly shift of passenger traffic from road to coastal route

Time in decimal hours

Sr. No	O-D Pair	No. of passengers per day	Weekly no. of passengers	Avg time for road travel (T1)	Time taken for last mile journey (A)	Time for coastal journey (B)	Waiting time at ports (C)	Likely total time for coastal movement (T2) = (A) + (B) + (C)	Time saving (T1) - (T2)	Time saving (as a % of avg time taken for road jny)	Diversion %	Expected weekly shift to coastal mode
1	Kozhikode - Kannur	780	5460	2.66	0.75	1.42	1.00	3.17	-0.51	-19	0%	0
2	Ernakulam - Kannur	2950	20650	8.11	0.98	3.34	1.00	5.32	2.80	34	10%	2065
3	Kollam - Kannur	520	3640	12.20	0.76	5.26	1.00	7.01	5.19	43	20%	728
4	Thiruvananthapuram - Kannur	520	3640	14.11	0.98	6.39	1.00	8.37	5.74	41	20%	728
5	Ernakulam - Kozhikode	2950	20650	5.43	0.73	1.99	1.00	3.72	1.71	31	10%	2065
6	Kollam - Kozhikode	1560	10920	9.51	0.51	3.84	1.00	5.34	4.17	44	20%	2184
7	Thiruvananthapuram - Kozhikode	520	3640	11.43	0.73	4.97	1.00	6.70	4.73	41	20%	728
8	Kollam - Ernakulam	3540	24780	4.11	0.74	1.85	1.00	3.58	0.53	13	2%	496
9	Thiruvananthapuram - Ernakulam	5900	41300	6.03	0.96	3.06	1.00	5.01	1.02	17	2%	826
10	Thiruvananthapuram - Kollam	3900	27300	1.91	0.73	1.07	1.00	2.80	-0.88	-46	0%	0
											TOTAL	9820

Table 2: Calculation of indicative incremental cost of coastal movement vis-à-vis road transport

Amounts in ₹

Sr. No	O-D Pair	Total cost of road travel (C1)	Indicative cost of last mile journey (A)	Indicative fare for coastal journey (B)	Likely total cost for coastal movement (C2) = (A) + (B)	Incremental cost of coastal movement (C2) - (C1)
1	Kozhikode - Kannur	173	30	345	375	202
2	Ernakulam - Kannur	528	49	811	860	331
3	Kollam - Kannur	794	30	1277	1307	512
4	Thiruvananthapuram - Kannur	919	49	1553	1601	682
5	Ernakulam - Kozhikode	353	39	483	522	168
6	Kollam - Kozhikode	619	20	932	952	332
7	Thiruvananthapuram - Kozhikode	744	39	1208	1246	502
8	Kollam - Ernakulam	268	39	449	488	220
9	Thiruvananthapuram - Ernakulam	392	57	742	799	407
10	Thiruvananthapuram - Kollam	125	39	259	298	173

Annexure 3: Response to feedback on the draft report

#	Feedback / remarks	Response	Reference
I	**Diversion matrix needs clarification on the following point**		
1	The costs of two additional handling were taken into account	Yes. The cost of additional handling at the two ports has been incorporated.	Please refer to section *4.2.4.2.3 Coastal freight* on page 39 & 40.
2	The cost due to damage/loss taken into account	Yes. The damages and losses due to accidents on road have higher costs as compared to coastal shipping and have been duly incorporated	Please refer to section 9*.1.7 External costs* on page 97.
3	The difference in insurance premium of the cargo by sea and road	The difference is insurance premium for cargo movement by sea and by road is insignificant. As per our interactions with insurance sector players, the difference would be 0.1% at maximum.	
II	**Coastal movement of passengers**		
1	The only advantage for passengers of coastal movement suggested is time saving. This need to be elaborated. It is impractical to operate catamaran of speed 44 knots in the coastal water due to density fishing boats.	Yes. The direct advantage of coastal movement for passenger is time savings. However, there are other indirect benefits to passengers such as: a) utility of using a modern service b) absence of mental stress from encountering road traffic and c) a hassle-free journey. d) At a broader level, society gets benefited from lower pollution, and efficiency gains which will get translated into economic savings for the State. It is agreed that there might be fishing trawlers scattered in the coastal waters. However, this would not be for the entire stretch of the shores. . Coastal vessels will ply on a properly marked channel which will be clear of such hurdles while at sea. The navigational route/s has to be surveyed and finalized. Once finalized, no activities other than those related to coastal shipping would be permitted on such channels / routes. This will ensure that	

