

# COMPARATIVE ANALYSIS OF VIZHINJAM PORT WITH OTHER NEIGHBOURING TRANSHIPMENT PORTS

*Project report submitted for partial fulfilment of the requirement for the  
degree of*  
Master Of Business Administration

**(PORT AND SHIPPING MANAGEMENT)**

*By*

GANGA SANKAR

**Registration No.: 2105304002**

*Under the Supervision of*  
Ms. AMRITHA CS  
Assistant Professor



SCHOOL OF MARITIME MANAGEMENT  
INDIAN MARITIME UNIVERISTY  
Kochi CAMPUS  
MAY 2023

## DECLARATION

The project titled “COMPARATIVE ANALYSIS OF VIZHINJAM PORT WITH OTHER NEIGHBOURING TRANSHIPMENT PORTS” has been carried out under the direction of Asst. Professor Ms. Amritha CS in partial fulfilment of the requirements for the award of the degree of Master of Business Administration in International Transportation and Logistics Management to be submitted to the School of Maritime Management, Indian Maritime University, Kochi Campus.

Place:

Date:

**GANGA SANKAR**



## CERTIFICATE

This is to certify that **MS. GANGA SANKAR** (Reg, No. 2105304002) student of MBA – **Port and Shipping Management**, Indian Maritime University, Kochi has successfully completed her project titled **“COMPARATIVE ANALYSIS OF VIZHINJAM PORT WITH OTHER NEIGHBOURING TRANSHIPMENT PORTS”**.

Ms. Amritha CS  
Associate professor  
School of Maritime Management  
INDIAN MARITIME UNIVERSITY  
Kochi Campus

## ACKNOWLEDGEMENT

It gives immense pleasure to express my thanks to all those who helped for the successful completion of this project. First and foremost, I thank the God Almighty for his gracious guidance throughout the project work.

I express my sincere thanks to **Dr. YOGAMALA H L, Head, School of Maritime Management, Indian Maritime University.**

I wish to show my gratitude to **Ms AMRITHA CS, Assistant Professor, School of Maritime Management, Indian Maritime University - Kochi Campus,** for his enormous encouragement, help, guidance, throughout the period of my project and led this work to its successful completion.

I wish to express my profound senses of gratitude to my faculty members of school of Maritime Management, Indian Maritime University, Kochi Campus for giving me an opportunity to take this project.

Finally, I take the opportunity to show my gratitude to everyone who has contributed in this effort in numerous ways and their invaluable guidance and assistance through the entire phase of this project.

## Executive Summary

The vital role played by ports in the transport of goods from county to country is well recognized. Ports are inevitable in the international trade of most commodities. Their crucial role in goods transportation via sea route across the world is growingly becoming important because of the ever-expanding global trade in the ongoing era of globalization. In India, major ports come under the Ministry of Shipping. There are 12 major Ports and 205 minor ports in the country.

Ports are an important part of the global and regional freight supply chain and transport network. As port activities have a significant impact on the economic growth of these countries, it is necessary to constantly analyse and plan port activities, anticipate market changes and improve the ability of ports to withstand the growing general competitive pressure. The project analyses studies conducted by researchers on the topic of seaports, thus, and find that there are no analyses comparing more than two ports. This study consists of comparison of Vizhinjam Port with that of the neighbouring transshipment ports, namely Vallarpadam ICTT and Colombo Port.

In this study various aspects such as hinterland connectivity, maximum draft, weather condition, infrastructure availability, etc of ICTT Kochi and Colombo Port have been analysed and compared with Vizhinjam Port to find out the possibility of Vizhinjam port being successful after its completion. As per the current circumstances, Colombo port has been diverting the potential market from India towards itself due to lack of infrastructure and its own strategic positioning. Colombo Port has been in the transshipment business for over a decade now and is very successful in the case of efficiency. But one of the major deficits it carries is the congestion. Vallarpadam which is a recent establishment, had tried to divert the congestion and potential market towards itself, but due to the lack of infrastructure and lesser draft, it was not able to be as successful as previously predicted. Vizhinjam Port is developed to be a transshipment port to compete with Colombo port with its strategic location and also the deeper draft allows it accommodate more bigger vessels in the future. But Colombo

port is a well-established port with a history of transshipment. If the new Vizhinjam Port is able to divert the transshipment market from Colombo Port to itself, this will lead to a major economic growth in India. But with the current infrastructure of Vizhinjam port, it will definitely take a much longer journey to reach the capacity of Colombo port. Vizhinjam if working together with Vallarpadam Terminal and the new Enayam project, might be able to divert the traffic towards India if viewed in a bigger perspective. A much bigger opportunity for India is the Transshipment port in the Galathea Island of Great Nicobar, in Andaman and Nicobar Island which is to be completed in 2028 as of now. These are the opportunities to India to the economic growth as well its growth in the Shipping sector.

## TABLE OF CONTENTS

Executive Summary.....	- 4 -
Introduction .....	- 8 -
World Market .....	- 8 -
Indian Market .....	- 9 -
Market in Kerala.....	- 10 -
Industry Profile.....	- 12 -
What is a Port?.....	- 12 -
Ports and economic development.....	- 12 -
Transshipment.....	- 13 -
LITERATURE REVIEW.....	- 16 -
INDUSTRY PROFILE.....	- 19 -
VIZHINJAM PORT .....	- 19 -
General .....	- 19 -
Meteorological data.....	- 23 -
Transport Linkages and External Infrastructure .....	- 25 -
Vizhinjam Port as a Game changer .....	- 28 -
ICTT, Cochin Port.....	- 30 -
General .....	- 30 -
Location .....	- 31 -
Geographic conditions.....	- 32 -
Connectivity .....	- 33 -
Development path.....	- 33 -
COLOMBO PORT .....	- 35 -
General .....	- 35 -

Location .....	- 36 -
Geographical data.....	- 37 -
<b>DATA ANALYSIS .....</b>	<b>- 39 -</b>
Advantages Of Vizhinjam Port .....	- 39 -
Disadvantages Of Vizhinjam Port.....	- 40 -
Advantages Of Colombo Port .....	- 42 -
Disadvantages Of Colombo Port.....	- 43 -
Advantages Of ICTT, Kochi .....	- 44 -
Disadvantages Of ICTT, Kochi.....	- 46 -
Vizhinjam Port Vs Colombo Port .....	- 47 -
Vizhinjam Port VS International Container Transhipment Terminal, Kochi	- 49 -
Comparison between ICTT, Kochi, Colombo Port And Vizhinjam Port .....	- 50 -
<b>CONCLUSION .....</b>	<b>- 53 -</b>
<b>BIBLIOGRAPHY .....</b>	<b>- 55 -</b>
<b>WEBSITES.....</b>	<b>- 55 -</b>

## Introduction

### World Market

Transshipment refers to the practice of transferring cargo from one vessel to another at an intermediate port, typically during the course of a long-haul journey. It is a common practice in international shipping and plays a crucial role in global trade, facilitating the movement of goods between different regions and optimizing shipping routes and vessel utilization. Several ports around the world serve as major Transshipment hubs due to their strategic geographic locations, infrastructure capabilities, and connectivity to global shipping routes. These hubs are typically located at key maritime chokepoints, such as the Panama Canal, Suez Canal, and Straits of Malacca. Some of the major Transshipment hubs include Singapore, Rotterdam, Hong Kong, Busan, Tanjung Pelepas, and Colombo.

Transshipment has been growing steadily in recent years, driven by factors such as increasing containerization, larger vessel sizes, and changing trade patterns. Transshipment allows shipping lines to consolidate cargo from multiple origins and destinations, achieving economies of scale, reducing costs, and improving service reliability. It also enables them to bypass ports with limitations on vessel size, draft, or other constraints. There is intense competition among Transshipment hubs to attract shipping lines and capture a larger share of the Transshipment market. Ports invest heavily in infrastructure development, including deepening of berths, expansion of container terminals, and improving connectivity to hinterland regions. They also offer incentives, such as reduced tariffs, streamlined customs procedures, and value-added services, to attract transshipment business. Transshipment operations also face challenges, including potential delays, increased handling costs, and additional risks associated with cargo transfers. Transshipment hubs need to invest in advanced technologies, efficient terminal operations, and streamlined logistics processes to minimize these challenges and ensure smooth cargo flow.

Transshipment can also have environmental impacts, including air emissions from vessels and terminal equipment, as well as potential impacts on local marine ecosystems. Ports and shipping lines are increasingly focusing on sustainable practices, such as shore power, emission controls, and environmental certifications, to mitigate these impacts. The Transshipment scenario is also being influenced by technological disruptions, such as automation, digitization, and blockchain. These technologies have the potential to transform Transshipment operations, making them more efficient, transparent, and secure. For example, automated container terminals can handle larger volumes of cargo with minimal human intervention, while blockchain can provide enhanced visibility and traceability in supply chains. Trade and political factors, such as trade disputes, tariffs, and geopolitical tensions, can also impact the Transshipment scenario. Changes in trade patterns or political dynamics may result in shifts in Transshipment routes, volumes, and market dynamics.

