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| RESEARCH ARTICLE

The Untapped Blue Economy of Bangladesh: Prospects, Economic Valuation, Barriers and Policy Pathways for Sustainable Growth in the Bay of Bengal

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| ABSTRACT

Bangladesh gained rights over 118,813 km² of the Bay of Bengal through the maritime rulings of 2012 and 2014, but its blue economy remains largely untapped. This study updates the World Bank's FY2014–15 ocean economy accounts using sector activity indicators, projects three pathways to 2041, values selected blue natural capital, and links the gaps to barriers and policy options. The ocean economy is estimated at about US$11.2 billion of gross value added in 2025 (range 9.2–14.4), or 2.5% of GDP, down from 3.3% in FY2014–15. Ports and coastal tourism grew strongly, while marine fish production fell and offshore energy declined after a licensing round drew no bids. By 2041, the ocean economy reaches US$20.6 billion under business as usual and US$30.8 billion under sustainable blue growth. The untapped value is therefore about US$10.2 billion a year, or US$41 billion in present value, and a degradation pathway would forgo a further US$4.8 billion a year. More than half of the untapped value lies in tourism and fisheries. The carbon stored in the Sundarbans, 205–334 $MtCO_2$, is worth US$39–63 billion at the social cost of carbon but only US$1.3–8.3 billion at market prices. Weak data, fragmented institutions and scarce long-term finance are the binding barriers. A three-phase pathway is proposed. It starts with foundations to 2028: updated accounts, a research vessel, a statutory authority and a marine spatial plan. Investment follows to 2033 through a blue bond, blue carbon projects, the deep-sea port and mariculture, and scale within ecological limits comes by 2041.

| KEYWORDS

Blue economy; ocean economy accounts; natural capital; blue carbon; marine spatial planning; Bay of Bengal; Bangladesh.

| ARTICLE INFORMATION

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1. Introduction

The ocean has become an economic frontier. The OECD estimated that ocean-based industries generated about US$1.5 trillion of gross value added in 2010 and projected that this could double by 2030 (OECD, 2016). For coastal developing countries, the idea of a blue economy promises growth that does not have to compete with farmland or forests: fish and seaweed from the sea, trade through ports, energy from offshore gas and wind, and income from coastal tourism. It also comes with a warning. The ecosystems that sustain these activities, from fish stocks to mangroves, can be run down faster than the economy built on them grows (World Bank and UN DESA, 2017).

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Few countries were handed a larger opportunity in a shorter time than Bangladesh. Two rulings, by the International Tribunal for the Law of the Sea on the boundary with Myanmar in 2012 and by an arbitral tribunal on the boundary with India in 2014, confirmed Bangladesh's rights over 118,813 km² of the Bay of Bengal, an area equal to about four-fifths of its land territory (The Daily Star, 2019). The government made the blue economy a development priority soon afterwards. The World Bank's first ocean economy accounts valued the sector at US$6.2 billion of gross value added in FY2014–15, or 3.3% of the national total. Tourism and recreation contributed a quarter of this, marine fisheries and aquaculture 22%, transport 22% and offshore energy 19% (Patil et al., 2018).

A decade later, the promise has run ahead of delivery. Marine fish production fell from 0.71 million tonnes in FY2021–22 to 0.63 million tonnes in FY2023–24, while inland aquaculture continued to grow (DoF, 2025). The 2025 ecosystem survey by the research vessel Dr Fridtjof Nansen found an overall decline in marine fish stocks, which the government attributed to overfishing and harmful nets (The Business Standard, 2025). An offshore oil and gas licensing round launched in 2024 attracted no bids, even as domestic gas output fell to about 1,620 million cubic feet a day against demand of about 4,000 (UNB, 2026). The Blue Economy Cell created in 2017 was reported to have made little progress within four years (UNB, 2021), and the government was still considering an institutional framework for the sector in 2026 (Daily Observer, 2026). As the Chief Adviser remarked in January 2026, the country's maritime area is comparable in size to its landmass, yet basic data on its resources are lacking (The Financial Express, 2026a).

The picture is not one of stagnation everywhere. Chattogram port handled a record 3.41 million TEU of containers in 2025, up from 2.01 million in 2015 (World Cargo News, 2016; The Daily Star, 2026a). Bangladesh remains one of the world's three largest ship-recycling nations, with 23 yards certified or provisionally certified under the Hong Kong Convention, which entered into force in June 2025 (The Financial Express, 2026b). Its mangroves cover about 441,000 ha (ULAB CSD, 2025), and the Sundarbans alone stores an estimated 56–91 Tg of carbon (Hilmi et al., 2025). The blue economy of Bangladesh is therefore not small. Much of its value, however, is unmeasured, and much of its potential remains untapped.

The literature has not resolved this tension. Sarker et al. (2018) mapped the opportunities sector by sector, and the World Bank's accounts remain the only national estimate of the ocean economy (Patil et al., 2018). Other studies examine single sectors or sites, such as fisheries, ports, ship recycling or a particular coral island. No study has combined an updated account of the market ocean economy with the value of the natural capital beneath it, projected what alternative pathways would be worth, and linked the gap to specific barriers and policies. This paper addresses four questions:

1. How large is Bangladesh's ocean economy today, and how has its structure changed since the FY2014–15 baseline?
2. What is the economic value of its untapped potential to 2041 under alternative development pathways, and what is its blue natural capital worth?
3. What barriers prevent this potential from being realised?
4. Which policy pathways could unlock the potential while protecting the ecosystems on which it depends?

The paper makes three contributions. It provides an updated, source-referenced profile of the main blue economy sectors as of 2026. It values the untapped potential through transparent scenarios to 2041, the horizon of the national Perspective Plan, alongside an estimate of the value of mangrove and other blue carbon ecosystems. And it translates the results into a sequenced policy pathway. Section 2 reviews the literature and sets out the framework. Section 3 describes the maritime domain and today's ocean economy, and Section 4 explains the data and methods. Sections 5 and 6 present sectoral prospects and natural capital values. Section 7 examines the barriers and Section 8 the policy pathways. Section 9 discusses the findings, and Section 10 concludes.

