



## Development of Infrastructure and Resources in the Context of the Sagarmala Vadhavan Project: Issues, Challenges and Approaches

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### **Abstract:**

*India is a country blessed with a rich coastline, boasting approximately 7516 km of shoreline and numerous natural harbors. To accelerate maritime trade and coastal development, the central government decided to implement the "Sagar Mala Project." The Vadhavan port in the Palghar district of Maharashtra is an ambitious component of this project, aiming to develop the infrastructure, transportation systems, industrial sites and resources. However, this development is also raising social, environmental and economic concerns. The central government recently approved it under the Sagar Mala scheme. Located near the Western Railway, Mumbai-Delhi Highway, Mumbai-Ahmedabad Highway, Central Railway, Mumbai International Airport and the bullet train route, this port will significantly boost the country's development. While realizing the Sagarmala project, it is imperative to adopt the path of sustainable development while taking care of the environment. The west coast of India is part of the Western Ghats and the Western Ghats are one of the biological hotspots of the world. There is very valuable biodiversity. Therefore, it is imperative to adopt eco-friendly alternatives and technologies while implementing Sagarmala's projects in the Western Ghats.*

**Keywords:** *Geographical Background, Infrastructure, Resource Development, Problems in Project Development, Challenges*

### **Introduction:**

The state and central governments are making continuous efforts to implement various projects to ensure our country rank third in the world in terms of overall development, especially in the economic sector. Considering our country's growing population, with a has become imperative to consider and explore alternatives to land-based resources, focus on marine resources. The ocean provides energy resources such as tidal energy, wave energy, ocean current energy, ocean thermal energy conversion, and biomass energy. To prioritize ocean development plans has become the need of the hour. The Vadhavan port will be developed at an estimated cost of Rs. 76,200 crore, which includes land acquisition, terminals, core infrastructure, and other commercial facilities. The

central and state governments claim that this port will be one of the ten largest ports in the world, as it is expected to create over one million jobs. The 74 percent of the funding for this port's development will come from the central government and 26 percent from the Maharashtra government. The port will be built through a joint venture between Jawaharlal Nehru Port Trust (JNPT) and the Maharashtra Maritime Board.

The importance of the ocean as a food source is increasing today and will continue to grow in the future. This is due to ocean has immense food potential. Similarly, marine food has a good nutritional value. Marine food contains the right proportion of amino acids for human consumption and is a good source of Vitamin B-12. Marine food is low in cholesterol and saturated fat. Among

marine food resources, fish, seaweed and benthic marine resources are considered extremely important. Considering these factors, it is essential to understand the problems, challenges and approaches related to the Vadhavan port and the Sagarmala development project.

Traditionally, the humans have used the oceans for transportation, defense, and fishing. Transportation and fishing are two important economic activities. Fishing is still a major source of food for people. The ocean is vast reservoir of resources. The fact is that due to the tremendous increase in population and the extensive use of land-based resources, humanity's attention is increasingly being drawn to the sea. With the development of modern technology, natural gas, crude oil and minerals are also being extracted from the sea. In this context, significant attention is being paid to marine resources today. The government of India and Maharashtra has set the objectives of developing the Sagarmala project and the Vadhavan port. India has a coastline of 7516 kilometers, along which there are 13 major and 187 medium and small-sized ports. Due to the natural geographical features, ports where boats can safely anchor are called natural ports, while those where artificial protection is provided to ships by building walls along the coastline are called artificial ports and both have proven to be a boon for the country. On the west coast of India, ports like Kandla, Mumbai, Jawaharlal Nehru Port (Nhava Sheva), Mormugao, New Mangalore, Karwar, and Kochi and on the east coast, Tuticorin, Chennai, Visakhapatnam, Kolkata, Paradip and Haldia are major ports contributing to the Indian economy. The government's supportive policies are proving crucial for maritime development. To boost maritime development, the government has adopted policies such as the Sagarmala program, Maritime India Vision 2030, Green Tug Transition (GTT) 2040, Sagar Manthan Dialogue, Maritime Development Fund and

Shipbuilding Financial Assistance Policy (SBFAP 2.0).