## **Indian Market**

The transshipment scenario in India has been evolving in recent years, with efforts to develop transshipment hubs and optimize the movement of goods through its ports. India has a strategic geographic advantage, with its location on the major shipping routes connecting Asia, Europe, and the Middle East. This makes it an ideal location for Transshipment operations, allowing shipping lines to consolidate cargo from multiple origins and destinations. India has been focusing on the development of Transshipment hubs to attract more Transshipment business. Ports such as Mundra, Krishnapatnam, and Chennai have been identified as potential Transshipment hubs due to their deep drafts, modern infrastructure, and connectivity to global shipping routes.

The Indian government has launched several initiatives to promote Transshipment, including the Sagarmala program, which aims to develop port infrastructure and improve port connectivity. The Ministry of Shipping has also issued guidelines for Transshipment operations, including simplified procedures and reduced tariffs, to attract more Transshipment business. Ports in India are investing in infrastructure development

to support Transshipment operations. This includes deepening of berths, expansion of container terminals, and improvement of hinterland connectivity through road and rail networks. Efforts are also being made to optimize terminal operations, reduce handling costs, and improve turnaround times. Private sector participation is also playing a key role in the development of Transshipment hubs in India. Several ports have formed partnerships with international terminal operators to leverage their expertise in terminal operations and attract more Transshipment business.

Technological advancements, such as automation, digitization, and real-time visibility, are being adopted in Indian ports to improve Transshipment operations. Automated container terminals, electronic data interchange, and online payment systems are being implemented to streamline processes, reduce delays, and enhance efficiency.

The Transshipment scenario in India also faces challenges, including competition from established Transshipment hubs in the region, lack of adequate hinterland infrastructure, and regulatory hurdles. In addition, environmental concerns, such as air emissions from vessels and terminal equipment, are also being addressed through sustainability initiatives. The Transshipment scenario in India is expected to grow in the coming years, driven by increasing containerization, changing trade patterns, and infrastructure development. The Indian government's focus on port-led development and private sector participation is expected to further boost Transshipment operations in the country.

## **Market in Kerala**

The Transshipment market in Kerala, a state in southern India, is relatively new and evolving. Kerala has two major ports that serve as potential Transshipment hubs - the International Container Transshipment Terminal (ICTT) in Kochi and the upcoming Vizhinjam Port.

The ICTT in Kochi, operated by DP World, is the first Transshipment terminal in India and has been operational since 2011. It has a strategic location on the west coast of India, with proximity to international shipping routes. The ICTT has modern infrastructure, including deep berths, advanced handling equipment, and a dedicated

rail-road network, making it suitable for Transshipment operations. Vizhinjam Port, located near the capital city of Thiruvananthapuram, is an upcoming deep-sea port in Kerala. It is being developed as a Transshipment hub, with the capacity to handle large container vessels and transship cargo to and from other ports in the region. Vizhinjam Port is expected to be operational soon, and its development has been based on the PPP model.

The Transshipment market in Kerala is primarily driven by the increasing demand for containerized cargo and changing trade patterns. With the growth of manufacturing and trade in the region, there is a need for efficient and cost-effective Transshipment solutions to connect Kerala with global markets. Kerala has a significant hinterland catchment, including the states of Kerala, Tamil Nadu, Karnataka, and parts of neighboring countries such as Sri Lanka and Maldives. The demand for Transshipment services is expected to come from this hinterland, which includes major industrial and commercial centers. The Transshipment market in Kerala faces competition from other established Transshipment hubs in the region, such as Colombo in Sri Lanka and ports in the UAE, Singapore, and Malaysia. These hubs have well-developed infrastructure, established logistics networks, and competitive pricing, which pose challenges for the Transshipment market in Kerala.

The government of Kerala has been supportive of the development of Transshipment facilities in the state. The state government has provided incentives, including reduced tariffs and simplified procedures, to attract Transshipment business. The government has also taken initiatives to improve hinterland connectivity through road and rail networks, which is crucial for the success of the Transshipment market.

The Transshipment market in Kerala has significant growth potential, driven by increasing trade volumes, infrastructure development, and government support. The operationalization of Vizhinjam Port is expected to further boost Transshipment operations in the state. However, it also faces challenges in terms of competition from other Transshipment hubs, hinterland infrastructure, and pricing competitiveness.

## **Industry Profile**

### **What is a Port?**

A port is a designated area along the coast of an ocean, river, or lake where ships can dock to load and unload cargo and passengers. Ports are crucial for a country's economy and international trade as they serve as hubs for various modes of transportation such as trucks, barges, ships, and rail. Ports play a vital role in transporting commodities within a country and between countries, and they promote favorable trading conditions and economic development. Being accessible by both land and water, ports allow for efficient movement of goods and people.

Sea ports are equipped with facilities for berthing, anchoring, and transportation of commodities between vessels and shore. They provide safe docking and mooring for vessels, as well as storage facilities such as warehouses, transit sheds, and tanks for different types of cargo. Ports also offer connectivity options through road, rail, air, and inland waterways, making it convenient for visitors to access the port and conduct business.

### **Ports and economic development**

Ports are recognized as a critical component of industrial sector growth and overall economic development.

Other key sectors of infrastructure include

Power generation,

Coal production,

Petroleum production,

Cement production,

Railways,

Civil aviation,

Roads, and

Telecommunications.

These sectors collectively contribute to the growth and development of a country's economy.

## **Transshipment**

Transshipment refers to the process of transferring goods or cargo from one mode of transportation to another during the transportation journey. It typically occurs when goods are being transported from the origin to the final destination using multiple modes of transportation, such as from a ship to a truck, from a truck to a train, or from a train to an airplane. Transshipment is a common practice in logistics and transportation, and it is often used to optimize the transportation process by leveraging the strengths of different transportation modes. For example, goods may be transported by sea to a port, then transferred to a truck for transportation to a warehouse, and finally loaded onto a train for delivery to the final destination. Transshipment can help streamline the transportation process, reduce transportation costs, and improve efficiency by allowing goods to be transported using the most appropriate mode of transportation for each leg of the journey.

However, transshipment also introduces additional handling, documentation, and potential delays, as goods need to be unloaded from one mode of transportation and loaded onto another. Additionally, transshipment may be subject to customs and regulatory requirements, depending on the countries involved, which adds complexity to the transportation process. Proper planning, coordination, and documentation are essential to ensure smooth transshipment operations and timely delivery of goods.

Transshipment, or the transfer of goods or passengers from one mode of transportation to another during the course of a journey, has a long history dating back to ancient times. The practice of transshipment has evolved over time to meet the changing needs of transportation and trade. Historically, transshipment was commonly used in maritime transportation. In ancient civilizations such as Egypt, Mesopotamia, and the Indus Valley, river ports served as transshipment hubs where cargo was transferred from river boats to larger sea-going vessels for long-distance trade. This allowed goods to be transported across different bodies of water, facilitating international trade.

With the advent of railways in the 19th century, transshipment also became common in rail transportation. Goods would be loaded onto trains at one location, transported to a rail hub, and then transferred to another train for further transport to the final destination. This allowed for more efficient and widespread distribution of goods across large distances.

The rise of air transportation in the 20th century also led to the practice of transshipment in the aviation industry. Air cargo would be transferred from one plane to another at intermediate airports to reach destinations that were not directly served by long-haul flights. This enabled faster and more convenient global trade of goods and enhanced connectivity between different regions. In recent years, transshipment has also become common in the context of containerization. Container ships, which revolutionized the shipping industry by standardizing cargo transportation in intermodal containers, often require transshipment at major ports to transfer containers between different vessels or modes of transportation, such as from ships to trucks or trains, for onward transport. Transshipment has played a crucial role in enabling the efficient movement of goods and passengers across different transportation modes and facilitating global trade throughout history. It continues to be a key practice in modern transportation and logistics, supporting the growth and development of economies worldwide.

Currently, Indian gateway ports lack sufficient facilities and are situated far from international shipping routes, resulting in a low number of mainline vessels calling at these ports. As a result, around 61% of Indian export/import containers are transhipped through foreign ports such as Colombo, Singapore, and Salalah (Oman), resulting in an additional cost of up to \$200 per TEU of cargo. Indian exporters pay 11.4% of the CIF value of goods as freight, which is higher than the world average of 6.1%.

However, despite Vizhinjam's location in the deep south, cargo interests in the southern, northern, and western regions may find it more feasible to use the port as a gateway/transshipment terminal rather than relying on Colombo, Singapore, or Salalah. This means that the port's hinterland could extend to the western and northern parts of India. Once operational, the port will eliminate the need for Indian exports to

travel to Dubai or Singapore for transshipment of cargo, resulting in a savings of approximately Rs. 1000 crores in expenditure.

