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Unprecedented Impact of the COVID-19 Pandemic on Sustainability in the Blue Economy: A Perspective on Indian Policy



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The COVID-19 pandemic significantly disrupted India's Blue Economy, revealing vulnerabilities in marine industries such as fisheries, tourism, transport, and energy, and exacerbating existing coastal challenges. This perspective examines the multifaceted impacts of the pandemic on India's Blue Economy, focusing on economic, ecological, and social dimensions. It suggests an integrated, multi-sectoral governance approach to foster post-pandemic resilience and sustainability. The study recommends adopting inclusive, climate-resilient, and ecosystem-based marine resource management, proposing enhanced cross-sector collaboration, data transparency, strengthened coastal governance, and community participation in future strategies and crisis management.

Main text

The Blue Economy (BE) encompasses the sustainable utilization of ocean resources to provide economic value and employment while protecting marine ecosystems and promoting social welfare¹. Globally, BE contributes approximately 3.5–7% of GDP, generating nearly US\$1.5 trillion annually through sectors such as shipping, tourism, fisheries, aquaculture, and coastal services². More broadly, the commercial value of ocean-based economic activities is estimated to range from US\$3 to US\$6 trillion, driven by services such as marine transport, fisheries, aquaculture, tourism, and coastal urban economies³. Around 90% of global trade is carried by maritime transport, while fisheries and aquaculture provide food for approximately 4.3 billion people, contributing more than 15% of the world's annual animal protein consumption. Additionally, marine tourism accounts for about 5% of global GDP and 6–7% of global employment, and more than 40% of the global population (3.1 billion people) lives within 100 km of the coastline across roughly 150 coastal urban areas⁴.

Despite its significant economic contribution, the Blue Economy faces several challenges, including climate change, overexploitation of resources, habitat degradation, and pollution. These challenges were further intensified when the World Health Organization declared COVID-19 a global pandemic on 11 March 2020⁵. The pandemic triggered unprecedented global lockdowns that disrupted economic activities across multiple sectors, including maritime transport, fisheries, tourism, and coastal industries². Restrictions on mobility, trade, and fishing operations severely affected daily livelihoods and economic activity across coastal regions (Fig. 1). This article

compiles available evidence on the impacts of COVID-19 on the Blue Economy in India and globally, highlighting the urgent need to assess these disruptions and develop strategies to mitigate their long-term consequences. Among Blue Economy sectors, coastal and maritime tourism is one of the most economically significant, contributing approximately 5% of global GDP and supporting 6–7% of global employment⁶. However, the importance of this sector varies across regions, particularly in Small Island Developing States (SIDS), whose economies depend heavily on tourism revenues⁷. During the pandemic, the collapse of global tourism led to severe economic shocks in these regions, with coastal economies experiencing significant GDP losses. In SIDS alone, tourism decline caused an estimated US\$7.4 billion reduction in GDP⁸.

The pandemic also severely disrupted maritime trade and the fishing industry. International shipping carriers reportedly experienced losses of nearly US\$1.9 billion⁹, while hundreds of millions of jobs across ocean-based sectors were affected, particularly in developing countries and vulnerable coastal regions⁸. The fisheries and aquaculture industries faced significant supply chain disruptions, labor shortages, and declining demand from restaurants and hospitality sectors. For example, in the United States, fresh seafood catches declined by about 40%, while seafood imports and exports decreased by 37% and 42%, respectively^{10,11}. Similarly, India's shrimp farming industry experienced an estimated US\$1.5 billion revenue loss, along with a 40% reduction in production^{7,12,13}. While these disruptions initially affected supply chains, later studies revealed complex shifts in consumption patterns, with reduced demand from restaurants but

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Fig. 1 | Fishing operations were impacted during the COVID-19 lockdown at Royapuram Harbor, Chennai. Fishing trawlers and small-scale vessels remained idle during the COVID-19 lockdown at Royapuram fishing harbor, Chennai, due to strict mobility restrictions and public health measures. The abrupt suspension of fishing activities disrupted marine harvests and triggered cascading socio-economic impacts, including loss of daily income among fishers and allied workers, reduced availability of fresh seafood in local markets, and interruptions in supply chains. Ancillary sectors such as fish processing, transportation, and export logistics were also severely affected, exacerbating financial insecurity in coastal communities and highlighting structural vulnerabilities within fisheries-dependent blue economy systems.



increased retail purchases for home consumption¹⁴. This dual demand pattern, combined with logistical constraints, created unprecedented challenges for the fisheries sector.

