



Role Of The Blue Economy In Shaping The Seafood Processing Industry In Gujarat

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Abstract

The economy of our country has taken a specific export-oriented industry having a best specialization in sea food processing industries in Gujarat. The livelihood coastal people and 1% employment absorbed through this salified processing in Gujarat. It's an extensive coastline stretching over 1,600 kilometres is abundant with marine resources. The research gap of this study has given so much stress on the changes in the employment absorbing capacity by them. On the other hand, due to ample foreign demand for their product, the foreword effect on both growth with employment, created a new horizon in the market. Gujurat with more than 3,76,000hectares of coastline and six coastal districts. These ecosystems are rich in biodiversity, providing opportunities, brackish water fisheries to shift from traditional agriculture practices to marine, aquaculture, thereby highlighting the states blue economy. Gujrat's development framework will help the achieve the UN sustainable Development goal 14, "Life below the water". Regular monitoring and innovative marine management thus vital for realizing the full prospective of the blue economy in Gujurat.

Key words: Coastal Resources, Economic, Social and Environment aspect Ratio analysis, Industrial relation

1. INTRODUCTION

The blue economy has emerged as a comprehensive framework for reimagining the way ocean and coastal resources are utilized, shifting away from extractive and short-term exploitation toward a development model grounded in sustainability, environmental protection, and social inclusion. Rather than prioritizing economic output alone, this approach integrates ecological integrity with economic advancement, ensuring that ocean-based activities generate long-term benefits for both present and future generations. It brings together traditional maritime sectors—such as fisheries, shipping, and port development—with newer domains including offshore renewable energy, marine biotechnology, and sustainable coastal tourism, all operating within environmentally responsible limits.

2. Concept and Importance of the Blue Economy

The intellectual foundations of the blue economy can be traced to the work of Professor Gunter Pauli in the mid-1990s, who advocated for economic systems inspired by natural processes that minimize waste and emissions. The concept gained international momentum following its recognition at the

Rio+20 Conference and its incorporation into the United Nations Sustainable Development Goals, particularly SDG 14, which emphasizes the sustainable use and conservation of marine resources. At its core, the blue economy promotes development pathways that support economic growth while preserving marine ecosystems and enhancing social well-being (Pauli, 2010).

With its extensive 7,517-kilometre coastline and large Exclusive Economic Zone, India is uniquely positioned to leverage ocean resources as a driver of national development. In recent years, the country has strengthened its institutional and policy frameworks to advance the blue economy agenda, including the establishment of ocean-focused governance mechanisms and initiatives such as the Deep Ocean Mission (Government of India, 2021). India's maritime domain is central to international trade, energy supply chains, and employment, sustaining the livelihoods of more than four million people living in coastal regions. Acknowledging this strategic importance, the blue economy has been integrated into India's Vision 2030 as a key instrument for economic expansion, job creation, and marine ecosystem conservation.

The post-COVID-19 global environment, characterized by economic restructuring and increased attention to sustainability, offers India a critical opportunity to responsibly scale up its ocean-based industries. By promoting innovation, strengthening maritime infrastructure, and conserving marine biodiversity, the blue economy can enhance economic resilience while contributing to national security and sustainable development objectives (NITI Aayog, 2021).

Leading international organizations have further clarified and reinforced the meaning of the blue economy. The World Bank defines it as the sustainable utilization of ocean resources to promote economic growth, employment, and improved livelihoods without compromising the health of marine ecosystems. The Asian Development Bank similarly highlights the need for a balanced ocean economy that aligns economic progress with the protection of marine and coastal environments, fostering inclusivity and resilience. The United Nations firmly situates the blue economy within the framework of SDG 14, underscoring its role in ensuring the long-term sustainability of oceans and seas. Together, these interpretations emphasize that the blue economy is fundamentally anchored in sustainability, equity, and ecological responsibility (World Bank, 2017).

In India, the blue economy has emerged as a significant pillar of national development, supported by the country's extensive maritime geography, including a coastline of approximately 11,098 km and an Exclusive Economic Zone (EEZ) spanning nearly 2.4 million km². Recognizing the strategic, economic, and ecological importance of ocean resources, the Ministry of Earth Sciences (MoES), designated as the nodal agency, has prepared a Draft National Policy on the Blue Economy. The policy conceptualizes the blue economy as an integral component of the national economy, encompassing ocean resources alongside human-made economic infrastructure across marine, maritime, and coastal zones within India's legal jurisdiction. It emphasizes the production of goods and services that contribute to economic growth while ensuring environmental sustainability and reinforcing national security (MoES, 2021). This definition is particularly significant as it integrates natural capital with built infrastructure and explicitly links economic objectives with ecological responsibility and strategic interests.

The growing importance of the blue economy is further reflected in its inclusion as a priority sector within India's long-term development frameworks, notably *Viksit Bharat 2047*. Under the "New India by 2030" vision, the blue economy is identified as one of ten core growth areas, with an ambitious target of achieving a USD 100 billion ocean-based economy through initiatives such as the Deep Ocean Mission and the sustainable utilization of marine resources (Government of India, 2022). At the international level, the adoption of the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement in June 2023 represents a major advancement in global ocean governance. The agreement aims to conserve marine biodiversity in areas beyond national jurisdiction by promoting sustainable use and ensuring equitable sharing of benefits derived from marine genetic resources (United Nations, 2023).

The Ministry of Earth Sciences (MoES) plays a central coordinating role in India's ocean governance framework, overseeing a wide range of activities that collectively strengthen the country's leadership in sustainable marine management (Government of India, 2021). Beyond MoES, as many as 24 central ministries contribute to the blue economy agenda, including the Ministry of Ports, Shipping and Waterways; the Ministry of Fisheries, Animal Husbandry and Dairying; and the Ministry of Environment, Forest and Climate Change. These institutions are responsible for implementing several major policy initiatives, such as the Blue Revolution launched in 2020 to promote sustainable fisheries, the Deep Ocean Mission initiated in 2021, and multiple programmes under the Maritime India Vision 2030 framework. Complementing national efforts, sub-national actions are being undertaken by nine coastal states and four coastal Union Territories, reflecting a multi-level governance approach to ocean-based development.