Highlights

- Bangladesh's ocean economy fell from 3.3% to about 2.5% of GDP between 2015 and 2025
- Sustainable blue growth could add about US$10 billion a year by 2041
- Tourism and fisheries hold more than half of the untapped value
- Sundarbans carbon is worth US$39–63 billion at the social cost of carbon

Data, institutions and finance are the binding barriers to blue growth

2. Literature review and conceptual framework

2.1 What the blue economy means

The term "blue economy" entered international policy around the 2012 Rio+20 conference and has since carried several meanings. Silver et al. (2015) identified four competing discourses: oceans as natural capital, as good business, as integral to the livelihoods of small island states, and as a source of small-scale fishers' livelihoods. Voyer et al. (2018) found that governments, industry and conservation groups use the same term for agendas that range from rapid industrial expansion to strict conservation. The definition most used in development policy describes the blue economy as the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, while preserving the health of ocean ecosystems (World Bank and UN DESA, 2017).

The pace of ocean use makes the distinction important. Jouffray et al. (2020) describe a "blue acceleration" since about 2000, in which claims on ocean food, materials and space have grown faster than at any time in history. Bennett et al. (2019, 2021) warn that blue growth can bring ten kinds of social harm, among them dispossession, pollution, the loss of small-scale fishers' livelihoods, the marginalisation of women and exclusion from decision-making. A sustainable blue economy is therefore defined as much by who benefits and what is conserved as by how much value is produced.

2.2 Measuring the ocean economy

Ocean economy accounts estimate the value added by industries that depend on the sea or take place in it, such as fishing, shipping, offshore energy and coastal tourism. Colgan (2013) set out the approach for the United States, and the OECD (2016) applied it globally. Its projection that ocean industries could double their value added between 2010 and 2030 shaped many national strategies. Developing countries rarely have such accounts. Bangladesh's only national estimate comes from the World Bank, which combined national accounts with sector surveys to value the ocean economy in FY2014–15 (Patil et al., 2018). The accounts measure market output only. They omit the services that ecosystems provide outside markets, such as storm protection, nursery habitat for fish and carbon storage, so a country can appear to grow its blue economy while running down the assets beneath it.

2.3 Valuing blue natural capital

Environmental economics offers tools to value those assets. Costanza et al. (2014) estimated the global value of ecosystem services at about US$125 trillion a year in 2011 and attributed annual losses of US$4.3–20.2 trillion to land-use change since 1997, with coastal wetlands among the most valuable biomes per hectare. Barbier (2017) reviews the marine services most relevant to coastal economies: fisheries support, coastal protection, water purification, recreation and carbon sequestration. Vegetated coastal ecosystems have drawn particular attention as stores of "blue carbon". Indo-Pacific mangroves hold on average about 1,023 Mg of carbon per hectare, mostly in their soils (Donato et al., 2011), and Pendleton et al. (2012) estimated that their conversion and degradation worldwide release 0.15–1.02 Pg of CO_2 a year.

Site studies in Bangladesh give a sense of scale. The provisioning services of the Sundarbans Reserve Forest, including fish, shrimp, fuelwood and honey, are worth about US$145 million a year (Nobi et al., 2025). Per hectare, capture fisheries supported by coastal mangroves are worth about US$976 a year, far more than fuelwood or honey (Rahman et al., 2018). The ecosystem services of Saint Martin's Island, the country's only coral-bearing island, are worth about US$33.6 million a year (Rani et al., 2020).

2.4 Studies of Bangladesh's blue economy

Research on Bangladesh's blue economy has grown since the boundary rulings but remains fragmented. Sarker et al. (2018) reviewed the scientific basis for each sector and called for better stock assessments and marine research. Alam and Xiangmin (2019) found the legal framework for preventing marine pollution incomplete. Shampa et al. (2023) reviewed coastal zone management and highlighted climate exposure: 19 coastal districts, 710 km of coastline and more than 43 million people. Islam et al. (2020) showed how coastal ecosystem services and blue growth interact in the south-east, where the gains from new investment are often unevenly shared. Policy commentary has repeatedly identified weak institutions, scarce data and slow implementation as the binding constraints (UNB, 2021; Daily Observer, 2026). Taken together, these studies describe the opportunities and the obstacles. What is missing is a quantified estimate of how much value is being left untapped and what a different pathway would be worth.

2.5 Conceptual framework

We link these strands in a three-layer framework. The first layer is blue natural capital: fish stocks, mangroves, seagrass, coral, mudflats and the seabed. It produces the second layer, ecosystem service flows, some of which are sold (fish, salt, tourism experiences) and many of which are not (storm protection, nursery habitat, carbon storage). The third layer is the market ocean economy measured in the national accounts: fisheries, shipping and ports, energy, tourism, shipbuilding and recycling. How much natural capital is converted into market value, and whether conversion preserves or depletes the stock, depends on enabling conditions: governance, data, finance, technology and infrastructure.

Within this framework, untapped value is the difference between the value that a sustainable pathway would deliver and the value expected under current trends. It has two parts. The first is market value that is foregone because enabling conditions are missing, such as deep-sea fish that cannot be caught legally or sustainably without a research and licensing system. The second is natural capital value that is lost because ecosystems are degraded, such as carbon released from cleared mangroves. Sections 5 and 6 measure each part, and Sections 7 and 8 examine the enabling conditions.

3. Bangladesh's maritime domain and today's ocean economy

3.1 The maritime domain

Bangladesh's sea area is large relative to its land. The 2012 and 2014 rulings settled its rights over 118,813 km² of the Bay of Bengal, including a 12-nautical-mile territorial sea and a 200-nautical-mile exclusive economic zone, and the government claims a continental shelf extending to 354 nautical miles (The Business Standard, 2022). The coastal zone covers 19 districts, about 47,200 km² or 32% of the country, with a 710 km coastline and more than 43 million residents (Shampa et al., 2023). Four marine protected areas totalling 7,367 km², about 8.8% of the exclusive economic zone, were declared by 2022 (United Nations, 2022). Mangroves cover about 441,000 ha (ULAB CSD, 2025), most of it in the Sundarbans.

Much of this domain lies beyond the reach of the national fleet. In 2019 the fisheries ministry reported that mechanised boats and industrial trawlers fished within about 70 km of the shore, out of some 660 km of sea, and that the country had yet to fish beyond a depth of about 100 m (The Daily Star, 2019). Table 1 summarises the key features.