The proposed port site is well-connected to the national highway and rail network. The NH-47, which has been in use for years, connects Thiruvananthapuram to Salem via Coimbatore, and on the other side, to Kanyakumari, where it will link to the proposed N-S corridor under the National Highway Development Project (NHDP) of the National Highway Authority of India (NHAI). Additionally, NHAI is currently working on a new alignment connecting Thiruvananthapuram to Kanyakumari, with details to be announced soon. The NH-47 bypass is located only 3km away from the proposed port site, while the national rail network is less than 12km away.

## LITERATURE REVIEW

1. Gunawardena and Ariyawansa's paper evaluates the potential of the Port of Colombo to become a successful hub port in the region through a quantitative analysis of its performance compared to other major ports. The authors identify the strengths of the Port of Colombo, such as its strategic location and efficient terminal operations, and highlight the characteristics of a successful hub port. However, they also recognize the challenges the Port of Colombo must overcome, including competition from other ports, infrastructure and connectivity improvements, and a favourable business environment. The authors recommend focusing on developing transshipment capabilities, improving infrastructure and connectivity, and strengthening partnerships with shipping lines and stakeholders. The paper offers valuable insights and recommendations to enhance the competitiveness of the Port of Colombo in the region.
2. The paper by Liebuviene and Čižiūnienė compares the performance of ports on the Eastern Baltic Sea Coast through a quantitative analysis, focusing on measures such as container throughput, vessel turnaround time, and port productivity. The authors identify the key factors that contribute to the success of a port, including efficient terminal operations, reliable infrastructure, and strong partnerships, and highlight the challenges facing the shipping industry, such as changing demand patterns and environmental regulations. The study finds that the Port of Klaipėda has the highest container throughput, but all ports on the Eastern Baltic Sea Coast face challenges such as inadequate infrastructure and insufficient investment in port development. The authors recommend that the ports focus on improving their hinterland connections, enhancing their infrastructure and service offerings, and strengthening partnerships with stakeholders. The paper provides valuable insights for policymakers and port operators seeking to enhance the competitiveness of their ports.
3. Slack and Governal's paper explore the relationship between container transshipment and logistics and urban economic development. The literature

review highlights the importance of containerization in global trade, the rise of hub ports, and the significance of logistics in generating income and creating jobs. The paper identifies the challenges facing container transshipment and logistics, including congestion, inadequate infrastructure, and environmental concerns. The authors emphasize the need for a collaborative approach between stakeholders to address these challenges and promote urban economic development. The paper concludes with recommendations for policymakers and port operators, including investments in infrastructure and technology to improve efficiency and sustainability. Overall, the paper provides valuable insights into the role of container transshipment and logistics in urban economic development.

4. The paper is a Detailed Project Report prepared for the Vizhinjam International Seaport Limited, which aims to construct a deep-water seaport on India's west coast. The literature review examines the global shipping industry and provides an overview of port development and operations. The report discusses the factors that contribute to the success of ports, such as efficient terminal operations, reliable infrastructure, and strong partnerships, and highlights the challenges facing the industry, including changing demand patterns, environmental concerns, and competition from other ports. The paper also provides a detailed analysis of the proposed seaport's location, design, and capacity, along with financial projections and recommendations for the project's implementation. Overall, the paper offers valuable insights for policymakers and investors seeking to develop and operate a successful seaport.
5. Mallick's paper focuses on the potential of Vizhinjam Port to become a regional hub using a network analysis approach. The literature review discusses the role of hub ports in global trade and the factors that contribute to their success, such as location, connectivity, and infrastructure. The paper identifies the key players in the global shipping network and their connections to Vizhinjam Port. The analysis suggests that the port's location and connectivity give it significant potential to become a regional hub, particularly for container transshipment. The

paper also highlights the challenges facing Vizhinjam Port, such as competition from other ports, inadequate infrastructure, and environmental concerns. Overall, the paper provides valuable insights for policymakers and port operators seeking to enhance the competitiveness of Vizhinjam Port as a regional hub.

6. The paper by Kavirathna et al. examines the transshipment hub port selection criteria used by shipping lines in the Bay of Bengal region. The literature review highlights the importance of transshipment operations in the shipping industry and the role of hub ports in facilitating these operations. The paper identifies the key criteria used by shipping lines to select hub ports, such as location, connectivity, efficiency, and reliability, and compares the performance of selected hub ports in the region. The analysis suggests that the criteria used by shipping lines vary depending on their business objectives and operational requirements. The paper also discusses the challenges facing hub ports in the region, such as inadequate infrastructure and competition from other ports. Overall, the paper provides valuable insights for policymakers and port operators seeking to enhance the competitiveness of hub ports in the Bay of Bengal region.
7. Rajendran's paper focuses on the emergence of Vizhinjam International Seaport as a transshipment hub port in the Indian subcontinent. The literature review provides an overview of the global shipping industry and the factors that contribute to the success of hub ports, such as location, connectivity, and infrastructure. The paper examines the key players in the shipping network and their connections to Vizhinjam Port, highlighting the potential for the port to become a transshipment hub for South Asia, the Middle East, and East Africa. The analysis also identifies the challenges facing the port, such as competition from other ports and the need for significant investments in infrastructure and technology. Overall, the paper provides valuable insights for policymakers and investors seeking to develop and operate a successful transshipment hub port in the Indian subcontinent.

# INDUSTRY PROFILE

## VIZHINJAM PORT

### General

India has been struggling with a lack of transshipment hubs due to inadequate infrastructure and policy gaps. To address this issue, the government of Kerala is building a green-field deep-water port in Vizhinjam, Thiruvananthapuram district. The port is intended to be a deepwater multipurpose seaport primarily focused on container transshipment, as well as handling multi-purpose and break-bulk cargo. Despite facing delays, the completion of this port is expected to provide economic benefits and boost India's maritime position globally. The Vizhinjam port has significant geopolitical implications and could be a strategic breakthrough for India in terms of maritime-economic options. However, the emerging maritime narrative in the Indian peninsula presents an ambiguous outlook for the port.

The development of the port is currently being carried out in a landlord model with a Public Private Partnership (PPP) component, based on a design, build, finance, operate, and transfer (DBFOT) basis. The private partner, M/s Adani Vizhinjam Port Private Limited, has commenced construction on December 5th, 2015. To oversee the development of the greenfield port at Vizhinjam in Thiruvananthapuram district, Kerala, a separate company called Vizhinjam International Seaport Limited (VISL) has been formed as a special purpose government company fully owned by the Government of Kerala, which will act as the implementing agency for the project.



Phase	Year	Container Terminal (TEU)	Multipurpose terminal (tons)	Proposed Area (ha)
PHASE 1	2019	700,000	107,000	26
PHASE 2	2029	1,600,000	359,000	24
PHASE 3	2044	2,850,000	777,000	30

The Government of Kerala, through VISL, has appointed the International Finance Corporation (IFC) as its Transaction Advisor to assist in the structuring and implementation of the Vizhinjam Port project, which is initially proposed to be developed based on a Public Private Partnership (PPP) model. To assess the market potential of the project, IFC, with the help of Drewry Shipping's International, UK, conducted a market assessment and engaged Royal Haskoning as their technical consultant to prepare a preliminary project plan. According to Drewry's studies, due to a small immediate hinterland, the biggest potential for the Vizhinjam project was to attract container Transhipment traffic. However, the competition from ports like Colombo and Vallarpadam terminal in Cochin and other ports was intense, and it was projected that Vizhinjam would need to competitively price its container handling services to attract traffic away from competing ports.

The proposed project follows a Landlord Port Model, where VISL will develop the basic infrastructure, including the construction of breakwater, quay wall, dredging, reclamation, rail and road access to the port. Port operations will be carried out through the PPP model for an agreed concession time period. Terminal operators may be required to develop the container yard, terminal buildings, and purchase and operate cargo handling equipment, depending on the final project structuring plan adopted by VISL. The development of the port is envisioned to incorporate proven and cost-effective Green Port initiatives in all aspects of construction and operation.

The port will be developed in three phases. Once fully developed, Phase-1 of the port is expected to have a breakwater with a total length of 3,180 meters (including a 140-meter extension for a fish landing harbor), a container berth length of 800 meters capable of handling the largest 18,000 TEU container vessels currently in operation, a container yard behind the quay length with a depth of up to 500 meters, a port craft berth of 100 meters, a Coast Guard berth of 120 meters, a cruise cum multipurpose cargo berth of 300 meters, berthing and storage/operation facilities for the Indian Navy with a berth length of 500 meters, and a fish landing center with a total berth length of 500 meters. The port is primarily designed to cater to the container Transshipment business, while the fish landing berths and cruise berth are being developed as part of corporate social responsibility (CSR) activities to improve the fisheries and tourism sectors in the project vicinity. The Navy and Coast Guard berths are developed to meet the security requirements of the Ministry of Defence, Government of India, considering the strategic location of Vizhinjam Port in the Indian Peninsula for combined operations of the Army and Air Force stations located in Thiruvananthapuram, Kerala.