India's commitment to the blue economy has also been reinforced at the international level. During its G20 Presidency in 2023, India facilitated global consensus on the need to conserve, restore, protect, and sustainably utilize oceans and marine ecosystems. This collective commitment underscored the importance of integrating sustainability and resilience into the global blue economy agenda (NITI Aayog, 2021).

Within the national development discourse, the blue economy is increasingly recognized as a critical driver of sustainable growth. By leveraging its extensive maritime resources, India's ocean-based sectors—particularly fisheries, shipping, port infrastructure, and coastal tourism—make substantial contributions to economic output, employment generation, and livelihood security. At the same time, the blue economy stands at a pivotal juncture, offering significant opportunities to advance inclusive growth while responding to challenges such as climate change, resource depletion, and socio-economic inequalities. Realizing this potential requires a balanced strategy that simultaneously prioritizes economic expansion, environmental conservation, social equity, maritime security, and the adoption of smart and emerging technologies (MoES, 2021).

3. Review of Literature

Research on the blue economy has grown rapidly in recent years, showing its increasing importance in global development and sustainability (UNEP, 2016). Early studies focused on explaining the concept and its scope, while later work discussed challenges, equity issues, and economic opportunities. Many studies examined specific sectors such as fisheries, oil and gas, private sector participation, and tourism. However, because the blue economy covers many fields, the research remains scattered, with studies often working separately and lacking a common framework to connect these different areas (Voyer et al., 2018).

Mushthak (2025) —The literature highlights India's Blue Economy as an important pathway for inclusive and sustainable growth, supported by the country's long coastline, large Exclusive Economic Zone, and strategic maritime position. Studies emphasise the need for a science-based and multi-stakeholder approach that balances economic development with marine conservation and community participation. However, challenges such as marine pollution, climate change impacts, overexploitation of resources, and fragmented governance continue to limit its full potential. Addressing these issues is essential for building a resilient and sustainable blue economy.

Bagchi et al. (2005) showed that Gujarat's economic growth between 1970–71 and 2000–01 was uneven, with stagnant organized sector employment and declining agricultural employment. Although the secondary and tertiary sectors grew rapidly, this growth was largely employment-poor, resulting in unbalanced and volatile sectoral development.

Dixit (2009), while studying economic growth and non-agricultural employment in Gujarat, found that while there is a continuous decline in employment in the agricultural sector at the all-India level. On the contrary, employment in the agricultural sector remains stable in the state of Gujarat. According to her, employment related decisions at the household level are income-dependent. She concluded that while in the lower income group, diversification of employment is determined by inadequate means of agricultural production, whereas in the higher income group, the diversification of employment is determined by the ownership of non-agricultural assets and higher education level.

Cortuk and Singh (2010) analysed India's economic growth and structural transformation from 1951 to 2007. Their study revealed that, over the full period, there was no clear relationship between growth and structural change. However, when the timeframe was split, a significant positive link was observed for 1988–2007, indicating that structural shifts became more aligned with economic growth during the later years.

According to Thind and Singh (2018), the service sector in Gujarat's economy increased its share from 44% in 2002–03 to 57% in 2014–15. Meanwhile, the contribution of agriculture and allied activities fell from 28% to 18%, and manufacturing declined from 17% to 8% over the same period. The Norm of Absolute Value Index for Gujarat was 0.180 for 1980–81 to 2014–15, and 0.045 for 1993–94 to 2014–15, reflecting a decline in structural disparities over time.

Studies on Gujarat's coastal development suggest that blue economy-led investment projects have intensified pressures on coastal ecosystems and increased the risk of eviction and livelihood alienation among traditional fishing communities. Blue Growth initiatives in the Gulfs of Gujarat are often associated with the enclosure and extraction of natural capital, benefiting large domestic and multinational corporations. Critical literature argues that policy frameworks favouring financialization and digitalisation have further marginalised informal and coastal livelihoods. These processes have contributed to growing economic concentration, inequality, and concerns over the social sustainability of blue economy-driven development in Gujarat.

Gowri Ramesh (2005) India's Blue Economy represents a transformative opportunity to foster inclusive, resilient, and environmentally sustainable growth. With a vast coastline of over 7,500 kilometres, an extensive Exclusive Economic Zone (EEZ), and a strategic maritime position, India is uniquely positioned to become a global leader in ocean governance and marine-based economic development. To realize this potential, a science driven, multi stakeholder strategy is essential one that harmonizes economic development with the conservation of marine ecosystems, community empowerment, and robust international cooperation. Aligning national efforts with global frameworks such as the United Nations Sustainable Development Goals (SDG 14: Life Below Water) and the United Nations Convention on the Law of the Sea (UNCLOS) will be critical. However, achieving a thriving Blue Economy will require overcoming significant challenges, including marine pollution, climate change impacts, overexploitation of resources, and regulatory fragmentation. A resilient, future ready Blue Economy will be rooted in sustainability, innovation, and inclusivity, ensuring long-term benefits for both people and the planet.

4. Research Objectives

The study aims to:

1. Examine the role of fisheries, port infrastructure, ship recycling, and coastal ecosystems in Gujarat's Blue Economy.
2. Analyse trends in marine and inland fisheries production and their implications for sustainability.
3. Assess policy effectiveness in balancing economic growth, environmental protection, and community welfare.