Table 1. Bangladesh's maritime and coastal domain

Feature	Value	Source
Maritime area under national jurisdiction	118,813 km²	The Business Standard (2022)
Continental shelf claim	Up to 354 nautical miles	The Business Standard (2022)
Coastline	710 km	Shampa et al. (2023)
Coastal zone	19 districts; about 47,200 km² (32% of the country)	Shampa et al. (2023)
Coastal population	More than 43 million	Shampa et al. (2023)
Marine protected areas	Four MPAs, 7,367 km² (about 8.8% of the EEZ)	United Nations (2022)
Mangrove area	About 441,000 ha	ULAB CSD (2025)
Sundarbans carbon stock	56–91 Tg C	Hilmi et al. (2025)

3.2 The ocean economy today

The World Bank's accounts remain the only official-grade estimate of the ocean economy. They put its gross value added at US$6.2 billion in FY2014–15, or 3.3% of the national total (Patil et al., 2018). No update has been published since. Table 2 therefore assembles activity indicators for each sector to show how the economy has moved.

Table 2. Activity indicators for Bangladesh's ocean economy sectors

Sector	Indicator	Earlier value	Latest value	Source
Transport and ports	Chattogram container throughput	2.01 million TEU (2015)	3.41 million TEU (2025)	World Cargo News (2016); The Daily Star (2026a)
Transport and ports	Chattogram share of national trade	–	About 92% of trade, 98% of containers (2025)	The Daily Star (2026a)
Marine fisheries	Marine fish production	0.69 million t (FY2017–18)	0.63 million t (FY2023–24)	The Daily Star (2019); DoF (2025)
Marine fisheries	Fishing fleet	–	237 industrial trawlers and about 28,600 artisanal boats (FY2023–24)	IOTC (2025)
Marine fisheries	Tuna and tuna-like catch	–	About 14,500 t (FY2023–24)	IOTC (2025)
Offshore energy	Domestic gas output	Nearly 2,800 MMCFD (peak)	About 1,620 MMCFD (2026); no bids in the 2024 offshore round	UNB (2026)
Tourism	Visits to Cox's Bazar	About 1.5 million (2015)	6–7 million (2023)	Bhuiyan et al. (2020); The Business Standard (2023a)
Ship recycling	Ships imported for recycling	130 (2024)	88 ships, 2.68 million t (2025); 23 yards certified or provisionally certified	The Financial Express (2026b)
Salt	Production	Record season (2024–25)	1.94 million t against a target of 2.71 million t (2025–26)	Bonik Barta (2026)
Seaweed	Farming households	–	About 1,000 households in Cox's Bazar (2026)	The Daily Star (2026b)

The indicators tell a story of divergence. Port traffic grew by about 70% in a decade, and coastal tourism expanded several-fold as new roads, bridges and a railway reached the coast. Marine fish production, by contrast, has fallen below its level of the late 2010s, the gas industry has declined and offshore exploration has stalled, and ship

recycling has lost ground to India. Seaweed farming, often cited as a frontier industry, still involves only about a thousand households. Figure 1 converts these trends into an indicative estimate of gross value added.

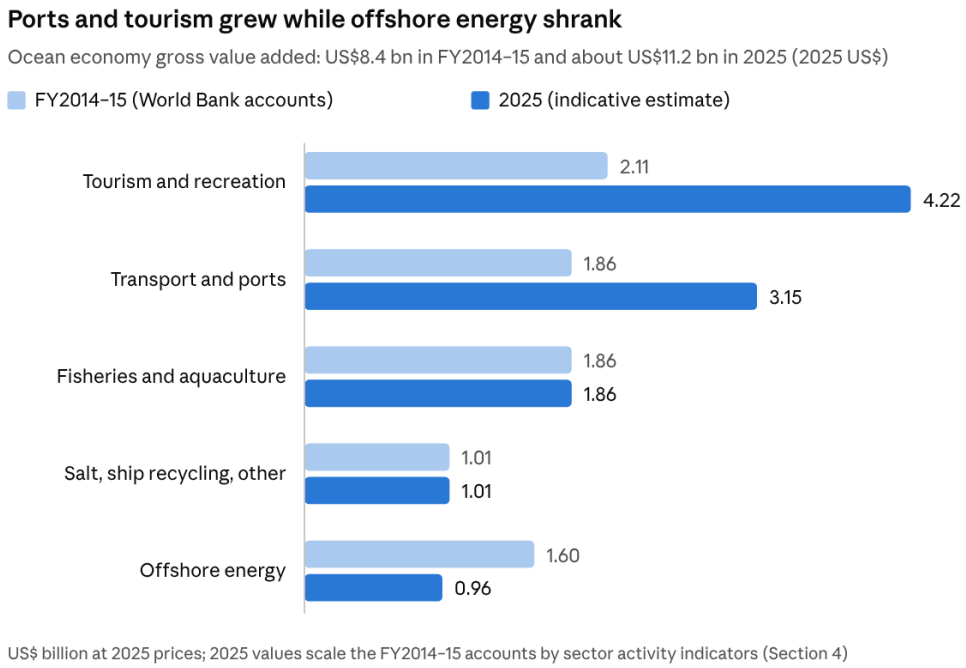


Figure 1. Ocean economy gross value added by sector, FY2014–15 and 2025. FY2014–15 from Patil et al. (2018), converted to 2025 prices; 2025 is the author's indicative estimate (Section 4.2).

On our central estimate, the ocean economy produced about US$11.2 billion of gross value added in 2025, within a range of US$9.2–14.4 billion. That is 2.5% of GDP (range 2.0–3.2%), down from 3.3% in FY2014–15. The ocean economy has grown in absolute terms, but more slowly than the rest of the economy. Tourism and transport now account for about two-thirds of it. The sectors that depend most directly on the sea's natural resources, fisheries and offshore energy, have stagnated or shrunk.

4. Data and methods

4.1 Research design and sources

The study uses a secondary-data design that combines document analysis with a transparent scenario model. Four kinds of source were used: official statistics and plans (the Department of Fisheries, the Chittagong Port Authority, the Bangladesh Bureau of Statistics as reported in the press, Petrobangla and national policy documents); reports of international organisations (the World Bank, OECD, IOTC and United Nations); peer-reviewed studies; and national newspapers for events between 2024 and October 2026 that are not yet covered elsewhere. Where sources disagreed, the official or peer-reviewed figure was preferred and the disagreement is noted. All money values are in US dollars at 2025 prices unless stated otherwise.