#### **Research Objectives:**

1. To explain the geographical background and need for the Vadhavan Sagarmala project.
2. To study the potential impacts of the project on expected infrastructure and resource development.
3. To study the major problems and challenges associated with the project.

#### **Research Methodology:**

This research paper is based on secondary data. Secondary sources such as government reports, reference books, publications of national institutions, information from the internet, port development policies, Sagarmala documents, newspapers, periodicals and academic articles have been used. Conclusions were drawn after analyzing the collected data.

#### **Analysis:**

The development of infrastructure and resources at Vadhavan Port is a key component under the Sagarmala project. This project will significantly boost transportation, industrial, economic, and human resource development in the coastal region of Maharashtra. Firstly, in terms of transportation and connectivity development, Vadhavan Port will be directly connected to national and state highways. This will improve connectivity with the Mumbai-Delhi industrial corridor and other major economic routes. As a result, cargo transportation from the port will become faster, easier and cheaper, leading to a significant reduction in logistics costs. Road transport will become more efficient for local and inter-state trade, accelerating economic transactions.

Furthermore, with the proposal to connect the Vadhavan port to high-speed and high-capacity

railway lines specifically designed for freight transport, containers and cargo can easily reach major industrial centers across the country. Increased use of rail transport will reduce congestion on roads, as well as decrease fuel consumption and pollution. The export-import process will become more efficient, boosting India's foreign trade. Vadhavan port expected to become an important hub for coastal shipping in terms of coastal connectivity. Direct maritime connectivity with ports in Gujarat, Karnataka, Kerala, and on the east coast will increase. Large-scale cargo transport will be possible at a lower cost, realizing the "port-led development" objective of the Sagarmala project.

The development of inland waterways will strengthen the multi-modal transport system. Using rivers and estuaries for heavy cargo transport will save fuel and reduce carbon emissions. This will develop an environmentally friendly transport system, providing new markets for local trade and rural areas. Modern logistics parks will be established in the Vadhavan port area for industrial and economic development. The availability of cold storage, container yards, and transshipment facilities will make the export-import chain faster and more competitive and help improve India's logistics performance index.

The safe storage of agricultural produce, industrial raw materials and finished goods will become possible, making supply chain management more effective. If ship repair and shipbuilding industries are developed in the Vadhavan port area, India's maritime industry can be made globally competitive. The availability of repair facilities for foreign ships will also increase opportunities for earning foreign exchange.

Large-scale employment will be generated in the fisheries, tourism, trade and industrial sectors. Indirect employment opportunities will also increase through transportation, services and ancillary industries. This will help to reduce the

migration of local youth for employment. The value-added industrial use of local fish, agricultural products and other resources will strengthen achieved the local economy and comprehensive development of rural and coastal areas. This will make the local population skilled and create employable the human resources.

#### **Major Problems with the Project:**

The Sagarmala project is an ambitious but controversial project. Because of this project is proposed in the environmentally sensitive coastal region of Palghar district in Maharashtra, it raises several serious concerns. Environmentally, the project is a major cause to concern. Potential damage to mangrove forests could weaken the natural protective barrier of the coastal area. There is also a possibility of adverse effects on marine biodiversity and their habitats. The dredging required for the port could lead to water pollution, coastal erosion and exacerbate the impact of rising sea levels and cyclones caused by climate change.

The movement of large ships raise issues for the fishing community regarding their traditional fishing practices and safety. It could lead to social instability, unemployment, migration and strong opposition and protest from local village councils and fishermen's associations. The issue of land acquisition and displacement is also significant. Acquisition of agricultural land and village areas will have social and economic consequences for rural and tribal communities.

The Vadhavan port project faces numerous challenges at the economic and financial levels as well. With an estimated cost exceeding 70,000 crore, private investor interest may remain limited. There is risk of cost overruns and the project will have to compete with existing major ports like JNPT, Mundra and Kandla. Technical and engineering challenges include the long-term maintenance costs of continuous dredging required to maintain the deep-sea port.