#	Feedback / remarks	Response	Reference
		the desired navigation channel is fully available for the operations and thereby achieving the optimal speed. The navigational route should be clearly identified with markers and directions at appropriate junctures. It has to be noted that the average speed of catamarans has increased significantly as compared to its predecessors. The catamarans delivered in recent past are known to have speed varying from 37 knots to 44 knots. Based on our interactions with M/s Austal, a leading Catamaran design and manufacturer from Australia, a 41 m catamaran would be suitable for the intended operations. This catamaran is likely to achieve service speed of 38 knots in the Indian coast.	
2	This catamaran can be operated during monsoon is to be confirmed	Yes. The catamaran can be operated during monsoon. However, the operational speed would need to be lowered during monsoon, depending upon the weather conditions. Nevertheless, adverse conditions during some days of the monsoon may result into some of the services being suspended which may in turn lead to non-operating of vessel altogether. For example, the catamaran can maintain 43 knots in waves up to about 1 metre height and progressively slow down as wave heights increase before ceasing operations if the wave height is equal to or greater than 3 metres. So whether or not the vessel can operate during the monsoon depends on the wave heights that it will encounter during that time and the speed at which the service can be maintained. The above relates to limits imposed by the Classification Society for structural safety of the vessel. Passenger comfort is another consideration. While the vessel might be permitted to operate at up to 21 knots in 2.5 metre seas it might still be very uncomfortable for passengers depending on the angle of approach of the waves. A detailed study for passenger safety and comfort may need to be undertaken once this project is given the green signal.	
3	The factor of passengers likely to become seasick within further reduce the passengers, interest in sea journey	This is true. This is one of the reasons why the likely shift of passenger has been considered very low (2 to 5% for time savings up to 30%). Whereas this can be an issue in the initial days, over a period of time, passengers are expected to get used to this unique mode of travel.	Please refer to *section 5.2 Short distance passengers travelling within Kerala,* on page

#	Feedback / remarks	Response	Reference
			61, *table 5-12 Criterion for determining likely shift from road to coastal route* on page 64.
III	**Ro-Ro Coastal shipping** is not considered. This could be advantageous for coastal shipping in Kerala for the following reasons. 1) Being a consumer state, the parcels are generally small and no much return cargo available. 2) The projection show increase in container coastal traffic. Most of the minor ports in Kerala is not equipped to handle containers. Investment in terms of draft and handling equipments is very high. The Ro-Ro vessels normally have low draft and do not require handling equipment and a study in this respect need to be conducted	Ro-Ro operations are practically feasible for relatively shorter distances, which can be covered in maximum 8-10 hours. The container traffic to Kerala is mainly originating from Rajasthan and Gujarat. The sea voyage itself takes around 2.5-3 days from Gujarat to Cochin. Apart from the voyage time, the dwell time at port may take another couple of days. The cargo loaded in container need not be manned, whereas the trucks would need to manned (drivers / cleaners). Over the long distance, this creates following main problems for the operations: a. Waste of economic resource of the nation by virtue of idle time of drivers / cleaners b. Feeling of boredom for drivers / cleaners and lack of activities for a span of 4 to 5 days c. Increased cost of operations due to: i. **Lower payloads**: While an 8000 tons payload vessel can carry about 7000 tons of cargo load by using containers, it will be able to carry only 5300 tons cargo load by loading trucks. This is because tare weight of a 10 tons truck is around 5 tons while that of a container is 2 tons. Moreover, average cargo load per container is about 15 tons. Containerized transport is much more efficient than break-bulk transport. As a thumb rule, around 3 break-bulk shipments by truck is considered equivalent to 1 container shipment by truck[7]. ii. **Less number of units**: Containers can be stacked upon one another and thereby the space required to accommodate a particular number of containers is less than the space required to	