4.2 Updating the ocean economy accounts

Because no official update of the FY2014–15 accounts exists, each sector's value added was scaled by an index of its real activity since then:

(1) $V(s, 2025) = V(s, 2015) \times I(s) \times P$

Here $V(s, 2015)$ is the sector's value added in FY2014–15 from Patil et al. (2018), $I(s)$ is the change in its real activity between 2015 and 2025, and $P = 1.36$ converts 2015 prices to 2025 prices using the change in US consumer prices. The activity indices, with low and high values used for sensitivity, are set out in Table 3. They rest on the indicators in Table 2. For tourism, the index is deliberately set at half the growth in visits to Cox's Bazar, because visitor counts

are estimates and spending per visit is unknown. The result is expressed as a share of GDP using the FY2024–25 GDP of US$456 billion (The Financial Express, 2026c).

4.3 Scenarios to 2041

The value of each sector in 2041, the horizon of the national Perspective Plan, is projected under three scenarios:

(2) $V(s, 2041) = V(s, 2025) \times (1 + g(s, k))^{16}$

where g(s, k) is the real annual growth rate of sector s in scenario k. The Degradation scenario assumes continued overfishing, coral and mangrove loss, crowding at coastal destinations and no new offshore gas. Business as usual extends the trends of 2015–2025. Sustainable blue growth assumes that the barriers identified in Section 7 are addressed: fish stocks are rebuilt and deep-sea and mariculture value chains develop, offshore gas exploration succeeds and offshore wind arrives in the 2030s, the Matarbari deep-sea port operates at scale, coastal tourism is managed within carrying capacity, and green ship recycling, shipbuilding and seaweed processing expand. The growth rates in Table 3 are judgements anchored in observed trends. They are not forecasts.

Table 3. Activity indices for 2015–2025 and growth rates for 2025–2041, by sector and scenario

Sector	Activity index 2015–2025: central (low–high)	Basis	Growth: Degradation	Growth: Business as usual	Growth: Sustainable blue growth
Tourism and recreation	2.0 (1.5–3.0)	Visits to Cox's Bazar up roughly fourfold	3%	5%	7%
Marine fisheries and aquaculture	1.0 (0.9–1.1)	Marine catch below its FY2017–18 level	−2%	0%	5%
Transport and ports	1.70 (1.5–1.9)	Container throughput up 70%	4%	5.5%	7%
Offshore energy	0.6 (0.5–0.8)	Gas output down about 42% from its peak	−3%	−2%	6%
Salt, ship recycling and other	1.0 (0.8–1.2)	Mixed: salt record, recycling decline	1%	2%	6%

Two summary measures follow. Untapped value is the difference between Sustainable blue growth and Business as usual. Value at risk is the difference between Business as usual and Degradation. Both are reported for 2041, cumulatively for 2026–2041 and as present values discounted at 5%. GDP is assumed to grow by 5% a year in real terms, with 4% and 6% as sensitivities.

4.4 Valuing blue natural capital

The ocean economy accounts exclude non-market services, so the value of blue natural capital is estimated separately and is not added to gross value added. Three components are measured. The first is the carbon stock of the Sundarbans, 56–91 Tg C (Hilmi et al., 2025), equivalent to 205–334 $MtCO_2$. The second is the annual sequestration of Bangladesh's mangroves, which ranges from 2.0 $MtCO_2$ a year (ULAB CSD, 2025) to 7.6 $MtCO_2$ a year if the lower sequestration rate of Hilmi et al. (2025), 4.7 Mg C per hectare, is applied to the national mangrove area. Both are valued at the social cost of carbon of US$120, 190 and 340 per tCO_2 for emissions in 2020 at discount rates of 2.5%, 2.0% and 1.5% (US EPA, 2023), and at market prices of US$6.34–25 per tCO_2, from the 2024 voluntary-market average (Ecosystem Marketplace, 2025) to an upper value for high-quality mangrove credits. The third component is the provisioning and site values reported for Bangladesh: US$145 million a year for the Sundarbans (Nobi et al., 2025) and US$33.6 million a year for Saint Martin's Island (Rani et al., 2020).

4.5 Barrier and policy analysis

Barriers were identified by coding the reviewed literature, policy documents and press reports into six categories: knowledge and data, governance and institutions, finance and investment, technology and infrastructure, environment and climate, and equity and livelihoods. Each barrier was linked to the sectors it affects and to the evidence behind it. The policy pathway in Section 8 was developed by matching each barrier to responses that have worked elsewhere, adapted to Bangladesh's institutions, and sequencing them over the period to 2041.

4.6 Limitations of the method

The updated accounts are indicative. They assume that value added in each sector moves with a single activity indicator, which ignores changes in prices, productivity and the composition of output. The scenario growth rates are informed judgements. Natural capital values rely on a small number of site studies and on carbon prices that are themselves uncertain. The results should therefore be read as orders of magnitude that show where value lies and how large the gaps are, not as precise forecasts. An official update of the ocean economy accounts would be the single most useful improvement.

5. Sectoral prospects and economic value

5.1 The value of the untapped potential

Under Business as usual, the ocean economy grows from about US$11.2 billion in 2025 to US$20.6 billion in 2041 (Table 4). Under Sustainable blue growth it reaches US$30.8 billion. Under Degradation it reaches only US$15.8 billion, because fisheries decline and tourism suffers from damaged coasts. The untapped value, the difference between the sustainable and current-trend pathways, is about US$10.2 billion a year by 2041, US$71 billion over 2026–2041, or US$41 billion in present value. The value at risk, the difference between current trends and degradation, is US$4.8 billion a year by 2041 and US$20 billion in present value.

Table 4. Ocean economy value added by scenario, 2041 (US$ billion at 2025 prices)

Indicator	Degradation	Business as usual	Sustainable blue growth
Value added in 2041	15.8	20.6	30.8
Share of GDP in 2041, central (range for GDP growth of 4–6%)	1.6% (1.4–1.8%)	2.1% (1.8–2.4%)	3.1% (2.7–3.6%)
Cumulative value added, 2026–2041	214	249	320
Present value at 5%, 2026–2041	142	162	203

Note: The 2025 starting value is US$11.2 billion (range 9.2–14.4). Untapped value in 2041 ranges from US$5.9 billion to US$15.2 billion if growth under Sustainable blue growth is one percentage point lower or higher, and from US$8.5 billion to US$13.1 billion across the low and high 2025 starting values.

Two results stand out. First, even the sustainable pathway lifts the ocean economy only to about 3% of GDP by 2041, roughly its share in FY2014–15. Targets of 9–10% of GDP that have been mentioned in public debate (The Business Standard, 2022) are not attainable on any plausible pathway. Second, the untapped value is spread across sectors rather than concentrated in a single frontier industry (Figure 2). Tourism and fisheries together account for just over half of it.