The proposed Vizhinjam port is located in the state of Kerala, India, at a distance of 16 kilometers south of the state capital, Thiruvananthapuram, and falls in close proximity to the international East-West shipping route. The location of the port is as shown in the figure.



Figure: Location of Vizhinjam Port

Source: Detailed Project Report May 2013 DEVELOPMENT OF VIZHINJAM PORT

## Meteorological data

Location:

The Vizhinjam Port project is strategically located at the tip of the southern peninsula on the west coast of India, approximately 10 nautical miles from the international shipping route and very close to the EAST-WEST Shipping AXIS, which makes it well-positioned to attract container Transshipment traffic to and from India. The port is also conveniently located near the southern railway, connecting to Mumbai in the north and southern parts of Tamil Nadu through Nagercoil and Tiruchirapalli. It is approximately 8 km from NH 47, which connects Kanyakumari in the south to Mumbai in the north. Additionally, the popular tourist center of Kovalam beach is located about 2 km north of Vizhinjam village. Vizhinjam already has a busy fishing harbor and is home to fishing communities and resorts to the south of the proposed port. The proposed port development is planned along a 2.5 km long waterfront in Vizhinjam,

near Thiruvananthapuram, Kerala. The coastline in the area of interest is hilly and steep, oriented towards the Northwest-Southeast direction (bearing of the shoreline is about  $155^{\circ}$  -  $304^{\circ}$ N).

#### Meteorological Data:

Vizhinjam Port is a coastal port, located along the coastline of the Arabian Sea. The port's location on the southwestern coast of India offers access to international shipping routes and enables trade with countries in the Middle East, Europe, Africa, and other regions. The Port has a deepwater location, endowed with a natural draft of 24 meters (when compared to other ports around the world, it is by far the best), as close as 1 Nm from the sea coast, which makes it suitable for handling larger vessels. This allows for handling of various types of cargo, including bulk cargo, containers, and liquid cargo. The port is located in a natural bay, which provides natural protection from rough seas and adverse weather conditions. Due to this natural depth, the fear of sedimentation can be avoided. So, in the site, there is no need of dredging or minimal capital dredging, which helps in lowering the cost (as compared to any other port in India within a reasonable distance from the East-West Shipping Axis). This makes it a relatively safe and sheltered port for vessel operations.

The coastline around Vizhinjam Port is characterized by rocky terrain and cliffs. The natural rock formation provides a solid foundation for the construction of port infrastructure, including breakwaters, jetties, and other port facilities.

#### Tropical Climate:

Vizhinjam Port experiences a tropical climate with hot and humid weather throughout the year. The monsoon season, which usually occurs from June to September, can bring heavy rainfall and rough seas, which can impact port operations.

#### Proximity to International Shipping Routes:

Vizhinjam Port is strategically located near major international shipping routes, including the East-West shipping route, which connects Europe with Asia. This makes it well-positioned for transshipment and international trade.

#### Coastal Ecosystem:

The coastal region around Vizhinjam Port is known for its rich biodiversity, including coral reefs, marine life, and mangrove forests. Environmental considerations and conservation measures need to be taken into account during port development and operations to minimize potential impacts on the coastal ecosystem.

### **Transport Linkages and External Infrastructure**

#### Road Link

The Thiruvananthapuram district is well connected to the rest of the country through road, rail, and air transport. The National Highway NH 47 passes through Thiruvananthapuram, running parallel to the shoreline at a distance of approximately 8 km. NH 47 connects Salem to Kanyakumari and also links to Cochin Port via NH 47A. Further north, it connects to Mumbai through NH 17. Thiruvananthapuram is a major urban center on NH 47, with Nagercoil and Kanyakumari being the nearest major urban centers in the south. NH 47 also provides connectivity to other major towns in Kerala, such as Thrissur, Palakkad, Kollam, and Alappuzha, as well as Coimbatore and Salem in Tamil Nadu. Additionally, NH 47 is connected to Chennai and the rest of the country through NH 7 and NH 4. There is also ongoing construction work to extend the NH 47 bypass road from Thiruvananthapuram to Kovalam, with plans to further extend it up to Parassala.

#### Rail Link

The only railway connection to Vizhinjam Port is the Southern Railway Main Line, which is located approximately 8 km from the port boundary. This existing railway line runs in a North-South direction parallel to NH 47, passing through major towns in Kerala such as Thrissur, Palakkad, Kollam, Ernakulam, and Alappuzha. It also

connects to Mumbai through the Konkan Railway. Additionally, this rail line provides connectivity to the southern part of Tamil Nadu through Nagercoil and Tiruchirapalli, as well as to the North-West region of Tamil Nadu through Palakkad and Coimbatore.

The main line of the broad gauge passes through Nemom, Neyyatinkara, and Balaramapuram railway stations. The broad-gauge single rail line runs between Thiruvananthapuram and Kanyakumari, and beyond Thiruvananthapuram towards the north, up to Kayamkulam, a double rail line exists. Balaramapuram (Flag Station) and Neyyatinkara (Block Station) are located on the southern side of the proposed rail alignment, while Nemom (Block Station) is on the northern side. These three stations are approximately 9 km, 13 km, and 10 km away from the port boundary, respectively.

#### Hinterland

The hinterland catchment area of Vizhinjam Port refers to the geographic region surrounding the port from which it draws cargo for import and export. It is the area that is connected to the port through efficient transportation links such as road, rail, and inland waterways, and from which cargo is transported to and from the port.

The hinterland catchment of Vizhinjam Port primarily includes the southern region of Kerala, especially the districts of Thiruvananthapuram, Kollam, and parts of Pathanamthitta, Alappuzha, and Kottayam. The catchment area also extends to the neighboring states of Tamil Nadu and Karnataka, as Vizhinjam Port is strategically located close to the southern tip of India and is well-connected to these states through road and rail networks.

The exact extent of the hinterland catchment of Vizhinjam Port may vary depending on various factors such as transportation infrastructure, logistics networks, economic activities, and trade patterns. As the port becomes fully operational, it is expected to serve as a gateway for trade in the region, catering to industries, businesses, and exporters/importers within its catchment area and beyond.

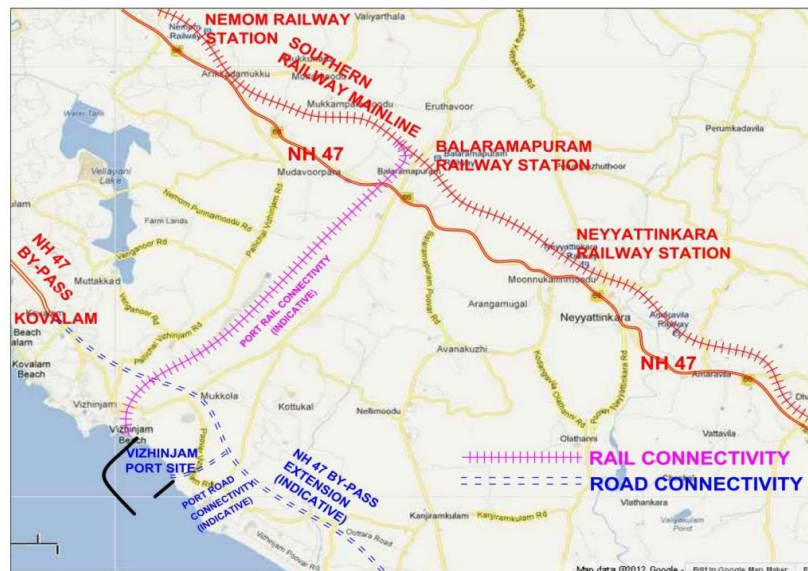


Figure: Rail and Road Connectivity to Vizhinjam Port

Source: Detailed Project Report May 2013 DEVELOPMENT OF VIZHINJAM PORT

The proposed port is a Green-field project that will be built outside of urban areas, allowing the experienced developer to plan and design it according to their needs. With the developer's international experience in building ports, this new port has the potential to become a highly productive and efficient one, attracting a significant portion of container transshipment traffic currently going to other ports such as Colombo, Singapore, and Dubai. Its establishment can also lead to the economic development of India, creating numerous job opportunities.

According to a Container Shipment Economics Study, the new port is expected to reduce the total cost of container transportation to and from foreign destinations. Currently, India's port capacity (12 major ports) is only 4.61 million TEUs per year, which is significantly less than China's capacity of 50 million TEUs. However, a study conducted by IL&FS Infrastructure Development Corporation and Hauer Associates found that the Sethusamudram project would improve the movement of Indian cargo along the coast, increasing the potential of Vizhinjam as a transshipment hub.