5. Methodology

The study adopts a descriptive and analytical methodology based on secondary data sourced from government reports, policy documents, statistical handbooks, and published literature. Trend analysis is employed to examine fisheries production, while qualitative policy analysis is used to evaluate institutional and governance frameworks. Tables and figures are used to support empirical interpretation.

6. Legal Framework Governing the Blue Economy in India

A well-defined legal framework is essential for promoting the sustainable development of India's Blue Economy (NITI Aayog, 2021). It ensures the responsible use of marine resources, safeguards ecological balance, and aligns national economic goals with global sustainability commitments (United Nations, 2015). India's legal structure governing the Blue Economy is shaped by a combination of national laws, policies, and international agreements (GOV, 2021). India's Blue Economy operates within a robust and evolving legal framework encompassing national statutes, policies, and international conventions (GOV, 2022). This framework aims to regulate resource use, protect marine environments, and ensure equitable development across maritime sectors (United Nations, 2015)

1) **National Initiatives** India has embarked on a multifaceted journey to operationalize its Blue Economy vision, focusing on sustainable resource utilization, economic growth, and community empowerment through a series of strategic national initiatives ((NITI Aayog, 2021).

2) **Sagarmala Programme** This flagship initiative spearheads the modernization of India's port infrastructure and promotes port led industrialization to enhance trade competitiveness. Sagarmala integrates multimodal transport networks road, rail, and inland waterways facilitating seamless connectivity and logistics optimization. Key objectives include reducing freight costs, accelerating export growth, fostering coastal economic zones, and generating employment, particularly in underserved coastal regions. The programme also promotes sustainable coastal community development by integrating local stakeholders into maritime value chains (NITI Aayog, 2021).

3) **Deep Ocean Mission** Launched under the aegis of the Ministry of Earth Sciences; this pioneering mission aims to harness the untapped potential of India's deep sea resources¹⁰. It prioritizes the exploration of polymetallic nodules, rare earth minerals, and bioprospecting of marine biodiversity beyond the continental shelf. The mission encompasses the development of cutting-edge technologies such as autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), and oceanographic research platforms. A critical focus area is understanding ocean climate interactions and establishing frameworks for sustainable deep-sea resource extraction with minimal ecological disturbance (MoES, 2021).

4) **PM Matsya Sampada Yojana (PMMSY)** This flagship scheme aimed at enhancing fish production through sustainable aquaculture, modernizing fisheries infrastructure, and improving livelihoods of fisher communities. It promotes mechanization, cold chain development, biosecurity measures, and skill building, while encouraging eco-friendly practices and value-added exports.

5) **Maritime India Vision 2030** It outlines India's strategy to become a global maritime hub by expanding shipbuilding, developing coastal tourism, promoting marine renewable energy like offshore wind and tidal power, and strengthening maritime skill development¹². It also highlights the importance of strengthening maritime security frameworks to safeguard sea lanes vital to national and regional trade¹³.

6) **Regional Cooperation Initiatives** India's active engagement in regional forums such as the Indian Ocean Rim Association (IORA), BIMSTEC, and the Bay of Bengal Initiative underscores its commitment to collaborative maritime governance. These platforms facilitate cooperative efforts in combating

marine pollution, enhancing disaster risk reduction capacities, managing shared fisheries, and promoting blue economy-led sustainable development. Regional partnerships amplify India's voice in shaping collective maritime security and environmental policies¹³.

7) **Oceanographic Satellite and Research Infrastructure** Recognizing the critical role of data-driven decision-making, India has invested significantly in ocean observation capabilities. The Indian Space Research Organisation (ISRO) operates dedicated oceanographic satellites providing real time data on sea surface temperature, chlorophyll concentration, and marine weather patterns. Complemented by an expanding fleet of research vessels and coastal observation stations, these assets support scientific research, maritime surveillance, and climate change impact assessments²⁴. These initiatives form the backbone of India's integrated approach to Blue Economy development balancing economic ambitions with ecological sustainability and social inclusiveness.

8) **Marine Fisheries Regulation Act, 1978** Regulates fishing in territorial waters through licensing, gear controls, and conservation zones to prevent overfishing and protect marine biodiversity and fisher livelihoods.

9) **Environment Protection Act, 1986** Enables regulation of marine pollution from land and sea-based sources by setting discharge standards for coastal industries and maritime operations.

10) **Coastal Regulation Zone (CRZ) Notifications:** Define ecologically sensitive coastal zones, restricting development to protect mangroves, coral reefs, wetlands, and prevent habitat loss and erosion.

3.1.10 **Maritime Zones Act, 1976** Legally establishes India's maritime boundaries, granting rights over territorial waters, EEZ, and continental shelf for resource management and maritime security.

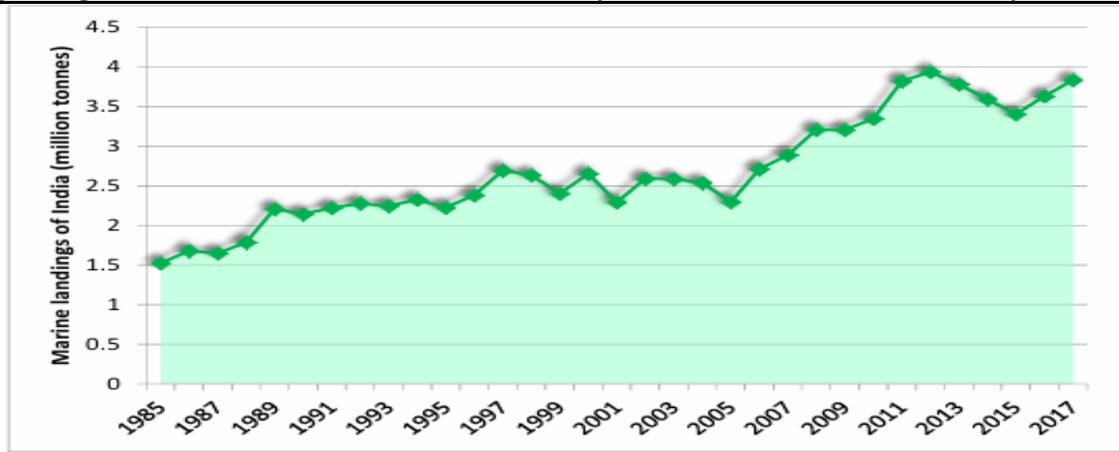
11) **Merchant Shipping Act, 1958 (Amended 2020)** Regulates merchant shipping with provisions on safety, pollution control, and seafarer welfare, aligned with international maritime standards.