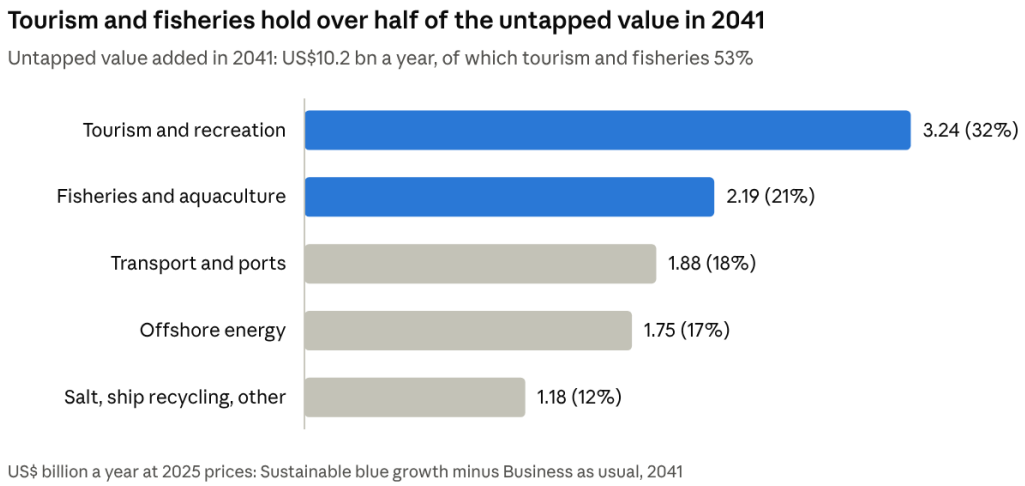


Figure 2. Untapped value added by sector in 2041: the difference between the Sustainable blue growth and Business as usual scenarios. Author's model.

5.2 Fisheries, mariculture and seaweed

Fisheries are the clearest case of value lost to weak management. Marine production accounts for only 12.5% of national fish output, which is now dominated by inland aquaculture (DoF, 2025). The marine catch comes mostly from about 28,600 artisanal boats and 237 industrial trawlers working the shallow shelf (IOTC, 2025). The 2025 ecosystem survey found an overall decline in stocks and recorded oxygen-deficient waters, high microplastic concentrations and unusual jellyfish blooms (The Business Standard, 2025). The same survey identified significant tuna potential in deep waters (The Financial Express, 2026a), yet the reported tuna catch was only about 14,500 t in FY2023–24 (IOTC, 2025). Under Sustainable blue growth, value comes less from catching more on the shelf, where effort must fall, and more from three sources: deep-sea tuna under licensed, monitored fleets; mariculture of fish, molluscs and crabs; and seaweed. Seaweed is still an experiment. About 1,000 households in Cox's Bazar grow Gracilaria and Ulva, dried green seaweed sells for about Tk 1,000 a kilogram, and the country still imports nearly all of its agar (The Daily Star, 2026b). That combination of high prices and import dependence points to an unmet domestic market.

5.3 Ports, shipping, shipbuilding and recycling

Transport is the ocean sector most firmly on a growth path. Chattogram handled 3.41 million TEU and 138 million tonnes of cargo in 2025, and it carries about 92% of the country's trade (The Daily Star, 2026a). The Matarbari deep-sea port, whose first terminal was contracted in April 2025 at a cost of Tk 6,197 crore, mostly financed by JICA, will accept ships of up to 8,200 TEU and 100,000 deadweight tonnes. Its completion dates are uncertain, with reports citing 2029 for the first phase and 2041 for the whole port (The Daily Star, 2025a). The untapped value in this sector lies less in volume than in efficiency, transhipment and services. Shipbuilding remains small: one leading yard has exported 36 ships worth about US$138 million in total, and long-term project finance is scarce (Wu, 2026). Ship recycling supplies scrap steel and employment, but its future depends on compliance. In 2025, 23 yards were certified or provisionally certified under the Hong Kong Convention, while volumes fell by about a third and India overtook Bangladesh (The Financial Express, 2026b).

5.4 Offshore energy

Offshore energy shows the widest gap between potential and performance. Domestic gas output has fallen to about 1,620 million cubic feet a day against demand of about 4,000, and the 2024 offshore licensing round for 26 blocks attracted no bids. The government has since raised the gas price ceilings in its model production sharing contract to US$10.50–11 per thousand cubic feet and extended the deadline to March 2027 (UNB, 2026). Offshore wind is a second, longer-term option. Average offshore wind speeds at a 160 m hub height range from 6.3 to 8 m/s

(Joshi et al., 2024), and a 500 MW project off Cox's Bazar was approved for a feasibility study in 2023 (The Business Standard, 2023b). The Sustainable blue growth scenario assumes that at least one offshore gas discovery and the first offshore wind capacity come on stream in the 2030s.

5.5 Coastal and marine tourism

Tourism is already the largest ocean sector, driven by domestic demand and new transport links to the coast. Visits to Cox's Bazar rose from about 1.5 million in 2015 to an estimated 6–7 million by 2023 (Bhuiyan et al., 2020; The Business Standard, 2023a). The constraint is not demand but the condition of the assets that attract it. Saint Martin's Island now limits visitors to protect its coral (The Daily Star, 2025b), and tourism earns public conservation agencies very little: the Forest Department collected Tk 3.61 crore from 211,057 Sundarbans visitors in FY2023–24 (The Financial Express, 2024). The untapped value therefore depends on managing growth: diversifying destinations, charging for access to protected areas and reinvesting the revenue in the ecosystems that visitors come to see.

5.6 Salt, minerals and marine biotechnology

Salt is a traditional coastal industry that remains exposed to weather and low prices. In the 2025–26 season, 40,150 farmers on 67,757 acres produced 1.94 million tonnes, well short of the 2.71 million tonne target, after fog and unseasonal rain (Bonik Barta, 2026). Seabed minerals and marine biotechnology, which feature in national strategy documents, remain largely unexplored. The country lacks its own ocean research vessel, a gap the government has acknowledged (The Business Standard, 2025). These sectors are best treated as options to be preserved through research rather than as sources of near-term value.

6. Blue natural capital

6.1 The assets

Bangladesh's blue natural capital is dominated by mangroves. The Sundarbans covers 6,017 km^2 in Bangladesh, about 62% of the transboundary forest (Hilmi et al., 2025), and the national mangrove area, including coastal plantations on newly accreted land, is about 441,000 ha (ULAB CSD, 2025). Seagrass meadows and salt marshes are present along the south-east coast and around Saint Martin's Island but have not been mapped nationally, which is itself a barrier to valuing or crediting them. The country's only coral communities, at Saint Martin's Island, shrank from about 1.32 km^2 in 1980 to 0.39 km^2 in 2018 (Gazi et al., 2020). Fish stocks, the most economically important living asset, are declining (The Business Standard, 2025).