[7] Project Report titled '*Intermodal Transport Services to the Interior Project" for a* Canadian International Development Agency (CIDA) funded project

#	Feedback / remarks	Response	Reference
		accommodate same number of trucks. Therefore, the number of trucks a vessel can carry reduces dramatically. Currently, a coastal vessel from Gujarat to Kerala carries around 450 TEUs per trip. To transport the same cargo on trucks by using Ro-Ro vessels would mean either very large vessel or multiple trips. iii. **Truck charges while on board ship**: Even when the truck is being moved on Ro-Ro vessel, the truck operator would charge a specific amount per day for idle usage of the truck. These would be additional cost apart from the charges incurred by the Ro-Ro vessel for ferrying the truck & its payload to the intended destination. As noted above, logistics and external costs of cargo movement using Ro-Ro vessel operations are significantly more than that by using container vessels for coastal shipping. At best, Ro-Ro facility could be used for intra-state movement within Kerala where there is a bulk movement of goods from north to south of Kerala and vice versa	
IV	**Availability of small size ships** on coastal traffic need to be studied. Most of the minor ports in Kerala have draft of the range 3-5 meters. Availability of Indian ships of this range are very low and hence the freights are high. This fact should be considered. Alternatively Ro-Ro vessels even though have comparatively higher freight; the reduction in handling of cargo, point-to-point delivery of cargo etc. will compensate this.	Details on availability of coastal vessels have been discussed under the *Chapter 7 Coastal fleet*. Desired growth in coastal fleet has not taken place. However, with advent of river-sea vessels which will have draft in the range of 3-5 meters, the supply should not be an issue going forward. With regards to availability of Ro- Ro coastal vessels, there is only 1 Ro-Ro vessel registered in India. Moreover, this vessel is 1983 make. It can be deduced that the Ro-Ro vessel operations are either not popular or not in demand. As per analysis, the resultant savings, due to absence of additional handling charges, falls short to offset the differential in freight cost.	

#	Feedback / remarks	Response	Reference
V	**Charges & time**		
1	Whether you have taken the unloading & loading, carnage (crane) charges, port charges etc for cargo in loading port and unloading port while calculating the transportation cost?	Yes. Additional charges have been considered in the cost analysis. Accordingly, the traffic forecast has been revised.	Please refer to section *4.2.4.2.3 Coastal freight* on page 39 & 40.
2	How we can reduce the cargo movement time in loading and unloading ports	Currently, the cargo movement at ports takes relatively higher time because of underdeveloped infrastructure facilities. To reduce the cargo movement time at ports, the infrastructural facilities as suggested in strategy road map needs to be created at ports. Creation of suggested infrastructural facilities would enhance the capacity and efficiency at the ports.	Please refer to following sub-sections of the table under section *10.2 Strategy road map cum action plan:* • Ports & related infrastructure • Cargo handling equipments • Space for infrastructure development • Last mile connectivity
3	Who will execute the cargo movement in the loading and unloading port, once vessel schedule is fixed and material handling equipments ready in the port?	The referred cargo movement can be outsourced to reliable, experienced and reputed Third Party Logistics (3PL) service providers. The relevant Port operator for the concerned port could also provide the desired service.	Please refer to following sub-sections of the table under section *10.2 Strategy road map cum action plan:* • Regular and integrated coastal services to non-major ports