12) **National Policy on Marine Fisheries (2017)** Promote sustainable, ecosystem-based fisheries management combining science and traditional knowledge for resource conservation and community upliftment.

13) **National Biodiversity Action Plan** Focuses on marine habitat protection, endangered species conservation, and ecosystem restoration in line with the Convention on Biological Diversity. These frameworks ensure sustainable marine resource use, environmental protection, coastal community welfare, and maritime security (NITI Aayog, 2021).

7. Current Status of Marine Fisheries of India

India's marine fisheries sector has recorded substantial expansion over the past four decades. Marine fish landings increased from approximately 1.52 million tonnes in 1985 to about 3.83 million tonnes by 2017, reflecting both technological intensification and increased fishing effort. During this period, India accounted for around 4.5 per cent of global marine capture fish production in 2016 and contributed an average of 4.6 per cent to global marine capture fisheries output between 2011 and 2016 (Ministry of Fisheries, 2020).



Marine fisheries landings in India (1985-2017) Source: ICAR-CMFRI

The composition of marine landings reveals a persistent dominance of pelagic resources, which accounted for nearly 51 per cent of total marine production during 1985–2017. Pelagic landings rose from about 0.7 million tonnes in 1985 to nearly 2.0 million tonnes by 2017, driven primarily by species such as oil sardine, mackerel, and tuna. Demersal resources formed the second-largest group, contributing roughly 26 per cent of total landings, with production increasing from about 0.4 million tonnes in 1985 to nearly 1.0 million tonnes in 2017. Crustaceans and molluscs contributed approximately 15.6 per cent and 4.3 per cent of marine landings, respectively, underscoring the commercial significance of high-value species within India's fisheries basket.

India's revised Potential Yield Estimate (PYE) for marine fisheries, assessed in 2018, stands at 5.31 million metric tonnes. Nearly 94.5 per cent of the maximum sustainable yield is concentrated within waters up to 500 m depth, while oceanic regions contribute about 4.3 per cent and island ecosystems account for nearly 1.0 per cent of the estimated potential. At present, India harvests approximately 77.8 per cent of its near-shore PYE (up to the 200 m depth contour), indicating that coastal fisheries are approaching biological and ecological limits.

Despite sustained growth in aggregate landings, India's near-shore marine fisheries face multiple structural and ecological challenges. These include overcapacity of fishing fleets, declining catch per unit effort (CPUE), reduction in the average size of commercially important species, and noticeable shifts in species composition. Coastal habitat degradation, pollution from land-based sources, and climate-induced changes in oceanographic conditions further exacerbate resource stress (FAO, 2018).

These trends suggest that production gains in near-shore fisheries are increasingly effort-driven rather than stock-driven, raising concerns regarding long-term sustainability. Continued reliance on coastal waters without effective effort regulation and ecosystem-based management risks stock depletion and livelihood insecurity for small-scale fishers.

Deep-sea fisheries, operating between depths of 200 and 2,000 meters within the Exclusive Economic Zone and in Areas Beyond National Jurisdiction, represent a potential frontier for India's marine fisheries expansion. The country's estimated harvestable potential in these regions is approximately 3.3 million metric tonnes. However, the transition toward deep-sea fishing requires substantial investment in vessels, technology, scientific stock assessment, and regulatory frameworks to ensure ecological sustainability and economic viability.

8. Gujarat status:

Gujarat holds a strategically significant position in India's Blue Economy due to its extensive and resource-rich coastline. With a coastline of approximately 1,650 km, the state accounts for nearly 19.7 per cent of India's total coastline and about 46 per cent of the western coastline, making it the longest coastal state in the country (CMFRI, 2010; Government of Gujarat, 2019). This geographical advantage is further reinforced by a continental shelf area of around 184,000 sq. km and an Exclusive Economic Zone (EEZ) of approximately 214,000 sq. km, offering substantial potential for marine fisheries, off-shore resources, and maritime economic activities.

The Gujarat coastline can be broadly divided into five distinct coastal regions:

- (i) the Gulf of Kachchh,
- (ii) the Gulf of Khambhat,
- (iii) the Saurashtra Coast,
- (iv) the South Gujarat Coast, and
- (v) the Rann of Kachchh.

Among India's three major gulfs, Gujarat uniquely hosts two—the Gulf of Kachchh and the Gulf of Khambhat, both of which are ecologically and economically significant. These regions support diverse marine ecosystems, including mangroves, coral reefs (particularly in the Gulf of Kachchh), tidal mud-flats, and productive fishing grounds, while also serving as hubs for port development, ship recycling, and coastal industries (CMFRI, 2010; NITI Aayog, 2021).

Administratively, Gujarat comprises twelve coastal districts, namely Valsad, Navsari, Surat, Bharuch, Anand, Bhavnagar, Amreli, Junagadh, Porbandar, Jamnagar, Rajkot, and Kutch. According to the CMFRI Marine Census (2010), the state has 247 marine fishing villages, with the largest concentration (68 villages) located along the Gulf of Kachchh. These coastal settlements form the socio-economic foundation of Gujarat's marine fisheries sector and support a large population of artisanal and mechanized fishers.