6.2 Blue carbon

The Sundarbans stores an estimated 56–91 Tg of carbon, equivalent to 205–334 $MtCO_2$ (Hilmi et al., 2025). Bangladesh's mangroves remove a further 2.0–7.6 $MtCO_2$ a year, depending on the sequestration rate assumed (Section 4.4). The value of these services depends strongly on the price used (Figure 3). At voluntary-market prices of US$6.34–25 per tonne, the stock is worth US$1.3–8.3 billion and annual sequestration US$13–190 million. At the central social cost of carbon of US$190 per tonne, the stock is worth US$39–63 billion, and annual sequestration US$0.38–1.45 billion.

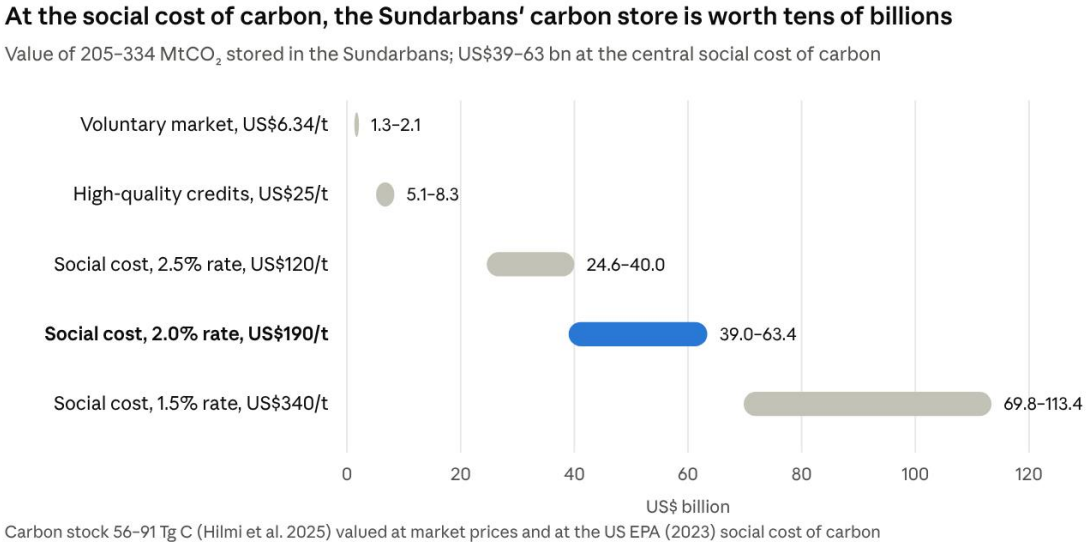


Figure 3. Value of the Sundarbans carbon stock at market carbon prices and at the social cost of carbon. Author's calculation from Hilmi et al. (2025), Ecosystem Marketplace (2025) and US EPA (2023).

The gap between the two valuations is the central point. Society loses tens of billions of dollars of climate value if the carbon store is released, but the carbon market would pay only a fraction of that to keep it. The loss of just 10% of the Sundarbans' carbon would release 21–33 $MtCO_2$, a climate damage of US$3.9–6.3 billion at the social cost of carbon. Carbon markets also pay only for additional benefits, such as restoration or avoided loss under credible threat, not for the continued sequestration of a forest that is already protected (IFC, 2023). For Bangladesh, the market route to blue carbon value therefore runs mainly through new mangrove planting, restoration of degraded plantations and, in time, seagrass and salt marsh. Protection of the Sundarbans itself is better framed as a public good deserving results-based or budget finance.

6.3 Other ecosystem services

Mangroves provide more than carbon. The provisioning services of the Sundarbans Reserve Forest, from fish, shrimp, fuelwood, honey and wax, are worth about US$145 million a year, and they support the incomes of many forest-dependent households (Nobi et al., 2025). Per hectare, the capture fisheries supported by coastal mangroves are worth about US$976 a year, against stated willingness to pay of only US$13 a hectare for storm protection (Rahman et al., 2018). The low figure for storm protection reflects how hard that service is to value, not its true importance. The ecosystem services of Saint Martin's Island, including tourism, fisheries and coastal protection, are worth about US$33.6 million a year (Rani et al., 2020).

Taken together, the measured flows of carbon sequestration at the social cost of carbon, Sundarbans provisioning services and Saint Martin's Island amount to roughly US$0.56–1.62 billion a year. That is equivalent to 5–15% of the market ocean economy, and it is a lower bound, because coastal protection, fish nursery functions and the services of seagrass, mudflats and the open shelf are left out. These values do not appear in the national accounts. Under the Degradation scenario they would shrink while the measured economy still appeared to grow, which is why natural capital accounting belongs in any serious blue economy strategy.

7. Barriers

The gap between the Business as usual and Sustainable blue growth pathways is explained by six groups of barriers (Table 5). They reinforce one another. Without data, fish stocks cannot be managed or offshore blocks priced. Without a lead institution, data collection and spatial planning stall. Without credible plans and data, investors stay away.