This bifurcated demand pattern and logistical constraints created unprecedented challenges for the fisheries sector. Asia dominates global aquaculture production, contributing approximately 90% of total output. The leading producers include China (49 MMT), accounting for more than 60% of global aquaculture production, followed by India (5.7 MMT), Indonesia (4.9 MMT), Vietnam (3.6 MMT), and Bangladesh (2.2 MMT)¹⁵. India is a trade-surplus country in fisheries, with exports consistently exceeding imports. In fiscal year 2013–2014, exports were 31.5 times higher than imports, generating a trade surplus of approximately US\$2.32 billion, with exports valued at US\$2.4 billion and imports at US\$76 million⁴. Globally, India ranks among the leading seafood exporters, with shellfish exports valued at US\$3.89 billion and finfish exports at US\$1.16 billion in FY 2015. Prior to the pandemic, global fisheries exports had grown by 11%, increasing from US\$136 billion in 2013 to US\$152 billion in 2017, but the COVID-19 crisis was expected to cause a 33% decline in trade¹⁶.

The pandemic induced cascading declines within the BE ocean-based sectors, including fisheries, aquaculture, coastal tourism, shipbuilding, marine transport, emerging blue technologies, and the marine extraction of oil and natural gas, as illustrated in Fig. 2. In many regions, especially SIDS, fisheries and tourism form the backbone of local economies, generating approximately US\$30 billion annually. However, pandemic-related travel restrictions caused an almost complete collapse of livelihoods dependent on tourism and fisheries. The overall decline in worldwide arrivals is estimated to result in a loss of \$7.4 billion, equivalent to a 7.3% decline in GDP¹⁷. Asia-Pacific and Europe are the most affected so far. The loss of export revenue from tourism is estimated to be between US\$910 billion and US\$1.2 trillion in 2020¹⁸. It is estimated that the travel and tourism sector's contribution to India's GDP was 9.4% (US\$236 billion) and is expected to expand to 9.9% of GDP (US\$463 billion)¹⁹ by 2028.

However, due to COVID-19, its contribution dropped sharply from 7% of GDP (US\$212 billion) in 2019 to 4.3% (US\$124 billion) in 2020, representing a 41.7% decline²⁰. The BE contributed 4.1% of India's GDP^{21,22} and collapsed by 23.9%, i.e., ~0.05% BE, in the first quarter of 2020–2021²³ during the pandemic. Hence, restrictions on trade route closures, fishing, and tourism are impacting the BE of India and other countries. The United Nations General Assembly adopted the 2030 Agenda for Sustainable Development Goals (SDGs). The SDG-14, about "Life Below Water", aims to conserve and sustainably use oceans, seas, and marine resources. This goal is supported by international legal frameworks such as the United