The Indian Ocean's important position in global maritime trade, accounting for over 50% of seaborne trade, provides India with a significant opportunity to establish itself as a regional power. While India's military strength at sea has been well known for

some time, its civilian maritime infrastructure has been largely overlooked due to a lack of focus on the domestic port sector. Currently, only a handful of container transshipment ports in India have the necessary capacity to handle large ships, with west coast ports dominating the domestic container market. As a result, a significant amount of cargo traffic is diverted to foreign container transshipment ports, such as Colombo, Jebel Ali, Klang, Salalah, and Singapore, for "bulk break" and further transport. Colombo port, in particular, is the leading transshipment hub for containerized freight.

The Vizhinjam port project is seen as a strategic opportunity for India. The port, with a transshipment hub, will be able to handle the largest mainline vessels and has 2000 meters of berthing space for containers with a draught of 18.4 meters. This will reduce India's dependence on foreign ports for cargo transshipment, save costs, and provide a significant geostrategic advantage due to its proximity to the Bay of Bengal, the Coast of East Africa, the Middle East, and the Strait of Malacca. Another significant advantage of the port is the relaxation of cabotage laws, which would allow foreign-flagged vessels to transport cargo along coastal routes.

Experts believe that Vizhinjam port will compete with several ports within India and abroad, including Chennai, Tuticorin, and the Vallarpadam International Container Transshipment Terminal in Kochi, Kerala. It will also provide strong competition to the proposed Enayam port project in Tamil Nadu, which is only 36 km south of Vizhinjam. The Colombo port, which is highly dependent on India for its container cargo business, is likely to face significant competition from Vizhinjam port, potentially resulting in an economic setback for Sri Lanka. The operationalisation of Vizhinjam port would shift India's maritime port sector towards an independent cargo handling mechanism, reducing its reliance on foreign ports and further consolidating India's position as a regional power.

### **Vizhinjam Port as a Game changer**

The Vizhinjam port project in India has the potential to be a game-changer, but there are several factors that cast doubt on its success. The hinterland of the port lacks

industrial development, which means that it is likely to be more suited to transshipment traffic than gateway traffic. India's higher port handling charges and port call costs for cargo vessels are further reasons for the country's bewildered state of transshipment, making Colombo a more attractive choice for shipping liners. While Vizhinjam can contribute to the Sagarmala initiative and improve India's maritime connectivity, the country's policy-inertia and political ecology, including labour strikes and local opposition, pose challenges. Enayam port, a proposed project similar to Vizhinjam in profile and geography, may also affect the former's success. Nevertheless, the presence of multiple ports in the southern Indian peninsula provides sufficient room for developing a "cluster" of transshipment hubs, which complements the country's maritime sway in the region. Repositioning Vizhinjam with the so-called geopolitical buzzword "Indo-Pacific" could reap a range of benefits in the maritime arena.

## **ICTT, Cochin Port**

### **General**

Cochin Port, also known as the International Container Transshipment Terminal (ICTT), is a major seaport located in the city of Kochi, in the state of Kerala, India. It is one of the largest ports in India and is strategically positioned on the west coast of India, serving as a key hub for international container Transshipment traffic in the region. The ICTT is located near the Vallarpadam Island, which is connected to the mainland by road and rail bridges, making it easily accessible for cargo transport.

The ICTT at Cochin Port is a state-of-the-art facility that offers modern infrastructure and facilities for handling containerized cargo. It is equipped with advanced container handling equipment, including cranes, conveyor systems, and storage yards, to ensure efficient handling and movement of containers. The terminal is capable of handling large container vessels and has deep draft berths that can accommodate mega-container ships.

The Cochin Port ICTT has played a significant role in enhancing the connectivity and trade in the region by providing a convenient gateway for Transshipment of containers to and from major ports in India and other countries. It has also contributed to the economic development of the region by generating employment opportunities and facilitating trade and commerce. The ICTT has been recognized for its operational efficiency, environmental sustainability, and use of modern technology in port operations.



The Kochi International Container Transshipment Terminal, locally known as the Vallarpadam Terminal. Source: The Dollar Business Magazine, COCHIN PORT – SHIPPING IN TROUBLED WATERS.

## **Location**

The International Container Transshipment Terminal (ICTT) is located in Vallarpadam Island, which is part of the city of Kochi (Cochin) in the state of Kerala, India. Vallarpadam Island is situated in the Vembanad Lake, near the mainland, and is connected to the mainland by road and rail bridges. It is approximately 10 kilometers (6.2 miles) north-west of the main Kochi city center and about 35 kilometers (21.7 miles) south-west of the Cochin Port Trust's main container terminal, the Ernakulam Wharf. The ICTT is strategically positioned on the west coast of India, making it well-connected to major international shipping routes and serving as a key Transshipment hub in the region.

Cochin, an all-weather natural Harbour is located strategically close to the busiest international sea routes:

- (1) Gulf to Singapore and Far East (11 Nautical Miles from Cochin Port)
- (2) Suez to Singapore / Far East (74 Nautical Miles from Cochin Port)



Layout out of Vallarpadam Container Terminal, ICTT, Kochi

Source: Cochinsquare Vallarpadam Container Terminal Traffic Signal an absolute necessity

## Geographic conditions

Kochi is located along the major international shipping routes, including the main east-west shipping route connecting Europe, Middle East, and Asia. This makes it an ideal location for a transshipment terminal, as it offers convenient access to global trade routes. Vallarpadam Terminal has a deepwater harbor, allowing large container vessels to dock and operate efficiently. The terminal has a draft of up to 14.5 meters, which enables it to handle larger vessels and accommodate deeper drafts.

The location of ICTT, Kochi offers a natural sheltered harbor, protected from the open sea by several islands, including Vallarpadam Island. This provides a natural buffer against adverse weather conditions, making it a safe and secure location for transshipment operations.

Access to Backwaters and Inland Waterways:

The terminal is connected to the extensive network of backwaters and inland waterways in Kerala, which provides additional modes of transportation for cargo movement. This enables efficient connectivity with the hinterland regions of Kerala, Tamil Nadu, and Karnataka, and facilitates seamless transportation of cargo to and from the terminal.

Kochi, where ICTT is located, has a close proximity to major industrial and commercial centers in the hinterland, including the states of Kerala, Tamil Nadu, and Karnataka. This makes it a convenient transshipment hub for cargo destined to or originating from these regions.

### **Connectivity**

The Cochin port is well connected to its hinterland, including the states of Kerala, South Tamil Nadu, and South Karnataka, through National Highways such as NH 47 (Kanyakumari-Salem), NH 49 (Cochin-Madurai), and NH 17 (Cochin-Mumbai). Additionally, the Indian Railway Network provides seamless connectivity to South and Central India, while the National Waterway NW3 offers connectivity to South Kerala. The port is also in close proximity to an international airport, further enhancing its accessibility.

In addition to road, rail, and waterway connectivity, there are Inland Container Depots (ICDs) at Coimbatore and Bangalore, which are connected by regular train services. This network of railways, roads, waterways, and airways has created a robust accessibility framework for the port, facilitating efficient transportation of goods to and from the hinterland.

### **Development path**

Cochin Port is in the process of implementing an ERP (Enterprise Resource Planning) system to improve its operational efficiency. The port is also undertaking modernization and expansion of the Mattancherry Wharf to increase its capacity. Upgrades to the power infrastructure are also being carried out to enhance the port's

operational capabilities. Furthermore, the port is equipping its new multi-purpose berths with state-of-the-art Bulk/Break Bulk handling Cranes to improve cargo handling efficiency. Additionally, Cochin Port is actively involved in the development of India's first Port Based Special Economic Zone, aiming to promote economic growth and trade in the region.



## COLOMBO PORT

### General

The Port of Colombo is a prominent hub for container and passenger traffic in the Indian Ocean, boasting 51 berths and 3 container terminals. It serves as the headquarters for Sri Lanka's banks and insurance companies, and is a key connection point for commercial centers in South Asia.

Historically, the Port of Colombo was administered by the Colombo Port Commission, a government department responsible for cargo-handling equipment, infrastructure, pilotage services, and docking activities. Stevedoring and shore handling were handled by private wharfage companies. In 1958, the Port Cargo Corporation was established to consolidate these operations, and in 1967, the Port Tally and Protective Services Corporation was formed to provide on-board tallying and watchmen services on behalf of agents.

Today, the Port of Colombo is a rapidly growing maritime hub in South Asia, serving as a convenient and efficient gateway for cargo destined to and originating from Europe, East and South Asia, the Persian Gulf, and East Africa. Containerized cargo handling is a primary focus, with the port handling around 5.1 million TEUs in 2015.

The original port had a harbor area of 184 hectares, and in 2008, the South Harbor area was developed to accommodate deep-water berths for the latest generation of mainline vessels, covering 285 hectares. The harbor features a two-way channel with a depth of 20m and a width of 570m.

In addition to the container terminals in the original port area, the Sri Lanka Ports Authority (SLPA) has plans to develop three additional terminals in the South Harbor, each with a capacity of 2.4 million TEUs. The first of these terminals has already been built and is in operation under a build-operate-transfer (BOT) arrangement by Colombo International Container Terminals Limited (CICT), a joint venture between China Merchants Holding (International) Co. Ltd and SLPA.