Gujarat's coastal geography provides a natural comparative advantage for marine fisheries and maritime industries. However, the concentration of fishing activity in near-shore waters, especially in the gulfs, has intensified ecological pressures, necessitating a shift towards sustainable fisheries management, deep-sea fishing, and marine spatial planning under the Blue Economy framework (FAO, 2018; Ministry of Fisheries, 2020).

In addition to its marine endowments, Gujarat possesses a wide range of inland fishery resources, making it one of India's leading inland fisheries states. These resources include rivers, canals, reservoirs, ponds, tanks, estuaries, brackish water impoundments, and waterlogged areas, which collectively support capture fisheries, aquaculture, and livelihood diversification (CMFRI, 2010; Government of Gujarat, 2019).

The total length of rivers and tributaries in Gujarat is approximately 3,865 km, with major river systems such as the Narmada, Tapi, Sabarmati, and Mahi playing a crucial role in sustaining inland fisheries and enriching coastal and estuarine ecosystems through nutrient inflows. Reservoirs in the state cover an area of about 3.48 lakh hectares, while estuarine areas extend over 212.30 sq. km, providing important breeding and nursery habitats for several commercially important fish species (Government of Gujarat, 2019).

A particularly significant component of Gujarat's inland fisheries is its brackish water resource base, which spans nearly 3.76 lakh hectares across 14 coastal districts and approximately 1,600 km of coastline. This makes Gujarat the second-largest brackish water resource state in India, after West Bengal. These areas are well suited for shrimp farming, crab culture, and emerging activities such as seaweed cultivation, which are increasingly promoted under the Blue Economy and PM Matsya Sampada Yojana (Ministry of Fisheries, 2020; NITI Aayog, 2021).

The state supports around **716 inland fishing villages**, with a fisher population of approximately **2.31 lakh**, underscoring the sector's importance for rural livelihoods and food security. During **2019–20**, Gujarat's inland fish production reached **1.57 lakh metric tonnes**, reflecting the impact of targeted policy support, infrastructure development, and technological interventions in aquaculture (Government of Gujarat, 2019; Ministry of Fisheries, 2020).

The growth of inland fisheries in Gujarat represents a strategic response to stagnation and ecological stress in near-shore marine fisheries. Expansion of reservoir fisheries, brackish water aquaculture, bio-floc systems, cage culture, and hatchery development has helped diversify production sources, stabilize fisher incomes, and reduce pressure on marine ecosystems. This diversification aligns closely with the Blue Economy's emphasis on sustainability, resilience, and inclusive growth (NITI Aayog, 2021).

The coexistence of a robust **marine fisheries base** and a rapidly expanding **inland fisheries sector** provides Gujarat with a unique platform to operationalize the Blue Economy in a balanced and sustainable manner. Marine fisheries continue to play a central role in exports and coastal employment, while inland fisheries contribute increasingly to production growth, climate resilience, and livelihood security.

From a Blue Economy perspective, Gujarat's fisheries sector highlights the importance of:

- **Resource diversification** to mitigate ecological and economic risks,
- **Marine and inland spatial planning** to manage competing uses, and
- **Policy-driven technological modernization** to enhance productivity without compromising environmental sustainability.

Together, Gujarat's marine and inland fisheries systems form an integrated production base that supports economic growth, food security, employment generation, and ecosystem conservation—core objectives of India's Blue Economy vision (NITI Aayog, 2021; Ministry of Fisheries, 2020).

9. Gujarat's Marine and Inland Fisheries Resource Base

Gujarat occupies a strategically significant position in India's marine and inland fisheries landscape owing to its extensive and diverse aquatic resource base. The state possesses the longest coastline in India, extending approximately 1,650 km, which constitutes nearly 19.7 per cent of the national coastline and about 46 per cent of India's western coastline. In addition, Gujarat is endowed with a continental shelf area of around 184,000 sq. km and an Exclusive Economic Zone (EEZ) of approximately 214,000 sq. km, providing substantial scope for marine capture fisheries, mariculture, and offshore resource development.

The coastline of Gujarat is geographically differentiated into five distinct coastal regions, namely the Gulf of Kachchh, Gulf of Khambhat, Saurashtra Coast, South Gujarat Coast, and the Rann of Kachchh. Notably, two of India's three major gulfs—the Gulf of Kachchh and the Gulf of Khambhat—are located along the Gujarat coast, underscoring the state's maritime significance. Administratively, Gujarat comprises twelve coastal districts, including Valsad, Navsari, Surat, Bharuch, Anand, Bhavnagar, Amreli, Junagadh, Porbandar, Jamnagar, Rajkot, and Kutch. According to the CMFRI Marine Census (2010),

the state hosts 247 marine fishing villages, with the highest concentration (68 villages) situated along the Gulf of Kachchh, reflecting the region's importance for marine fisheries and fishing livelihoods.

11. Inland Fishery Resources of Gujarat

In addition to its marine assets, Gujarat is richly endowed with diverse inland fishery resources, positioning it among the leading inland fisheries states in India. These resources encompass rivers, canals, estuaries, ponds, reservoirs, brackish water bodies, waterlogged areas, and seasonal wetlands, which collectively support capture fisheries and aquaculture development (CMFRI, 2010; Government of Gujarat, 2019). The total length of rivers and tributaries in the state is estimated at approximately 3,865 km, while reservoirs cover about 3.48 lakh hectares and estuaries extend over nearly 212.30 sq. km. Major river systems such as the Narmada, Tapi, Sabarmati, and Mahi play a critical role in sustaining inland fisheries while also contributing to coastal and estuarine productivity.