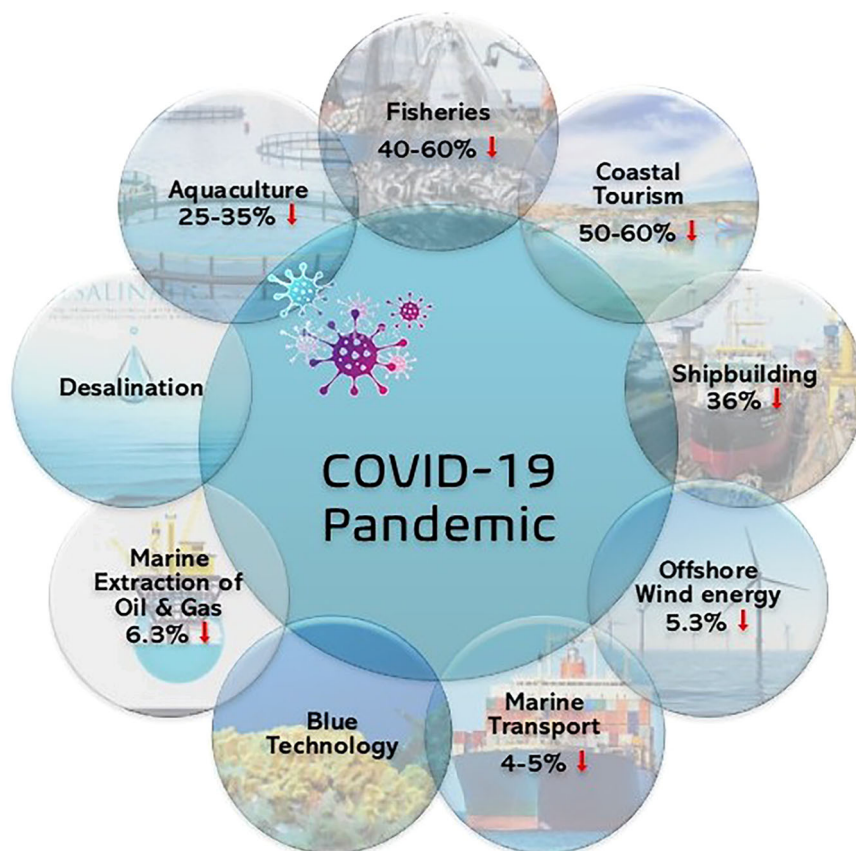
Nations Convention on the Law of the Sea (UNCLOS), which provides the legal foundation for sustainable ocean governance and Blue Economy development²⁴.

The pandemic has intensified the demand for recovery and resilience methods, particularly in key sectors such as tourism and maritime transportation. Improving sanitary compliance, maintaining crew safety, and encouraging alternative livelihoods for small-scale fishers and coastal communities are critical steps toward achieving long-term recovery while aligning with SDG-14 targets. This pandemic has caused most countries to face a global economic recession. The sea is an important territory and a source of BE opportunities, and many low- and middle-income coastal and island nations rely significantly on it for both territory and economic prospects. In these countries, innovation and growth in the coastal, marine fisheries, and tourism sectors can provide food, energy, employment, and transportation as the basis for sustainable development.

Governments need to consider immediate stimulus fund investments to facilitate a sustainable and equitable recovery from the COVID-19 crisis, which could be directed toward, for example, waste treatment, coastal restoration and protection, fisheries, aquaculture, ocean-based renewable energies, and marine transport. In the short term, strategic investment of recovery and stimulus funds in the ocean economy will create an untapped opportunity to promote job creation, economic diversification, and relief. Longer-term social, financial, and ecological resilience will be strengthened by such investments, which will also contribute to the ocean industries and inclusive sustainable growth. The investment guarantees that development aligns with sustainability objectives and minimizes damage to marine habitats by allocating resources to innovation, capacity-building, and ecologically conscious practices⁸. India is committed to developing the blue economy, and numerous initiatives have been launched to promote this sector. The Economic Advisory Council to the Prime Minister (EAC-PM), Government of India (GoI), has established a policy framework for the sustainable usage and management of living, mineral, and energy resources through coastal and marine spatial planning²⁵ and shifting harmful subsidies to more sustainable and equitable uses. The WTO agreement is a significant step in ensuring the sustainability of our ocean. For the first time, it sets binding worldwide standards requiring countries to review the legality and sustainability of their subsidizing of fishing activities. Overfishing significantly threatens ocean biodiversity, primarily driven by harmful subsidies^{26,27}.

Effective ecosystem-based MSP initiatives with strong sustainability objectives are recommended to prioritize the health and resilience of the ocean for the sustainable development of the BE of marine areas and coastal regions of India²⁸. A proposed policy framework for the Blue Economy

Fig. 2 | The pandemic shutdown of marine industries and fisheries caused major losses to the blue economy. Marine resource utilization and fishing activities were significantly disrupted during the COVID-19 pandemic, resulting in substantial losses to the blue economy (as indicated by the downward trend marked by the red arrow). This disruption not only reduced fish production and export revenues but also caused widespread livelihood insecurity among coastal communities dependent on fisheries. Furthermore, the shutdown affected ancillary sectors, including processing, transportation, and marketing, leading to supply chain disruptions and reduced market accessibility. Collectively, these impacts highlighted the economic vulnerability and limited resilience of marine-based industries to large-scale global crises.