#	Feedback / remarks	Response	Reference
VI	**Project cost & Source of funding**		
1	Anticipated cost for additional infrastructure required for costal shipping stated as Azhikkal-75crore, Beypore-6 crore, Kollam-40 crore and Allapuzha-299.5 core. Additional Cost required for Alappuzha port seems to be too high. Hence explore the possibility of one berth (suitable) of Cochin port Trust can be used for coastal shipping.	The cost for Alappuzha is high owing to the need for creation of break waters. As of today, unlike other ports of Kerala such as Kollam and Azhikkal, there is no protection available to vessels at Alappuzha either though a natural or a man-made breakwater. In a separate study related to the development of Alappuzha port, a business case has been separately worked out as regards the creation of a breakwater for purposes of all round development of a cargo-cum-marina-cum tourist facility in the state. It has also been pointed out in the study that such cost of a breakwater should be provided by the Government as a grant rather than as a capital cost towards creation of port related infrastructure to be recovered from cargo (coastal as well as imports / exports). Cochin port has been considered for coastal shipping by the consultants. This would do away the investment requirement on State Government's part. The State Government can discuss the need for coastal shipping with Cochin Port Trust for having dedicated berths for coastal shipping. Alappuzha port has been suggested in lieu of Cochin port only, considering the strategic interests of the State Government and the possibility that Cochin Port Trust does not provide for adequate coastal shipping infrastructure.	Please refer section *4.2.4.2.1 Unloading port.*
2	High degree of coordination effort is essentially required for the smooth flow of cargo (avoid delay in O-D pairs). This aspect is not seen examined thoroughly and remedial measures also suggested. Since any delay in connected ports (O-D pairs) will loose the benefit of coastal shipping as a whole, The time and money saving through coastal shipping is not substantial at the present scenario	Currently, smooth flow of the cargo is restricted due to bottlenecks in logistic chain resulting from absence of integrated logistics service providers and streamlined procedural formalities. The logistics service industry is fragmented with large number of smaller players. However, during past few years, integrated logistics service providers have emerged and many of existing logistics companies have evolved various service offerings to match the standards provided by their new peers. This would take care of coordination part. Once this happens, the time taken for moving goods from origin to destination would become similar to that by road. Computerization can reduce the time taken in procedural clearances. As	Please refer to following sub-sections of the table under section *10.2 Strategy road map cum action plan:* • Regular and integrated coastal services to non-major ports • Transit time

#	Feedback / remarks	Response	Reference
		stated in strategy road-map, This computerization should offer different modules for users, port authorities, shipping companies and government officials. These modules should be integrated with each other in a process flow model, so that the information can travel seamlessly and can be accessed by relevant person, anytime. The computerization should streamline formalities and provide a platform for speedy clearance of the cargo. The time savings is not the primary reason for shifting of goods from road to coastal shipping. Shippers would be ready to opt for coastal shipping which is economical even if takes reasonable extra time. While calculating savings by opting for coastal shipping, prevailing costal freight rates have been used. However, the coastal freight rate is expected to go down in future owing to operations by river-sea vessels as well as increased competition. Therefore, the quantum of savings would be more.	• Documentation
3	The total cost of the take-off of the project not indicated and financial viability also not seriously examined	Broad cost estimates have been furnished in *Chapter 6 Infrastructure*. Financial viability can be done for individual ports as and when the Government approves the roadmap & the related action plan, and consequent projects for each port are drawn up for implementation. It is not possible, nor is it envisaged as a part of the scope of work for this engagement, that the entire coastal shipping industry of Kerala be evaluated in terms of financial viability.	Please refer to *Chapter 6 Infrastructure.*
4	Source of funding not identified and indicated where as this is the one of the scope of the assignment	Sources of funding have been outlined in strategy road map.	Please refer to following sub-sections of the table under section *10.2 Strategy road map cum action plan:* • Lack of government support • Cargo handling equipments