Gujarat also possesses the second-largest brackish water potential area in India, estimated at around 3.76 lakh hectares, spread across 14 coastal districts and nearly 1,600 km of coastline, second only to West Bengal. This vast brackish water resource base provides significant opportunities for shrimp farming, coastal aquaculture, and export-oriented fisheries. The inland fisheries sector supports approximately 716 inland fishing villages, with a fisher population of about 2.31 lakh, highlighting its socio-economic importance.

During 2019–20, Gujarat recorded an inland fish production of approximately 1.57 lakh metric tonnes, reflecting the state's sustained policy focus and institutional efforts to strengthen both inland and marine fisheries. From a Blue Economy perspective, the integration of marine and inland fisheries enhances resource diversification, reduces pressure on near-shore marine stocks, and supports livelihood resilience and sustainable growth within Gujarat's coastal and inland regions.

Resource Type	Area / Length
Rivers & Canals	3,865 km
Reservoirs	2.43 lakh ha
Tanks & Ponds	0.71 lakh ha
Floodplain Lakes / Derelict Waters	0.12 lakh ha
Brackish Water Area – Khar Lands	3.76 lakh ha
Potential Area	1.87 lakh ha
Estuarine Area	0.21 lakh ha

These resources provide the backbone for inland fisheries, supporting livelihoods, boosting food security, and complementing the coastal and marine sectors of Gujarat's Blue Economy.

Table 1: Recent Gujarat Fish Production (2020–21 to 2025–26)

Year	Marine (Lakh MT)	Inland (Lakh MT)	Total (Lakh MT)
2020–21	7	2.3	9.3
2021–22	7.1	2.4	9.5
2022–23	7.3	2.5	9.8
2023–24	7.05 ¹	2.03 ¹	9.08 ¹
2024–25	7.64 ¹	2.72 ¹	10.36 ¹

2025–26*	8.40 ¹	3.31 ¹	11.71 ¹
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Projected Fish Production in Gujarat (FY 2025–26)

Gujarat's total fish production is projected to reach 11.71 lakh MT in FY 2025–26, a 26% increase since 2020–21 (CMFRI, 2010; Government of Gujarat, 2023). This growth reflects improvements in marine and inland yields due to initiatives like PM Matsya Sampada Yojana (PMMSY), infrastructure expansion, and coastal development under the Blue Economy framework (Ministry of Fisheries, 2020; NITI Aayog, 2021).

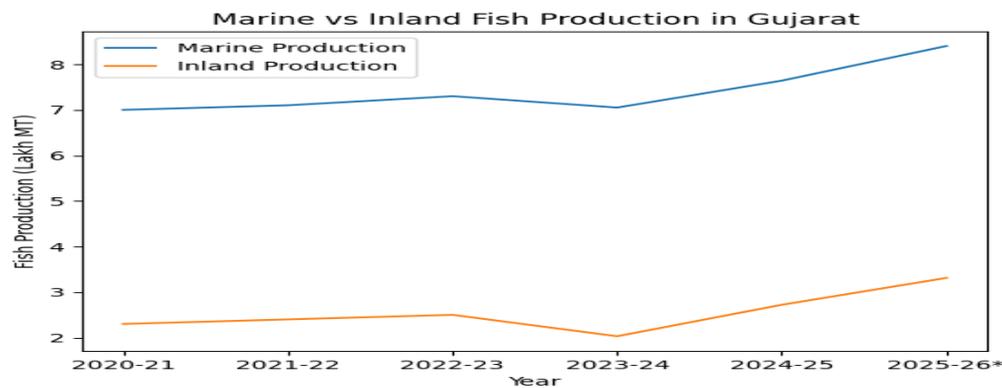


Figure illustrates marine and inland fish production trends in Gujarat. While marine fisheries remain the dominant contributor, inland fisheries have recorded faster growth in recent years, particularly after 2023–24. Inland production is projected to rise from 2.03 lakh MT in 2023–24 to 3.31 lakh MT by 2025–26, reflecting policy support for biofloc systems, RAS, cage culture, and hatchery development. This diversification reduces pressure on near-shore marine resources and ensures year-round raw material Adoption of Blue Economy (BE) in Gujarat:

Gujarat has emerged as one of India's fastest-growing industrial states, supported by a forward-looking policy environment aimed at facilitating private investment and accelerating economic transformation. A series of sector-specific policies and legislative instruments have been designed to position Gujarat as a leading industrial and maritime hub, thereby contributing to national economic growth. In this context, coastal infrastructure development and its associated regulatory frameworks collectively serve as an operational roadmap for implementing India's Blue Economy and blue growth model at scale.

A review of Gujarat's maritime policies and legal instruments indicates that they function as key institutional drivers for the adoption of the Blue Economy framework. In particular, port-led development initiatives under the Sagarmala Programme, implemented along the **Gulf of Kachchh** and the **Gulf of Khambhat**, have been identified as central components of Gujarat's Blue Economy strategy. These initiatives integrate port infrastructure, coastal industrialization, and logistics networks, thereby supporting regional economic development while aligning with national blue growth objectives (GOV, 2021).

12. Objectives of the Blue Economy

Gujarat's Blue Economy strategy is guided by a set of interrelated objectives aimed at achieving sustainable and inclusive maritime development. These include:

- Enhancing overall fish production through responsible and sustainable utilization of marine and inland resources to support economic prosperity;
- Modernizing fisheries and aquaculture with a special emphasis on the adoption of advanced technologies and infrastructure;
- Ensuring food and nutritional security;

- Generating employment opportunities and increasing export earnings from marine-based sectors; and
- Promoting inclusive development by empowering fishers and aquaculture farmers.

13. Policies and Legal Frameworks Supporting Blue Growth

The Gulf of Kachchh and the Gulf of Khambhat are ecologically sensitive regions, and industrial development alone is insufficient to address the associated environmental and socio-economic challenges. Recognizing this, the Gujarat Maritime Board (GMB) introduced the Integrated Maritime Policy (2017) to promote port-led regional development while ensuring sustainability across multiple sectors, including aquaculture, marine biotechnology, ocean-based energy, and seabed resources.