emphasizes interconnected theme areas and the significance of developing them concurrently to maintain long-term growth, especially amid large disruptions like the COVID-19 pandemic. It is influenced by spatial and temporal dynamics that shape the distribution, accessibility, and governance of marine resources, ultimately impacting how nations develop and implement their biodiversity (BE) strategies. In the aftermath of the COVID-19 pandemic, analyzing the BE through a spatial-temporal lens offers insight into the evolution of policies, institutional readiness, and developmental disparities across various regions and periods. In both the Indian and global contexts, the governance of the BE is intricately linked to geographical positioning, resource endowments, technological capacities, and the evolving development frameworks over time. Blue Economy development is strongly influenced by spatial and temporal dynamics, which shape the distribution, accessibility, and governance of marine resources. Examining the Blue Economy through a spatial-temporal perspective provides insights into evolving policy frameworks, institutional capacities, and regional disparities. Spatially, Blue Economy governance varies across different geographic contexts, including India's exclusive economic zone (EEZ), coastal states, small island developing states (SIDS), and major maritime economies such as the European Union and China. Temporally, policy priorities have evolved from resource extraction—such as fisheries and offshore mining—toward sustainability-oriented frameworks, particularly after 2010 with the adoption of SDG-14 and initiatives such as the UN Decade of Ocean Science for Sustainable Development (2021–2030).

Despite India's ambitious Blue Economy goals, significant challenges remain, particularly due to implementation gaps and institutional fragmentation following the COVID-19 pandemic. Effective Blue Economy governance requires an integrated approach that accounts for the interaction between spatial factors (ecosystems, jurisdictions, and geographic zones) and temporal dimensions (policy cycles, climate adaptation timelines, and development phases). At the global level, institutions such as the International Seabed Authority (ISA), Regional Fisheries Management

Organizations (RFMOs), and multilateral agreements, including UNCLOS and the 2023 High Seas Treaty, provide regulatory frameworks that guide sustainable ocean governance. While these international frameworks influence India's policy approach, the governance of Blue Economy sectors remains fragmented, with fisheries, shipping, energy, and coastal management operating under different ministries and regulatory bodies.

Framework for the Blue Economy in India

The policy framework emphasizes policies across several major sectors to achieve overall economic growth. The COVID-19 pandemic exposed critical vulnerabilities in existing Blue Economy governance frameworks, highlighting the need for a more integrated and resilient approach²⁹. While various Blue Economy policy frameworks exist³⁰, few specifically address the challenges posed by major system shocks, such as pandemics. Building on these existing frameworks and incorporating lessons from COVID-19, we have developed a comprehensive policy framework organized around seven thematic areas, following the refined framework suggested by policy experts from India's Ministry of Earth Sciences²⁵. Our framework emphasizes cross-sectoral integration, which is essential for establishing systemic resilience to disruptions such as pandemics. We directly integrate insights from COVID-19 to improve adaptive capacity, whereas most current frameworks were developed for stable conditions and have proven inadequate during the crisis. This innovative method provides a more comprehensive and robust framework for Blue Economy development in an increasingly unpredictable environment, facilitating sustainable progress toward a blue recovery compared to existing frameworks.

National accounting framework for Blue Economy and ocean governance

The Blue Economy's size, estimated at about 4.1% of India's GDP, is expected to grow significantly if strengthened through appropriate policy interventions and investment³¹. Conventional techniques for measuring

Blue Economy contributions have focused narrowly on direct economic outputs from traditional sectors, such as fisheries and shipping³². These approaches fail to capture critical dimensions such as ecosystem services, circular-economy activities, and cross-sectoral linkages²⁹. Additionally, the pandemic revealed serious data gaps in tracking real-time changes in the ocean economy during crises³³. To address these shortcomings, we recommend new data collection techniques that integrate environmental-economic accounting standards, high-frequency economic indicators, digital monitoring solutions, and expert input from diverse stakeholders to create a more comprehensive accounting framework for the Blue Economy. Scientific collaboration with key countries is also needed to develop tools for measuring and managing the blue economy. An integrated accounting framework, social equity metrics, investment tracking, and adaptability to changing circumstances are also recommended.