Table 5. Barriers to Bangladesh's blue economy

Barrier	Evidence	Sectors most affected	Consequence
1. Knowledge and data	No update of the ocean economy accounts since FY2014–15 (Patil et al., 2018). Only two modern ecosystem surveys, in 2018 and 2025, and no national ocean research vessel (The Business Standard, 2025). Basic resource data for the maritime area are lacking (The Financial Express, 2026a). Seagrass and salt marsh are not mapped nationally	All, especially fisheries, energy and blue carbon	Policy and investment decisions are made without baselines; stocks cannot be managed and carbon cannot be credited
2. Governance and institutions	The Blue Economy Cell (2017) made little progress (UNB, 2021). A 2024 review found limited cross-sector coordination and no agreed lead institution; marine spatial planning has begun but has no legal force (Daily Observer, 2026). The legal framework for preventing marine pollution is incomplete (Alam and Xiangmin, 2019)	All	Overlapping mandates, conflicts between uses and slow decisions
3. Finance and investment	The 2024 offshore licensing round received no bids (UNB, 2026). Long-term project finance for shipbuilding is scarce (Wu, 2026). The proposed allocation for blue economy research and development in FY2026–27 was Tk 200 crore (Daily Observer, 2026)	Energy, shipbuilding, ports, mariculture	Capital-intensive opportunities remain undeveloped
4. Technology and infrastructure	The fleet works within the shallow shelf and has not fished beyond about 100 m depth (The Daily Star, 2019). Deep-sea port completion dates are uncertain (The Daily Star, 2025a). Agar is almost wholly imported (The Daily Star, 2026b)	Fisheries, ports, seaweed, salt	Low value addition and dependence on imports
5. Environment and climate	Declining fish stocks, oxygen-deficient areas, high microplastic levels and jellyfish blooms (The Business Standard, 2025). Coral cover at Saint Martin's Island down about 70% since 1980 (Gazi et al., 2020). More than 43 million coastal residents exposed to cyclones, erosion and salinity (Shampa et al., 2023). Unseasonal weather cut the 2025–26 salt harvest (Bonik Barta, 2026)	Fisheries, tourism, salt, coastal infrastructure	Erosion of the natural capital on which the ocean economy depends
6. Equity and livelihoods	Blue growth risks dispossession, loss of small-scale fishers' livelihoods and the marginalisation of women (Bennett et al., 2021). In 2025, 11 workers died and 62 were injured in South Asian ship-recycling yards (The Financial Express, 2026b). Salt farmers bear weather and price risk	Fisheries, ship recycling, salt, tourism	Benefits captured by a few; social resistance to new uses

Three of these barriers bind hardest. The first is knowledge. A country that cannot estimate its fish stocks, map its seagrass or update its ocean accounts cannot set catch limits, attract exploration or sell blue carbon credits. The second is institutional fragmentation. Responsibility is divided among ministries for fisheries, shipping, energy,

environment, tourism and defence, and nearly a decade after the Blue Economy Cell was created there is still no body with the authority to resolve conflicts between them. The third is finance. The opportunities with the largest untapped value, such as deep-sea fishing, offshore energy, port efficiency and mariculture, need patient capital that will not come without the first two.

The barriers also differ by sector. For transport and tourism, the constraints are mostly about managing growth that is already happening. For fisheries, the constraint is the state of the resource itself, and growth must come from new species, new areas and value addition rather than from more effort on the shelf. For offshore energy, the constraint is the investment climate and geological uncertainty. For blue carbon and natural capital, it is the absence of maps, baselines and a framework that pays for protection.

8. Policy pathways

8.1 Principles

The pathway rests on five principles drawn from the analysis. Knowledge comes first, because most of the untapped value cannot be captured without stock assessments, maps and accounts. One accountable institution should own the agenda. Space should be allocated through a marine spatial plan with legal force, so that fishing, shipping, energy, tourism and conservation are planned together rather than fought over case by case. Finance should follow rules and data, not precede them. And natural capital should be measured alongside the market economy, so that growth that runs down ecosystems is visible. Figure 4 sets out the resulting sequence.

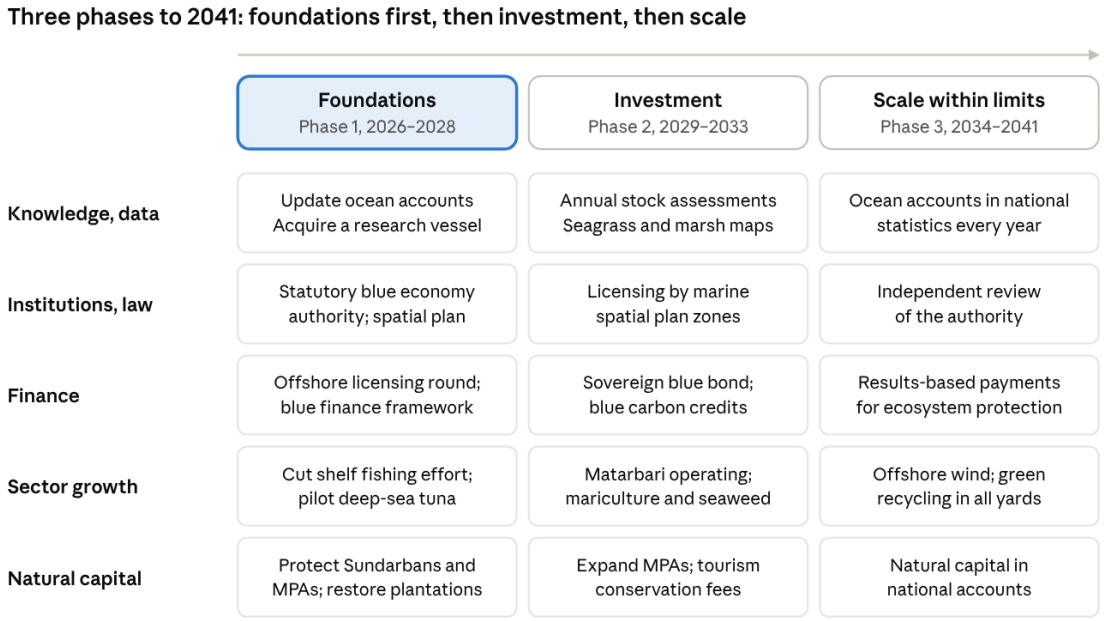


Figure 4. Proposed policy pathway for Bangladesh's blue economy to 2041 · three phases, five tracks. Author's design.

8.2 Phase 1, 2026–2028: foundations

The first phase builds the conditions for everything else. The government's stated intention to create an institutional framework for the blue economy in FY2026–27 (Daily Observer, 2026) is the opportunity to establish a statutory authority with a clear mandate to coordinate ministries, adopt the marine spatial plan and publish a baseline. The Bureau of Statistics, with the World Bank team that produced the first accounts, should update the ocean economy accounts and repeat them at regular intervals. A dedicated national research vessel, which the government has identified as a priority (The Business Standard, 2025), should support annual stock assessments. On the shelf, the most urgent step is to reduce fishing pressure, as the government itself has proposed through stricter limits on industrial trawler licences (The Business Standard, 2025), while piloting licensed and monitored deep-sea tuna

fishing. In energy, the revised offshore licensing round that closes in March 2027 (UNB, 2026) is the test of whether better terms and data can attract investors. The Sundarbans and the marine protected areas need enforcement budgets that match their legal status.