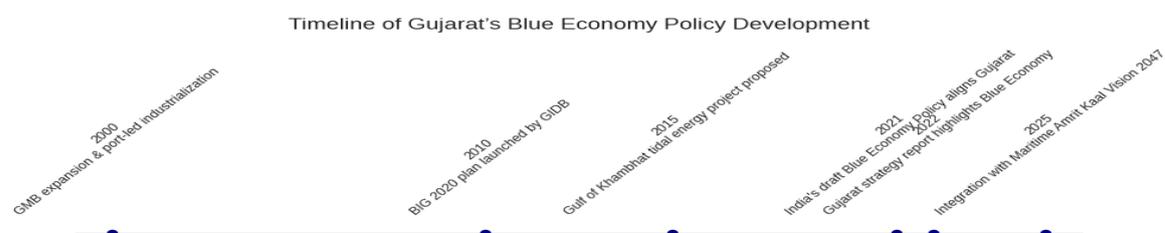
Key strategic instruments under this policy include Maritime Spatial Planning, which seeks to rationalize competing sea-based activities, and Integrated Maritime Surveillance, which strengthens monitoring, compliance, and maritime security. Further reforms were introduced through the New Captive Port Policy (2019), which permitted existing port and jetty operators to handle third-party cargo and facilitated greater private sector participation. Through these measures, Gujarat became the first Indian state to extensively privatize its port sector, significantly accelerating maritime infrastructure development and reinforcing blue growth-oriented coastal economic expansion (GMB, 2017; GMB, 2019; NITI Aayog, 2021).

Overall, Gujarat's marine and inland fisheries, robust coastal infrastructure, and progressive policy environment collectively position the state as a model for implementing India's Blue Economy vision. The Gujarat experience demonstrates how economic growth objectives can be pursued alongside ecological sustainability and community welfare through integrated governance and long-term maritime planning.

Gujarat, with its 1,600-kilometer coastline—the longest in India, has long benefited from the abundance of the sea. Over the past four years, the state has maintained an impressive average marine fish production of 8.5 lakh tonnes annually and contributes about 17% of India's total fish exports, valued at Rs 5,000 crore (CMFRI, 2010; Government of Gujarat, 2019).

Looking ahead, Gujarat is encouraging its traditional fishing communities to adopt modern technologies and explore deep-sea fishing beyond the continental shelf, aiming to unlock new marine resources and further strengthen the state's Blue Economy (Ministry of Fisheries, 2020; NITI Aayog, 2021).

In 2023–24, Gujarat produced 7,04,828 metric tonnes of marine fish and 2,03,073 metric tonnes of inland fish, totaling 9,07,901 metric tonnes, reflecting the state's consistent growth in fisheries and its focus on sustainable expansion (Government of Gujarat, 2023).



1. **2000s:** Expansion of Gujarat Maritime Board (GMB) and rapid port-led industrialization.
2. **2010:** Gujarat Infrastructure Development Board (GIDB) launches *BIG 2020* plan for coastal infrastructure.

3. **2015:** Gulf of Khambhat Development Project proposed for tidal energy and industrial corridor.
2021: India's draft *Blue Economy Policy Framework* aligns Gujarat's initiatives with national vision.
4. **2022:** Gujarat's economic growth strategy report highlights Blue Economy as a key driver for achieving a \$500 billion economy by 2026–27.
5. **2025:** Integration with *Maritime Amrit Kaal Vision 2047* for sustainable ocean economy.¹⁷

Table: 2 Fish production, cargo intake and policy

Year	Marine Fish Production (lakh tonnes)	Port Cargo (million tonnes)	Key Policy Milestone
2010	6.5	250	BIG 2020 plan launched
2015	7.8	350	Gulf of Khambhat project proposed
2020	9.2	450	Shrimp aquaculture expansion
2022	9.8	500	Blue Economy policy alignment
2024	10.5	540	Socio-Economic Review highlights growth

Sources: Gujarat Socio-Economic Review 2023–24, Blue Economy in Gujarat studyblueeconomytribunal.org, Navajivan News report on fisheries growth.

Table : 3 Year-Wise Production Estimates (Lakh Metric Tonnes, MT)

YEARS	Marine Production	Inland Production	Total Fisheries Output
2020–21	~7.0	~2.3	~9.3
2021–22	~7.1	~2.4	~9.5
2022–23	~7.3	~2.5	~9.8
2023–24	~7.5	~2.6	~10.1
2024–25*	7.64	2.72	10.36
2025–26*	Projected	Projected	>11.0

Source: <https://static.pib.gov.in>

The contraction in fisheries production in 2020–21 reflected the adverse impacts of the COVID-19 pandemic, including disruptions in fishing operations, supply chains, labour availability, and export demand (CMFRI, 2021). From 2021–22 onwards, Gujarat's fisheries sector has demonstrated steady recovery and sustained growth, highlighting the resilience of the sector, supported by targeted policy measures and Blue Economy initiatives (Ministry of Fisheries, 2020; NITI Aayog, 2021).

Year-wise production estimates show a consistent upward trend, increasing from around 9.3 lakh MT in 2020–21 to 10.36 lakh MT in 2024–25, with total production projected to exceed 11 lakh MT by 2025–26 (Government of Gujarat, 2023). Both marine and inland fisheries have grown steadily, with

inland production expanding at a relatively faster pace in recent years. This growth reflects the combined effects of policy support, technological modernization, and infrastructure development under the Blue Economy framework.