From an administrative and planning perspective, delays in environmental clearances, lack of coordination between the central and state governments, insufficient local participation and objections of environmental impact assessment reports hinder the project's implementation. Furthermore, socio-political opposition, disagreements among political parties, court petitions and legal hurdles increase the likelihood of project delays. From a sustainable development perspective, the project is somewhat inconsistent with sustainable development goals related to environmental protection and local livelihoods. Implementing the 'Green Port' concept is difficult, and there is a fear that the long-term environmental costs will outweigh the economic benefits.

#### **Major Challenges:**

From a geographical and natural perspective, the construction of a deep-sea port and the threat of sea waves, tides, and cyclones constitute geographical and natural challenges. Port projects have a significant impact on the coastal ecosystems such as mangrove vegetation, fisheries, and marine biodiversity. The environmental clearance process is time-consuming, and strict conditions can lead to project delays. Furthermore, carbon emissions from shipping and container movements increase pollution, raising questions about environmental sustainability.

In terms of transportation and connectivity, connecting the port to an effective road and rail network is a major challenge. Lack of proper connectivity to national highways, the Mumbai-Delhi Industrial Corridor, and dedicated freight rail corridors limits the port's efficiency.

Social and human challenges include the rehabilitation of local fishing communities. Port projects are likely to have an adverse impact on fishing and related livelihoods. This can lead to local opposition, public protests, and social unrest, reducing the social acceptability of the project.

In terms of economic and financial challenges, such large port projects require extremely large capital investments. Attracting private investment is difficult due to the high risks involved in the Public-Private Partnership (PPP) model. Furthermore, the long payback period means that profits are likely to be delayed, limiting financial sustainability.

Modern port operations require automation, smart port systems, and advanced technology; however, there is a shortage of the necessary skilled manpower. Additionally, coordinating various systems and departments presents a major challenge in implementation.

Strategic and administrative challenges include land acquisition, various permits, and approval processes. A lack of coordination between central and state governments, along with insufficient long-term planning makes it challenging to complete port development projects on time.

#### **Approaches:**

It is extremely important to adopt Eco friendly approach to develop ports in the future. For this purpose, the active and effective implementation of a "Green Port Policy" is necessary. Under this policy, it is essential to focus on the use of renewable energy sources such as solar and the wind energy in the port areas, the adoption of green fuels and the reducing carbon emissions. The conservation and restoration of mangrove forests will be crucial for maintaining the balance of the coastal ecosystem.

Active participation of local communities in the port development process is essential for long-term sustainability. It is particularly important to implement rehabilitation schemes and skill development programs for local fishing communities, which will provide them with alternative employment opportunities. Organizing dialogue among port authorities, local people,

NGOs, and other stakeholders will reduce disagreements in the development process and build trust. Furthermore, expanding initiatives in education, health, drinking water, sanitation, and women's empowerment will promote social development.

Integrating road, rail, inland waterways, and maritime transport will reduce freight costs and time. Along with this, it is essential to promote coastal shipping as an environmentally friendly and cost-effective option. This will reduce the strain on highways and increase logistics efficiency. In the long term, formulating an industrial investment policy for port-related industrial areas, logistics parks, and special economic zones will boost job creation, export growth, and regional economic development.

For competitiveness in the modern era, adopting smart port technology in the port sector is indispensable. By using internet, big data, and AI-based systems, the movement of ships, cargo storage, and transport management can be made more efficient.

### Conclusion:

India's maritime sector is at a transformative juncture, evolving through strategic initiatives and significant investments. The adoption of sustainable practices and innovative approaches is conducive to establish India as a global maritime leader. With a focus on modernization, efficiency, and environmental sustainability, there is a strong optimism that this project will play a crucial role in the global trade landscape. The Vadhavan Sagarmala project is a vital infrastructure initiative that will give a new direction to India's maritime economy. This project has the potential to create significant opportunities for international trade, industrial growth, job creation, and regional development. However, considering the potential impact on the environment and social structure, planning based on the principles of sustainability,

transparency, and community participation will ensure that this project provides long-term benefits to the national development.

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