<table>
<tr><th>#</th><th>Feedback / remarks</th><th>Response</th><th>Reference</th></tr>
<tr><td>VII</td><td>Parawise remark</td><td></td><td></td></tr>
<tr><td>1</td><td>There is no oil import from Mormugao and Tuticorin
From Mumbai Port large quantity of POL (Crude) is imported</td><td>Consultants have procured data from Cochin Customs which show small volumes of POL imports from Mormugao and Tuticorin port.</td><td></td></tr>
<tr><td>2</td><td>Freight rate above 1,800 Km (Road) Rs.1.7/MT/Km The Mileage of a IOT carrying Truck is around 4Km/hr. By carrying IOT for 4Km vehicle will earn Rs.68/-. Out of this Rs.42 will go for Diesel with Rs.26/-, maintenance, Driver's salary and profit</td><td>Freight rates have been derived based on interaction with road transport operators across various cities in the country. A simple analysis of profitability is furnished in table below for transportation by road for a distance having a lead of 2000 km. Major costs such as fuel, maintenance and driver's salary have been accounted for. As shown in table, for a trip having a lead of 2000 km, Rs. 9300[8] is contributed to the gross margin.

<table>
<tr><th>Description</th><th>Row #</th><th>Lead 2000km</th></tr>
<tr><td>Load (tons)</td><td>A</td><td>10</td></tr>
<tr><td>Distance (km)</td><td>B</td><td>2000</td></tr>
<tr><td>Rate (Rs./MT/KM)</td><td>C</td><td>1.7</td></tr>
<tr><td>Freight (Rs.)</td><td>D = B x C</td><td>34000</td></tr>
<tr><td>Mileage (km/ltr)</td><td>E</td><td>4</td></tr>
<tr><td>Fuel consumption (ltr)</td><td>F = B/E</td><td>500</td></tr>
<tr><td>Fuel rate</td><td>G</td><td>42</td></tr>
<tr><td>Fuel cost</td><td>H = F x G</td><td>21000</td></tr>
<tr><td>Journey time (days)</td><td>I</td><td>6</td></tr>
<tr><td>Driver's salary (Rs. Per month)</td><td>J</td><td>10000</td></tr>
</table>
</td><td></td></tr>
</table>

[8] Fuel cost and freight rates prevailing at the time of study / analysis

#	Feedback / remarks	Response	Reference
		Driver's cost: K = (J/30) x I = 2000 Maintenance as % of freight: L = 5% Maintenance cost: M = D x L = 1700 Cost: N = H + K + M = 24700 Gross Margin: O = D - N = 9300	
3	Catamaran with 44.1 Knots speed. The Catamaran with maximum speed of 30 Knot operating between Lakshadweep and main land is taking almost 7 hrs to cover 120 KM. That means the average speed achieved is only 17.14 Knot. On Indian coast the fishing and traffic is more and the speed will come down further. And also these type catamarans can operate only during fair weather.	As stated earlier and based on the Consultant's interactions with Austal, a catamaran in India can achieve operational speed of 38 knots. Once the navigational route is identified and declared, the fishing nets and trawlers would not be a problem. The catamarans can operate during monsoon, subject to adjustments in speed.	Please refer to sub-points 1 & 2 under point *II Coastal movement of passengers* of this document.
4	In Kerala the KSRTC Volvo is charging approximately Rs.1.1/Km (Rs.84 for Trissur to Ernakulam 76 Km)	Yes. KSRTC charges around Rs. 1.1 km for its Volvo services. However, KSRTC accounts for only 12% of passenger transport in the state, while rest of the chunk is shared by private bus operators. It has been given to understand that private bus operators charge almost double the rate. The blended rate comes to be around Rs. 2 per km.	
5	The overboard clearance of minimum 5Km is not understood.	Please note this is over board clearance of 5 m and not 5 km. This implies wherever bridges / structures are constructed over the water channels, the base of such constructions should be at least 5 m. above the water level.	
6	Avoid carriage of dangerous goods in thickly populated areas (not included).	The same has been mentioned under the section *9.1 Advantages of coastal shipping.*	Please refer to sub-section *9.1.7 External costs*.