Colombo International Container Terminal

Source: Sri Lanka Port authority, Sri Lanka the maritime hub – Colombo International Container terminal

## **Location**

The Port of Colombo, also known as the Port of Kolomtota during the early 14th Century Kotte Kingdom, is the largest and most active port in Sri Lanka and the Indian Ocean. Situated in Colombo, on the southwestern banks of the Kelani River, it holds strategic significance in Asia due to its prime location in the Indian Ocean.

**Latitude** 6.9514° N

**Longitude** 79.8478° E



Layout of Colombo Port

Source: [thiruvananthapuramupdates.wordpress.com](http://thiruvananthapuramupdates.wordpress.com) - How will the Vizhinjam port affect Colombo?

## Geographical data

The Colombo Port has a deepwater harbor, with a natural depth of up to 15 meters, allowing large container vessels to dock and operate efficiently. This enables the port to handle larger vessels and accommodate deeper drafts, facilitating the transshipment of cargo between different vessels. Colombo Port is a natural harbor protected by Colombo Bay, which provides a natural sheltered area, protecting the port from the open sea and adverse weather conditions. This makes it a safe and secure location for transshipment operations, with minimal disruptions due to weather-related issues.

Colombo Port is strategically positioned along the major international shipping routes, offering convenient access to global trade routes. It serves as a key transshipment hub for cargo moving between Asia, Europe, Africa, and the Middle East, due to its location on major shipping lanes. Colombo Port is well-connected to the hinterland of Sri

Lanka, which includes major industrial and commercial centers. The port is connected to the road and rail networks, providing efficient connectivity to the major cities and industrial hubs in Sri Lanka, facilitating the movement of cargo to and from the port.

Colombo Port is equipped with modern infrastructure, including container terminals with advanced handling equipment, state-of-the-art container handling facilities, and efficient logistics services. This enables smooth and efficient handling of cargo, contributing to the port's transshipment capabilities.



## DATA ANALYSIS

### Advantages Of Vizhinjam Port

Vizhinjam Port, located in Thiruvananthapuram, Kerala, India, is a deep-water Transshipment port project that offers several advantages:

**Strategic Location:** Vizhinjam Port is strategically located on the southern tip of India, which makes it an ideal Transshipment hub for both the east-west and north-south trade routes. It is located close to the major international shipping routes, just 1 Nm off the Vizhinjam coast, which reduces deviation time and saves fuel costs for vessels. It has a close geographic proximity to Bay of Bengal, the Middle east, Coast of East Africa and strait of Malacca.

**Deep-water Port:** Vizhinjam Port has a natural deep-water draft of up to 24 meters, which allows it to handle large container ships, bulk carriers, and other vessels. This makes it one of the deepest ports in India, capable of accommodating mega container vessels even a capacity up to 18000 TEUs that require deep-draft facilities.

**Transshipment Hub:** Vizhinjam Port is designed to be a Transshipment hub, where cargo from various ports in the region can be consolidated and transferred to larger vessels for onward shipment to international destinations. This helps to reduce the congestion at other ports and enables efficient handling and transfer of cargo.

**Modern Infrastructure:** Vizhinjam Port is being developed as a modern port with state-of-the-art infrastructure and facilities, including deep berths, container handling equipment, storage yards, and road and rail connectivity. The port facilitates a berthing space of 2000 meters and a container draught of 18.4. The port is being developed as a Free Trade Warehousing Zone (FTWZ), which allows for efficient storage and movement of goods.

**Economic Benefits:** The development of Vizhinjam Port is expected to have significant economic benefits for the region and the country. It is expected to generate employment opportunities, boost trade and commerce, attract investments, and

contribute to the economic growth of the region and the country. Another striking benefit is that it offers a relaxation to the Cabotage law.

**Environmentally Friendly:** Vizhinjam Port is designed with environmental considerations in mind. The port project includes measures to protect the marine environment, such as dredging and reclamation activities, which are being carried out with proper environmental clearances and guidelines. The port also has plans for a comprehensive environmental monitoring and management system.

**Connectivity:** Vizhinjam Port is well-connected with a network of road and rail connectivity, which facilitates efficient movement of cargo to and from the port. The port is also planned to have direct connectivity to the nearby international airport, which will further enhance its accessibility.

**Diversification of Trade Routes:** Vizhinjam Port offers an alternative trade route for shippers, providing diversification from existing ports in the region. This can help reduce dependence on a single port or route, ensuring smooth trade operations even during disruptions or congestion at other ports.

### **Disadvantages Of Vizhinjam Port**

While Vizhinjam Port offers many advantages, there are also some potential disadvantages that need to be considered:

**Environmental Impact:** The development of a deep-water port like Vizhinjam Port involves dredging, reclamation, and other construction activities, which can have potential environmental impacts such as disruption of marine habitats, sedimentation, and water quality issues. Proper environmental management and mitigation measures need to be in place to minimize the negative impact on the environment.

**Social Impact:** The development of Vizhinjam Port may have social impacts on local communities, including potential displacement of people, loss of livelihoods, and changes in local socio-economic dynamics. Adequate measures should be taken to

address these social impacts and ensure proper rehabilitation and resettlement of affected communities.

**Competition with Existing Ports:** Vizhinjam Port may face competition with existing ports in the region, as well as with other Transshipment hubs globally. Established ports with existing infrastructure and facilities may pose challenges in terms of attracting sufficient cargo volumes to sustain operations and achieve profitability.

**Operational Challenges:** As a newly developed port, Vizhinjam Port may face operational challenges, including attracting sufficient shipping lines, establishing efficient logistics chains, managing port operations, and handling the Transshipment of cargo. Adequate planning, coordination, and operational expertise will be required to ensure smooth operations.

**Financing and Investment Risks:** The development of a deep-water port like Vizhinjam Port requires significant investments in infrastructure, equipment, and operations. There may be risks associated with financing, attracting investments, and achieving a return on investment within the expected timelines, which can impact the financial viability of the port.

**Regulatory and Policy Challenges:** The development of Vizhinjam Port may face regulatory and policy challenges, including obtaining necessary approvals, complying with local and international regulations, dealing with bureaucratic processes, and addressing legal and policy uncertainties, which can impact the project timeline and viability.

**Geopolitical Considerations:** The geopolitical situation in the region, including changes in trade policies, disputes, or conflicts, may have an impact on the operations and business environment of Vizhinjam Port. Geopolitical risks need to be carefully considered and managed to ensure smooth operations and business continuity.

## Advantages Of Colombo Port

Colombo Port, located in the capital city of Sri Lanka, is a major deep-water port in the Indian Ocean region and offers several advantages, including:

**Strategic Location:** Colombo Port is strategically located along major international shipping routes, making it a natural Transshipment hub in the Indian Ocean. It is situated at the crossroads of East-West shipping routes and serves as a gateway to the Indian subcontinent, South Asia, and the Middle East. This favorable location provides efficient connectivity to various global trade routes, making it an attractive option for international shipping.

**Deep Draft:** Colombo Port has a maximum draft of around 15 meters, allowing it to accommodate large container ships and bulk carriers. This deep draft enables the port to handle bigger vessels and larger cargo volumes, making it suitable for handling different types of cargoes, including containers, vehicles, and bulk commodities.

**Well-Developed Infrastructure:** Colombo Port has well-developed infrastructure, including modern container terminals, efficient cargo handling facilities, and state-of-the-art logistics and supply chain operations. The port has multiple terminals with advanced container handling equipment, including gantry cranes and modern IT systems for cargo tracking and documentation, which contribute to efficient and smooth port operations.

**Established Transshipment Hub:** Colombo Port has a long history as a major Transshipment hub in the region, with established shipping lines, well-established trade relationships, and a large volume of Transshipment business. It has a wide network of shipping connections with major ports around the world, making it a preferred choice for Transshipment of cargo to and from various destinations in the region and beyond.

**Good Connectivity:** Colombo Port is well-connected with road and rail networks, allowing for efficient movement of cargo to and from the port. The port is also located

in close proximity to the Colombo International Airport, providing air connectivity for cargo movements, which enhances its multimodal transportation capabilities.

**Economic Contribution:** Colombo Port is a significant contributor to the economy of Sri Lanka, generating employment opportunities, attracting foreign investments, and generating revenue through port charges, fees, and related services. The port plays a vital role in the country's trade and commerce, supporting various industries and businesses.

**Trade Agreements:** Sri Lanka has signed several bilateral and multilateral trade agreements, including Free Trade Agreements (FTAs) and Preferential Trade Agreements (PTAs), with various countries and regions. These agreements provide favorable trade conditions for businesses using Colombo Port, facilitating trade and promoting economic growth.