Marine fisheries, aquaculture, fish processing, capacity building & training

The pandemic has led to declining seafood demand, disrupting the fish trade and supply chains. This has affected fishing communities, especially in developing nations. Adaptive management strategies, technology integration, and community engagement are crucial to ensure long-term resilience. Prioritizing ecological sustainability and economic recovery is also essential. Recommendations for fisheries development, management, processing, marketing, and finance include investing in training programs, improving Fisheries Management Information Systems, encouraging modern fish processing units, collaborating with international organizations, and developing climate-resilient infrastructure to withstand extreme weather events and sea-level rise. These measures will contribute to a more resilient blue economy and help the sector recover quickly after the pandemic.

Manufacturing, emerging industries, technology, and services

Lockdowns disrupted trade and technology, while digital adoption accelerated. Services and skill development faced declines in revenue and employment, particularly in the tourism and hospitality sector. Recommendations include collaborating with advanced blue economy expertise, promoting circular economy principles, offering tax incentives for green technologies, encouraging diversification within blue economy sectors, and launching awareness campaigns to highlight the blue economy's importance and its potential for job creation and economic growth. These recommendations aim to drive innovation and entrepreneurship in the blue economy.

Marine spatial planning and coastal tourism

The potential of tourism in coastal and marine economies is examined within the context of coastal marine spatial planning. The coastal marine spatial planning (CMSP) approach, as recommended by the Intergovernmental Oceanographic Commission, is vital for integrating various sectors of the Blue Economy, local communities, private stakeholders, and the government³⁴. It is essential to adhere to the principle of carrying capacity when developing coastal tourist destinations and marine activities. The economy should be connected to the CMSP under a national-level authority³⁵. Recommendations include Integrated Coastal Zone Management, Climate Resilience, and Disaster Preparedness; designing accessible infrastructure; establishing a monitoring system; and providing specialized training to tour operators, guides, hospitality staff, and local communities.

Logistics, infrastructure, transportation and transshipment

The need for resilience and sustainable strategies is highlighted, with recommendations for enhancing connectivity, utilizing digital platforms for real-time cargo tracking, integrating innovative technologies, developing integrated logistics parks, improving cargo transfer efficiency, advancing modern logistics operations, encouraging private sector participation, and collaborating with international organizations to learn from best practices and leverage global expertise in logistics and transportation management. These actions can help

countries navigate recovery and build a more resilient and sustainable blue economy.

Coastal and deep-sea mining and offshore energy

The coastal and deep-sea mining, as well as offshore energy, industries have been struggling with workforce management due to travel restrictions and safety concerns, which are affecting productivity and project timelines. Countries worldwide are implementing recovery and sustainability strategies to revitalize these sectors, emphasizing sustainable practices, renewable energy sources, and digitalization³⁵. The pandemic's effects on these sectors may vary depending on regional restrictions, industry-specific regulations, and global demand. Recommendations include implementing ecosystem-based management approaches, involving decision-making processes, developing equitable benefit-sharing mechanisms, introducing advanced technologies, establishing guidelines for ecosystem restoration, generating specialized training programs, implementing long-term monitoring programs, and establishing dialog platforms to raise public awareness about the benefits and risks of these industries.

Security, strategic aspects, and international efforts

The pandemic has exacerbated maritime security issues, including increased piracy and armed robbery incidents. This has led to gaps in monitoring illegal activities and human trafficking. The pandemic has underscored the importance of collective resilience and strategic planning in the blue economy. Countries can build a more secure blue economy by prioritizing international cooperation, investing in maritime domain awareness, and addressing strategic concerns through diplomatic channels. To improve security, countries should develop a comprehensive national maritime strategy, advance maritime security technologies, enhance maritime domain awareness, collaborate with private-sector organizations, strengthen cooperation agreements, encourage public diplomacy campaigns, and develop strategic partnerships with major maritime powers.