#	Feedback / remarks	Response	Reference
7	No reference on Cabot age Law for carrier of containers from transshipment terminals to the Indian Ports.	Cabotage law has been discussed in the Chapter 10 Strategic road-map cum action plan.	Please refer to following sub-sections of the table under section *10.2 Strategy road map cum action plan:* • Cabotage law
VIII	**Traffic forecast**		
1	Commodities from Rajasthan and other remote area of Gujarat and Maharashtra have to reach Mumbai or other ports of Gujarat by road for coastal shipment whether the expenditure for the transporting, loading, unloading is accounted or not.	Yes. The transportation cost for inland movement to / from port has been considered.	Please refer to section *4.2.4 Transportation cost by coastal shipping*.
2	In the traffic forecast, distance taken from which place is not mentioned. Example: Distance from Rajasthan to center zone/north zone of Kerala are shown, but from which place of Rajasthan/Maharashtra/Gujarat not shown. The cost may differ accordingly.	The major centres of origin in each of the states are furnished in *Chapter 4 Traffic forecast*.	Please refer to section *4.2.2.1 Origins*
3	The passenger ships (speed boat) are operating from Beypore to Lakshadweep and their speed is around 25 knots. Their operation merits, demerits etc. were not studied	Boats operating between mainland and islands of Lakshadweep are mainly passenger cum cargo ships. Their speed is bound to lower than speed crafts like catamarans. Moreover, most of these ships can operate during fair weather only. These are already part of coastal movement. Keeping in view the objective of assignment, the study delves more onto the likely shift from other modes of transportation to coastal shipping.	
4	Hovercrafts area operating in Mumbai Gateway of India to Vashi through thick traffic area. Study not made about their	Hovercrafts were deployed in Mumbai for ferry services from Vashi to Gateway of India (Colaba) and Belapur to Gateway of India (Colaba). However, the same failed owing high cost of tickets.	

#	Feedback / remarks	Response	Reference
	operation	City and Industrial Development Corporation Maharashtra Ltd. (CIDCO) tried to re-launch the hovercraft services. However, the efforts have not succeeded so far.	
5	Chances of Coastal supply vessels to supply water/fuel may be studied	Coastal supply vessels are primarily meant for supplying water / fuel / ration to off-shore locations / ships. These services are ancillary in nature and are not primary source of cargo revenue for the port. As non-major ports in Kerala do not have off-shore facilities to serve, chances of coastal supply vessels are minuscule. Cochin port already has arrangements for supply of necessities including fuel to vessels.	
6	Dredging of inland waterways to be studied whether it is possible to carry out.	The primary subject of the assignment is coastal shipping. As part of the study, possibility of linking inland waterways with coastal shipping has been explored. The study also suggests need for dredging of inland waterways. However, the pros and cons of dredging of inland waterways is technical subject in nature and not part of the study.	
VII	**Detailed Action Plan**		
1	Detailed action plan on who will do, what, when, where at or with what resources may be detailed with a PERT chart	An action plan with timelines and responsible agency names has been furnished under the *section 10.3 Action plan* in *Chapter 10 Strategic road map cum action plan*. The chart indicates the activities along with priority level, the corresponding time line and the entities that should be entrusted to undertake the task has been chalked out.	Please refer to *section 10.3 Action plan* in *Chapter 10 Strategic road map cum action plan.*
2	All other comments received while presenting at the Directorate on 02-04-2011may be considered. You may also refer to the initial action plan prepared by the Directorate during 2010 for a discussion at Government level (copy as note for discussion on 15.07.2010 enclosed) and the minutes of the meeting held on 14.07.2010 to discuss this action plan (copy enclosed). You are also encouraged to contact the	All the comments and relevant points have been considered and accordingly incorporated in the report. For seeking further insights / information, appropriate stakeholders have been consulted, to the extent possible through telephone. As is the normal practice, the final report could be further released on the website for stakeholders to provide their valuable comments.	

#	Feedback / remarks	Response	Reference
	relevant/important participants from among the 141 identified ones to the proposed workshop on coastal shipping at Cochin to elicit more information and insights on the subject		

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