### **Disadvantages Of Colombo Port**

While Colombo Port has several advantages, there are also some potential disadvantages, including:

**Congestion:** Colombo Port has experienced congestion issues in the past due to the high volume of cargo handled, leading to delays in vessel arrivals, berthing, and cargo handling. This can result in increased waiting times, longer transit times for cargo, and added costs for shipping lines and cargo owners.

**Limited Capacity:** Although Colombo Port has been expanding its capacity in recent years, it may still face limitations in handling increasing volumes of cargo in the future. As global trade grows and demand for port services increases, the port may face challenges in meeting the rising demand for container handling, storage, and Transshipment operations.

**High Costs:** Colombo Port has faced criticism for its relatively high port charges and fees compared to some other ports in the region. These costs can impact the overall

competitiveness of the port and may affect the decision-making of shipping lines and cargo owners when choosing a Transshipment hub or gateway port for their cargo.

**Competition from Regional Ports:** Colombo Port faces competition from other ports in the region, including ports in India, Malaysia, Singapore, and the Middle East. These ports may offer competitive advantages in terms of lower costs, better infrastructure, or more efficient operations, which could potentially divert some of the business away from Colombo Port.

**Geopolitical Risks:** Sri Lanka, where Colombo Port is located, has experienced geopolitical challenges and uncertainties in the past, which could impact the stability and operations of the port. Factors such as political instability, changes in government policies, or regional conflicts could potentially affect the smooth functioning of the port and create uncertainties for shipping lines and cargo owners.

**Environmental Concerns:** The expansion and operation of Colombo Port may have environmental impacts, including air pollution, water pollution, and potential harm to marine ecosystems. The port authorities need to address and mitigate these environmental concerns to ensure sustainable operations and minimize negative impacts on the environment.

**Infrastructure and Operational Challenges:** Despite its well-developed infrastructure, Colombo Port may face operational challenges such as labor strikes, equipment breakdowns, and other unforeseen events that could disrupt port operations and impact cargo handling efficiency.

### **Advantages Of ICTT, Kochi**

ICTT (International Container Transshipment Terminal), also known as Vallarpadam Terminal, is a modern Transshipment terminal located in Kochi, Kerala, India. It offers several advantages, including:

**Strategic Location:** ICTT is strategically located along the major international shipping routes in the Indian Ocean, making it a convenient Transshipment hub for

cargo moving between Europe, Middle East, South Asia, and Far East. Its location on the west coast of India provides a shorter route for vessels compared to other ports in the region, reducing transit times and fuel costs. Almost as same as that of the Vizhinjam Port.

**Deep Draft and Modern Infrastructure:** ICTT has a deep draft of 14.5 meters, allowing it to accommodate large container ships and bulk carriers. The terminal is equipped with modern container handling infrastructure, including state-of-the-art container handling equipment, automated systems, and advanced IT solutions for efficient cargo handling, tracking, and documentation. It has a quay length of 600 meters and a capacity of 1 million TEUs.

**Efficient Operations and Productivity:** ICTT has been designed as a highly automated terminal, with efficient operational processes, streamlined workflows, and advanced technology solutions. This results in faster vessel turnaround times, quicker cargo handling, and higher productivity levels, making it a preferred choice for Transshipment operations. The Terminal is equipped with 15 RTGCs and 4 Super-Post Panamax cranes with a throughput of 7.36 lakhs TEUs in 2020-21.

**Excellent Connectivity:** ICTT is well-connected with road, rail, and air networks, enabling efficient transportation of cargo to and from the terminal. It has good road connectivity to the national highways and major industrial clusters in Southern India, and a dedicated rail link connecting the terminal to the national railway network, providing seamless connectivity for cargo movement.

**Eco-friendly Operations:** ICTT has been designed with a focus on sustainability and environmental conservation. The terminal follows green practices, including use of eco-friendly technologies, energy-efficient lighting, rainwater harvesting, and waste management measures, making it an environmentally responsible choice for Transshipment operations.

**Special Economic Zone (SEZ) Status:** ICTT is part of the Vallarpadam SEZ, which offers various tax incentives, customs benefits, and simplified procedures for

businesses operating within the zone. This SEZ status provides additional advantages for businesses using the terminal, including reduced costs, streamlined processes, and improved competitiveness.

**Government Support:** ICTT has received strong support from the Government of India and the Government of Kerala, which have made significant investments in the terminal's development and infrastructure. This support includes policy reforms, regulatory frameworks, and incentives to promote Transshipment operations and boost trade and economic growth in the region.

### **Disadvantages Of ICTT, Kochi**

While ICTT (International Container Transshipment Terminal) in Kochi, India has several advantages, there are also potential disadvantages, including:

**Limited Hinterland:** The hinterland, or the catchment area, of ICTT may be relatively limited compared to other major Transshipment hubs. The terminal primarily serves the Indian subcontinent and neighbouring regions, which may have limitations in terms of cargo volumes and diversity of destinations compared to other global Transshipment hubs.

**Competition from Other Ports:** ICTT faces competition from other Transshipment hubs in the region, such as Colombo in Sri Lanka and ports in the Middle East, which may offer similar or better advantages in terms of location, infrastructure, and operational efficiency. This competition could potentially impact the volume of cargo handled at ICTT and its ability to attract shipping lines and cargo owners.

**Port Congestion and Capacity Limitations:** As Transshipment volumes increase, ICTT may face congestion and capacity limitations, resulting in longer waiting times for vessel berthing, slower cargo handling, and potential delays in transit times. This could impact the efficiency and productivity of the terminal and add costs for shipping lines and cargo owners.

**Infrastructural Challenges:** Despite its modern infrastructure, ICTT may face challenges in terms of maintenance, upgrades, and expansion to meet future demand. Ensuring uninterrupted operations, maintaining equipment reliability, and keeping up with technological advancements can be potential challenges that need to be managed effectively.

**Operational and Logistical Challenges:** ICTT may face operational challenges such as labor strikes, equipment breakdowns, and other unforeseen events that could disrupt port operations and impact cargo handling efficiency. Additionally, logistical challenges related to customs clearance, documentation, and inland transportation can also impact the overall efficiency of cargo movement through the terminal.

**Environmental and Social Concerns:** The operation of a large-scale port like ICTT can have environmental and social impacts, such as air and water pollution, habitat destruction, and social disruptions. Proper environmental management, community engagement, and social responsibility measures need to be in place to mitigate these concerns and ensure sustainable operations.

**Regulatory and Policy Changes:** Changes in regulations, policies, and trade agreements could impact the operations and competitiveness of ICTT. Shifts in government policies related to tariffs, taxes, customs regulations, and trade agreements could impact the attractiveness of ICTT as a Transshipment hub, and businesses operating at the terminal may need to adapt to such changes.

### **Vizhinjam Port Vs Colombo Port**

Vizhinjam Port in India and Colombo Port in Sri Lanka are both deep-water ports in the Indian Ocean region, but they have some key differences:

**Location:** Vizhinjam Port is located in Thiruvananthapuram, Kerala, India, on the southern tip of the Indian subcontinent, while Colombo Port is located in Colombo, the capital city of Sri Lanka. Colombo Port is strategically positioned along major international shipping routes, making it a natural Transshipment hub in the Indian

Ocean, whereas Vizhinjam Port is positioned to serve as a Transshipment hub for the south-west coast of India.

**Depth:** Vizhinjam Port has a natural deep draft of up to 20 meters, which allows it to handle large container ships and bulk carriers. Colombo Port, on the other hand, has a maximum draft of around 15 meters, which limits the size of vessels that can be accommodated. This gives Vizhinjam Port an advantage in handling larger vessels and deeper-draft cargoes.

**Transshipment Hub:** Both Vizhinjam Port and Colombo Port are developed as Transshipment hubs, where cargo from various ports in the region can be consolidated and transferred to larger vessels for onward shipment to international destinations. However, Colombo Port has an established history as a major Transshipment hub in the region, with well-developed infrastructure, established shipping lines, and a larger volume of Transshipment business compared to Vizhinjam Port, which is a relatively newer port.

**Infrastructure:** Colombo Port has well-established infrastructure with multiple terminals, modern container handling facilities, and efficient logistics chains. It has been operational for many years and has a well-developed ecosystem of services supporting port operations. Vizhinjam Port, on the other hand, is a newer port that is still under development and is in the process of building its infrastructure and facilities.

**Connectivity:** Both Vizhinjam Port and Colombo Port have good connectivity with road and rail networks, which facilitate the movement of cargo to and from the ports. Colombo Port also has an advantage of being located close to the Colombo International Airport, which provides air connectivity for cargo movements.

**Economic and Trade Factors:** Colombo Port has been a major Transshipment hub in the Indian Ocean for several years and has established trade relationships with various countries and regions. It has a large volume of Transshipment business, which contributes significantly to the economy of Sri Lanka. Vizhinjam Port, being a newer

port, is still in the process of establishing its presence in the region and attracting business.