Impact of COVID-19 on Blue Economy and GDP in India and South Asian Countries

The Blue Economy (BE) integrates economic growth, social inclusion, and environmental sustainability through the responsible use of ocean resources. Globally, it supports livelihoods, food security, trade, and tourism while advancing SDG-14 on ocean conservation. In South Asia, countries bordering the Indian Ocean—India, Bangladesh, Sri Lanka, Maldives, Pakistan, and Indonesia—recognize the BE's potential for sustainable development, regional integration, and resilience to economic shocks. India has advanced a multifaceted BE strategy encompassing fisheries, tourism, shipping, deep-sea mining, and biotechnology. Key measures include: the SAGAR Initiative (regional maritime cooperation), the Deep Ocean Mission (research and technological development), creation of marine clusters and economic zones, port-led industrialization, and diversification of fishery exports. Bangladesh prioritizes offshore fisheries, deep-sea trawling, maritime transport, shipbuilding, and climate-resilient marine infrastructure, and is developing a Marine Spatial Planning (MSP) framework and regional research collaborations. With major investments in ports and cruise programs, Sri Lanka focuses on sustainable fisheries, marine tourism, and port development. Challenges persist from overfishing, environmental degradation, and risks posed by externally financed infrastructure. The Maldives emphasizes marine tourism and tuna fisheries, supported by Marine Protected Areas (MPAs) and coral reef conservation. International partnerships and blue financing mechanisms, including potential Blue Bonds, reinforce sustainability and livelihoods. Pakistan has limited BE integration, with no formal policy; Vision 2025 incorporates some maritime development elements, but fisheries, transport, and tourism remain poorly coordinated. Nepal and Bhutan, though landlocked, engage indirectly through transboundary water management, inland aquaculture, and participation in regional forums like BIMSTEC and SAARC. GDP for various countries has increased from the COVID-19 period to the present (Table 1)^{36–39}. Globally, frameworks led by UNDP, FAO, and the World Bank emphasize

Table 1 | Covid-19 impact on Blue Economy & the status of GDP in India and South Asian Countries

Sl no	Country	BE value (USD, 2024)	% of national GDP	Major sectors	Covid-19 impact	Sources
01	India	~\$140 billion	~4%	Ports, shipping, fisheries, offshore wind, tourism	Coastal tourism collapsed; port/logistics resilient; fishery exports dipped	ICSF (2023); ; World Bank (2021)
02	Bangladesh	~\$6 billion	~1.3%	Shipbuilding, fisheries, coastal tourism, and ports	Supply chain disruptions in shipbuilding and artisanal fisheries severely hit	World Bank (2021); Atlantic Council (2022)
03	Sri Lanka	~\$7.5 billion	~2.5%	Fisheries, tourism, maritime transport	Cruise/tourism revenue was nearly zero in 2020–21; recovery is slow	World Bank (2021); Atlantic Council (2022)
04	Pakistan	~\$3.5 billion	~0.9%	Fishing, Gwadar Port, marine transport	Small-scale fishing impacted; port activity rebounded faster	World Bank (2021); Atlantic Council (2022)
05	Maldives	~\$1.5 billion	~50%+	Marine tourism, diving, and fisheries	Tourism collapsed (>70% GDP affected); slow but steady rebound post-2021	World Economic Forum (2020); Atlantic Council (2022)
06	Indonesia	~\$280 billion	~11–13%	Fisheries, aquaculture, marine tourism, oil/gas	Fishery exports dipped; tourism hit in Bali & coastal regions	World Bank (2021); Atlantic Council (2022)
07	Bhutan	~\$3.42 billion		Approximately 10.3% from tourism	Hydropower, tourism, and fisheries	World Bank (2021); Atlantic Council (2022)

Table 2 | COVID-19 impact on key Blue Economy sectors in India

Sl No.	Sector	Indicator (2019 → 2020)	% Change (India)	Source/notes
01	Tourism	Domestic & international tourist arrivals	–50% to –60% (domestic slightly less; international heavily down)	Ministry of Tourism, India (2020–2021)
		Tourism receipts (coastal & marine)	–55% approx.	Ministry of Tourism, India
02	Fisheries	Small-scale fishers' income	–40% to –60% (varies regionally; e.g., Kerala, Tamil Nadu worst affected)	CMFRI, 2020; FAO India briefs
		Seafood export demand	–25% approx. (shrimp, tuna, etc., most affected)	Marine Products Export Development Authority (MPEDA)
03	Aquaculture	Hatchery/seed supply	–25% to –35% (shrimp & freshwater seed)	FAO Asia-Pacific/Industry report
		Processing plant output	–20% to –30%	MPEDA, Industry reports
04	Shipping / Ports	Maritime trade volume	–4% to –5%	Indian Ports Association, 2020
		Container throughput in major ports	–8% to –10%	IPA Annual Report
05	Conservation	Enforcement patrols in MPAs	–40% to –50% in some regions	WWF India / State Forest Departments
		Research expeditions	Mostly halted for 3–6 months	CSIR-NIO, ICAR reports

ecosystem-based management, sustainable fisheries and aquaculture, climate-resilient coastal infrastructure, public–private partnerships, and data-driven governance, offering models for regional adaptation.