Overall, Gujarat's fisheries sector demonstrates strengthened productive capacity and resilience, reinforcing its strategic role in India's Blue Economy and supporting value addition and expansion in the seafood processing industry (CMFRI, 2021; Ministry of Fisheries, 2020).

projections for the 2024–25 season estimate marine fish output at 7,64,343 metric tonnes and inland production at 2,72,430 metric tonnes. This would push total fish production to around 10,36,773 metric tonnes. The government is playing a crucial role in supporting this sector. Under the Pradhan Mantri Matsya Sampada Yojana (PMMSY), Gujarat has secured project approvals worth ₹897.54 crore from 2020 to 2024. For the upcoming 2025–26 year, the central government has allocated an additional ₹50 crore to enhance fisheries infrastructure in the state.

1. For the fiscal year 2025–26, the state has outlined several initiatives aimed at increasing fishery productivity and supporting local fisherfolk. These initiatives include:
2. Support for Bio floc and Recirculating Aquaculture Systems (RAS). Financial aid for preparing shrimp ponds, which includes the purchase of medicines, minerals, and probiotics.
3. Assistance for cage culture, known locally as Bhambharapani.
4. Help in establishing modern boat-building yards, cold storage facilities, and blast freezers.
5. Provision of replacement boats and nets for traditional fishermen.
Incentives for setting up fish by-product processing units, seaweed seed banks, and shrimp/fish/crab hatcheries.
6. Support for seaweed cultivation (NITI Aayog, 2021).

These comprehensive initiatives are helping to strengthen Gujarat's position as a leader in the fisheries sector. The state is not only enhancing fish production but also contributing to sustainable marine resource development and improving rural livelihoods (MoF, 2020). The Blue Economy concept promotes the balanced use of marine resources, ensuring that economic growth does not compromise ocean health. As India continues to develop its coastline and ocean resources, Gujarat's efforts serve as a model for sustainable practices in fisheries and aquaculture. The state's initiatives aim to secure long-term benefits for both the economy and the environment, helping maintain a healthy ecosystem while supporting local communities (NITI Aayog, 2021).

12. Gujarat: A Platform for Progress

“Gujarat has the natural advantage of an extensive coastline and a rich fish production history,” Chief Minister Bhupendra Patel recently declared. “Our state stands tall as a leading fish exporter, contributing 17% to India's total. We are committed to further propelling this sector forward through initiatives like the Sagar Khedu Sarvangi Vikas Yojana, which has been instrumental in the overall development of our fisheries” (GoG, 2023).

13. Challenges in Gujarat's Blue Economy Development

1. Ecological & Environmental Pressures

- **Mangrove loss and coastal erosion:** Industrial expansion and port projects have led to destruction of mangroves and fragile ecosystems.
- **Pollution:** Discharge from industries and ships affects marine biodiversity and fish stocks.

- **Climate change impacts:** Rising sea levels, ocean acidification, and warming waters threaten fisheries and coastal communities.

2. Livelihood Risks for Coastal Communities

- **Displacement of fisherfolk:** Large-scale port and industrial projects often displace traditional fishing villages.
- **Declining fish catch:** Overfishing and habitat loss reduce incomes for small-scale fishers.
- **Limited social protection:** Fisherfolk face inadequate insurance, healthcare, and alternative livelihood support.

3. Infrastructure & Governance Gaps

- **Weak coastal infrastructure:** Inadequate cold storage, fish landing centers, and processing facilities limit value addition.
- **Fragmented governance:** Multiple agencies (ports, fisheries, environment) operate with poor coordination.
- **Limited private sector participation:** Investment in sustainable fisheries and renewable energy remains low.

4. Marine Resource Management

- **Overexploitation:** Shrimp aquaculture and mechanized trawling put pressure on marine ecosystems.
- **Knowledge gaps:** 95% of the ocean remains unexplored, limiting scientific understanding for sustainable planning.
- **Lack of marine spatial planning:** Projects often overlap, causing conflicts between industry, fisheries, and conservation.¹⁸

14. Conclusion:

In conclusion, Gujarat exemplifies a holistic Blue Economy model in India, successfully integrating marine and inland fisheries, coastal infrastructure, port-led industrial development, and sustainable ship recycling to drive economic growth, environmental stewardship, and social welfare. The state's extensive coastline, productive fisheries, and progressive policies—such as the Sagarmala Programme, PM Matsya Sampada Yojana, Maritime India Vision 2030, and Gujarat Port Policy reforms—have strengthened maritime trade, enhanced livelihoods, and promoted sustainable resource utilization. Simultaneously, initiatives like the Alang Ship Recycling Yard transformation demonstrate how industrial activities can adopt circular economy principles, minimize environmental impact, and comply with global safety and sustainability standards. By investing in technological upgrades, modern infrastructure, and scientific resource management, Gujarat has balanced economic development with ecological protection, ensuring that growth in fisheries, aquaculture, ports, and marine industries does not compromise coastal ecosystems or community welfare. Challenges remain, including coastal pollution, overexploitation of resources, and climate change impacts, but Gujarat's integrated approach—linking policy, innovation, and stakeholder participation—provides a replicable model for sustainable Blue Economy development in India and globally. Ultimately, the state's efforts showcase the potential of coastal and marine resources to drive inclusive, resilient, and responsible growth, demonstrating that economic prosperity and environmental sustainability can advance hand in hand.

15. Key Suggestions for Gujarat's Blue Economy

To strengthen Gujarat's Blue Economy, the state should expand sustainable fisheries and aquaculture, improve coastal governance through better coordination and marine spatial planning, and develop ports and maritime industries responsibly while encouraging private investment. Modernizing Alang Ship Recycling Yard, adopting circular economy practices, and training workers will enhance resource efficiency, while ecosystem restoration, climate adaptation, and support for fisherfolk will safeguard livelihoods. Continued investment in ocean research, marine biotechnology, and renewable energy will drive innovation and sustainable growth.

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