**Geopolitical Considerations:** Both Vizhinjam Port and Colombo Port are located in the Indian Ocean region, which has geopolitical implications. The geopolitical situation in the region, including changes in trade policies, disputes, or conflicts, may impact the operations and business environment of both ports. However, Colombo Port has been an established Transshipment hub for many years and has experienced geopolitical challenges and changes, whereas Vizhinjam Port is a newer port that may face different challenges in the future.

### **Vizhinjam Port VS International Container Transshipment Terminal, Kochi**

ICTT (International Container Transshipment Terminal) in Kochi and the Vizhinjam Terminal are both ports located in the Indian state of Kerala, but they have some differences in terms of their features and advantages. Here is a comparison between the two:

**Location:** ICTT is located at Vallarpadam, an island in Kochi, while the Vizhinjam Terminal is located in Vizhinjam, near Thiruvananthapuram. ICTT is closer to the city of Kochi, which is a major commercial and industrial hub in Kerala, while Vizhinjam Terminal is closer to Thiruvananthapuram, the capital city of Kerala.

**Operational Focus:** ICTT is primarily a Transshipment terminal, focusing on handling Transshipment cargo, which is cargo that is transferred from one vessel to another for onward transportation to its final destination. On the other hand, Vizhinjam Terminal is designed to handle both Transshipment cargo as well as import and export cargo for the region.

**Infrastructure:** ICTT is a modern and state-of-the-art terminal with advanced container handling equipment, berths with deep draft, and efficient cargo handling systems. Vizhinjam Terminal is currently under development, and its infrastructure is

expected to be upgraded as per the requirements of the terminal operator and the needs of the shipping industry.

**Connectivity:** Both terminals are well connected through road and rail networks to the hinterland and major cities in Kerala and neighboring states. However, ICTT has a slight advantage in terms of its proximity to Kochi, which is a major transportation hub in the region and has better connectivity with the rest of India.

**Depth of Draft:** ICTT has a deeper draft, allowing larger vessels to call at the terminal, which can handle vessels up to 14 meters of draft. Vizhinjam Terminal is planned to have a draft of up to 20 meters, which would enable it to handle larger vessels.

**Capacity:** ICTT has a current handling capacity of around 600,000 TEUs (Twenty-foot Equivalent Units) annually, with potential for expansion. Vizhinjam Terminal, once fully developed, is expected to have a handling capacity of around 1.5 million TEUs annually, making it a larger terminal in terms of capacity.

**Operational Status:** ICTT is currently operational and has been handling Transshipment cargo since its inauguration in 2011. Vizhinjam Terminal, on the other hand, is still under construction and is expected to be completed and operational in the near future.

### Comparison between ICTT, Kochi, Colombo Port And Vizhinjam Port

Criteria/ Ports	Vizhinjam Port	ICTT Kochi	Colombo Transshipment Terminal
<b>Location</b>	Vizhinjam, Thiruvananthapuram, Kerala, India	Vallarpadam, Ernakulam, Kerala, India.	Colombo, Sri Lanka
<b>Depth / Draft available</b>	24 meters	14.5 meters	18 meters

COMPARATIVE ANALYSIS OF VIZHINJAM PORT VS OTHER NEIGHBOURING PORTS

<b>Type of Port</b>	Multipurpose port handling containers, bulk cargo and liquid cargo	Handles transshipment of containers	Multipurpose port handling containers, bulk cargo, liquid cargo.
<b>Ownership and Management</b>	Developed and operated by the Vizhinjam International Seaport Limited (VISL), a government-owned entity in Kerala, India.	Developed and operated by DP World, a global port operator.	Operated by the Sri Lanka Ports Authority (SLPA), a government-owned entity in Sri Lanka.
<b>Hinterland Catchment</b>	Expected to serve the hinterland of South India, including the states of Kerala, Karnataka, Tamil Nadu, and other neighboring regions.	Primarily serves the hinterland of South India, including the states of Kerala, Karnataka, and Tamil Nadu	Serves as a Transshipment hub, handling containers from various origins and destinations, including the Indian subcontinent, Southeast Asia, and East Africa.
<b>Number of berths</b>	3 berths for container handling	1 berth for container handling as of now	40 berths dedicated to container handling
<b>Connectivity</b>	Well-connected by road and rail, with an upcoming dedicated railway line connecting the port to the national rail network, and	Well-connected by road, rail, and air, with good connectivity to major cities in India	Well-connected by road, rail, and air, with good connectivity to major cities in Sri

COMPARATIVE ANALYSIS OF VIZHINJAM PORT VS OTHER NEIGHBOURING PORTS

	proximity to the Trivandrum International Airport		Lanka and international airports.
<b>Advantages</b>	Deepwater location, proximity to major international shipping routes, potential to become a major Transshipment hub in South India	Strategic location, modern infrastructure, good connectivity to major cities in South India	Established Transshipment hub, well-connected to major shipping routes, strategic location in the Indian Ocean.
<b>Disadvantages</b>	Ongoing port development, potential environmental impacts, competition from other established ports in the region.	Limited hinterland catchment area, competition from other nearby ports.	Congestion and capacity constraints, competition from other regional ports, potential geopolitical risks

## CONCLUSION

From the data analysis, it can be seen that Vizhinjam Port has several advantages, including its strategic location, deep-water facilities, Transshipment hub capabilities, modern infrastructure, economic benefits, environmental considerations, connectivity, and diversification of trade routes, which make it an attractive investment and trade destination. But there are potential disadvantages and challenges that need to be addressed for its successful development and operation. Proper environmental management, social impact assessment, operational planning, financing, regulatory compliance, and geopolitical considerations should be taken into account to mitigate these potential disadvantages and ensure sustainable and successful operations of the port.

Colombo Port offers advantages such as its strategic location, deep draft, well-developed infrastructure, established Transshipment hub status, good connectivity, economic contribution, and trade agreements, which make it an attractive option for international shipping and trade in the Indian Ocean region. The potential disadvantages that Colombo port face are congestion, limited capacity, high costs, competition from regional ports, geopolitical risks, environmental concerns, and operational challenges, which need to be managed effectively to ensure its continued success as a major international port.

ICTT in Kochi offers advantages such as its strategic location, deep draft, modern infrastructure, efficient operations, excellent connectivity, eco-friendly operations, and special economic zone status, making it an attractive option for Transshipment operations and promoting trade in the region. The disadvantages faced are limited hinterland, competition from other ports, port congestion, infrastructural challenges, operational and logistical challenges, environmental and social concerns, and regulatory and policy changes that need to be managed effectively to ensure smooth operations and sustained success as a Transshipment hub.

While both ICTT in Kochi and Vizhinjam Terminal are ports in Kerala, they have some differences in terms of location, operational focus, infrastructure, connectivity, depth of draft, capacity, and operational status. ICTT is an operational Transshipment terminal with a focus on handling Transshipment cargo, while Vizhinjam Terminal is currently under development and planned to be a larger terminal capable of handling both Transshipment and import/export cargo.

While both Vizhinjam Port and Colombo Port are deep-water ports in the Indian Ocean region and serve as Transshipment hubs, they have differences in terms of location, depth, infrastructure, connectivity, trade volumes, and geopolitical considerations. Colombo Port has an advantage of being an established Transshipment hub with well-developed infrastructure and trade relationships, while Vizhinjam Port is a newer port that is still in the process of development. Each port has its own unique strengths and challenges, and their suitability for different trade routes and business requirements may vary depending on various factors.

## BIBLIOGRAPHY

1. Gunawardena, P. and Ariyawansa, R.G., 2017. Opportunities and Challenges for Port of Colombo to become a successful hub port: Comparison of Port of Colombo's performance with the region.
2. Liebuviene, J. and Čižiūnienė, K., 2022. Comparative Analysis of Ports on the Eastern Baltic Sea Coast. *Logistics*, 6(1), p.1.
3. Mallick, P.R., 2017. The potential of Vizhinjam Port as a regional hub: a network analysis: a feasibility analysis from a network perspective.
4. Kavirathna, C., Kawasaki, T., Hanaoka, S. and Matsuda, T., 2018. Transshipment hub port selection criteria by shipping lines: the case of hub ports around the Bay of Bengal. *Journal of Shipping and Trade*, 3(1), pp.1-25.
5. RAJENDRAN, V., 2014. Vizhinjam international seaport emerging transshipment hub port in Indian sub continent.
6. Slack, B. and Gouvernal, E., 2016. Container transshipment and logistics in the context of urban economic development. *Growth and Change*, 47(3), pp.406-415.

## WEBSITES

- <https://www.cogoport.com/en-IN/knowledge-center/resources/port-info/colombo-lkcmb/>
- <https://www.slpa.lk/port-colombo/colombo>
- <https://maritimeindia.org/vizhinjam-port-a-maritime-strategic-capital/>
- <https://economictimes.indiatimes.com/news/economy/infrastructure/govt-to-invite-eois-for-rs-41000-cr-transshipment-port-project-in-great-nicobar-island/articleshow/97366468.cms>