In India, COVID-19 caused significant disruptions across key Blue Economy sectors during 2020. Tourism was severely affected, with domestic and international arrivals declining by 50–60% and coastal tourism receipts dropping by around 55%. Small-scale fishers experienced income losses of 40–60%, while seafood exports, particularly shrimp and tuna, fell by approximately 25%. Aquaculture also suffered, with hatchery and seed supply reducing by 25–35% and processing plant output declining 20–30%. Shipping and port operations were moderately impacted, with maritime trade volume decreasing 4–5% and container throughput falling 8–10% at major ports. Conservation efforts were disrupted, with enforcement patrols in Marine Protected Areas dropping 40–50% in some regions and research expeditions essentially halted for several months (Table 2)^{40–43}. Overall, the pandemic highlighted the vulnerability of India's Blue Economy sectors, especially fisheries, aquaculture, and tourism, while also affecting conservation and maritime operations.

Roadmap for a sustainable and equitable Blue recovery

The roadmaps for sustainable and equitable blue recovery aim to address economic and social challenges while prioritizing sustainability, resilience, and inclusivity in the blue economy. Key components include promoting

sustainable ocean industries, creating jobs and livelihoods, promoting sustainable fisheries and conservation measures, combating illegal fishing, and establishing marine protected areas. Inclusive governance and stakeholder engagement are promoted, involving local communities, indigenous groups, and women in decision-making. The roadmap emphasizes creating blue jobs, supporting coastal communities' livelihoods, investing in blue skills training, building capacity, and empowering local communities. A comprehensive approach is necessary to restore and enhance the blue economy following the COVID-19 pandemic. Initiatives include implementing financial relief measures, skill development programs, resource utilization, environmentally friendly technologies, engaging local coastal communities, promoting gender equity, strengthening international collaborations, and developing integrated policies that prioritize sustainable development and adaptive management.

Conclusion

The investigation explores the status of blue economies, challenges faced in post-pandemic scenarios, and emerging solutions. The ocean economy is crucial for a sustainable future, providing economic and social benefits and resilience. Recovery and stimulus packages can invest in policy reforms to enhance the blue economy's contribution to GDP, improve the livelihoods of coastal communities, conserve marine biodiversity, and maintain marine resource security. Effective governance promotes the sustainable

management of aquatic resources and ecosystems, thereby enhancing the contribution of fisheries, aquaculture, and mariculture to the macro-economy. The pandemic severely affected the blue economy globally, especially in Small Island Developing States (SIDS) and developing countries. Therefore, the functioning of blue economy sectors must continue and must be adapted to COVID-19 pandemic resilience measures. In particular, safety and security measures must be rigorously maintained across all sectors, including sub-sectors of the blue economy, to achieve a sustainable blue economy.

Limitation of the study

Extensive economic research is beyond the scope of this article. Our main task was to pay special attention to the Blue Economy's complex approach to the COVID-19 pandemic. It is hoped that experts in other disciplines (economics, environmental sciences, production optimization, etc.) will conduct in-depth research on the proposed approach on a global scale.

Data availability

No datasets were generated or analyzed during the current study.

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Author contributions

Subrat Naik (SN): Literature review, data analysis, and writing—original draft, Rajani Kanta Mishra (RKM): Final draft and supervision. Uma Sankar Panda (USP): Review literature and interpretation, Pravakar Mishra (PM):

Review the manuscript, M.V. Ramana Murthy (MVR): Project administration, Federico Baltar (FB): Review the paper, Shailesh Nayak (SN): Review and suggestion. It confirms that all authors have read and approved the paper.

Competing interests

The authors declare no competing interests.

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