8.3 Phase 2, 2029–2033: investment

With rules and data in place, the second phase mobilises capital. A sovereign blue bond, following the example of the Seychelles in 2018 (World Bank, 2018), could finance fisheries management, coastal protection and mangrove restoration against clear performance indicators. Blue carbon credits from new mangrove planting and the restoration of degraded coastal plantations could earn revenue in voluntary markets or as internationally transferred mitigation outcomes, provided that projects are additional and benefits reach coastal communities (IFC, 2023). The Matarbari deep-sea port should begin operating in this phase, and incentives for mariculture, seaweed processing and agar production can build value chains that do not depend on capturing more wild fish. Ship recycling should complete the move to Hong Kong Convention standards in all active yards by 2030, the industry's own target (Wu, 2026). Tourism in protected areas should be financed through entry and conservation fees reinvested in the sites.

8.4 Phase 3, 2034–2041: scale within limits

The third phase scales what works. Offshore wind, for which a first 500 MW project off Cox's Bazar has been studied (The Business Standard, 2023b), can become a source of clean power as costs fall. Natural capital accounts for mangroves, fisheries and coastal ecosystems should be published with the national accounts, and results-based payments, from domestic budgets or international climate finance, should reward the protection of carbon stores and other services that markets do not price. An independent review of the blue economy authority after five years, with published indicators of economic value, stock health and benefit sharing, would keep the agenda accountable.

8.5 Indicators of progress

The pathway should be monitored through a small set of indicators: the ocean economy's share of GDP; the spawning biomass and catch of key stocks; mangrove, seagrass and coral extent; the share of the maritime area covered by the spatial plan and by effectively managed protected areas; private investment in offshore energy, ports and mariculture; and the share of benefits reaching small-scale fishers, women and coastal communities. Each indicator should have a published baseline by the end of Phase 1.

9. Discussion

9.1 How large is the prize?

The results temper the rhetoric. On the indicative accounts, the ocean economy produced about 2.5% of GDP in 2025, and even the sustainable pathway lifts it only to about 3% by 2041. Claims that the blue economy could supply a tenth of national output (The Business Standard, 2022) confuse the size of the sea with the size of the economy it can sustainably support. Yet the untapped value is large in absolute terms. At about US$10 billion a year by 2041, it is close to 1% of projected GDP, and US$41 billion in present value over 2026–2041. The case for the blue economy also rests on more than its share of output. Fish supply much of the national diet, at 24.7 kg per person a year (DoF, 2025), more than 43 million people live in the coastal zone (Shampa et al., 2023), and the coastal ecosystems that support the ocean economy are also the country's first line of defence against cyclones and storm surges.

The composition of the untapped value matters as much as its size. It is spread across sectors, so no single megaproject will unlock it. More than half lies in tourism and fisheries, the two sectors most dependent on the condition of natural ecosystems. The gap between the sustainable and degradation pathways is therefore about US$15 billion a year by 2041, half as large again as the untapped value alone. Avoiding degradation is worth US$4.8 billion a year by then, about half as much as developing what is new.

9.2 Trade-offs

A sustainable blue economy is not free of conflict. Rebuilding fish stocks requires cutting effort on the shelf, which imposes costs on fishing households before stocks recover. Coastal tourism brings income but has already contributed to coral loss and pollution at Saint Martin's Island and Cox's Bazar. Port expansion, industrial zones and shrimp ponds compete with mangroves and salt pans for the same coastal land. Offshore gas could ease the energy deficit but sits uneasily with a strategy that markets the country's blue carbon. Such conflicts cannot be resolved project by project. A marine spatial plan with legal force, supported by data and by an institution able to arbitrate between ministries, is the mechanism that would allow them to be resolved openly and consistently (Daily Observer, 2026).

9.3 Who benefits?

The distribution of gains will determine whether the blue economy is politically durable. About 1.76 million fishers were registered in 2023 (DoF, 2025), and most fish from small boats on the shelf. Salt is produced by about 40,000 farmers who carry weather and price risk (Bonik Barta, 2026). Ship-recycling workers face some of the most dangerous conditions in any industry (The Financial Express, 2026b). The risks identified by Bennett et al. (2021), including dispossession, the loss of small-scale fishers' livelihoods and the exclusion of women, are therefore not hypothetical in Bangladesh. The policy pathway responds through income support during periods of reduced fishing, priority for small-scale producers in mariculture and seaweed, enforced safety standards in ship recycling and benefit-sharing rules for blue carbon revenue. The indicators proposed in Section 8.5 include the share of benefits reaching these groups so that progress can be checked.

9.4 Lessons from elsewhere

Other coastal states show that the binding constraints identified here can be addressed. The Seychelles combined marine spatial planning with the world's first sovereign blue bond, which raised US$15 million in 2018 for fisheries and marine protection (World Bank, 2018). Bangladesh differs from small island states in two ways. Its ocean economy is a small share of a large and diversified national economy, and its coast is densely populated and highly exposed to climate hazards. Both strengthen the case for treating coastal ecosystems as infrastructure that protects the wider economy, not only as resources to be used.

9.5 Limitations and further research

The study has several limitations. The 2025 accounts are indicative, because they scale the FY2014–15 accounts by activity indicators rather than measuring value added directly. The scenario growth rates are informed judgements, although the sensitivity analysis shows that the main conclusions hold across a wide range. The natural capital valuation covers only carbon and a few site studies, omits coastal protection and nursery services, and is therefore a lower bound. No primary data were collected, and some recent figures come from press reports. Four lines of further research would be most valuable: an official update of the ocean economy accounts following the System of Environmental-Economic Accounting; regular stock assessments of the main commercial species; national mapping of seagrass, salt marsh and mudflats with their carbon stocks; and studies of how the benefits and costs of blue economy investment are distributed among coastal households.

10. Conclusions and policy recommendations

More than a decade after its maritime boundaries were settled, Bangladesh's blue economy remains largely untapped. On indicative estimates, the ocean economy produced about US$11 billion of value added in 2025, about 2.5% of GDP and a smaller share than in FY2014–15. Ports and coastal tourism have grown, but marine fisheries and offshore energy, the sectors that draw most directly on the sea's resources, have stagnated or declined. A sustainable pathway could add about US$10 billion a year to the ocean economy by 2041 compared with current trends, and a degradation pathway would cost about US$5 billion a year. Beneath the market economy lies natural capital whose value the national accounts do not record: the Sundarbans alone stores carbon worth tens of billions of dollars at the social cost of carbon, far more than carbon markets would pay to protect it.

The barriers are known, and they are mostly institutional rather than technical. Knowledge is missing, responsibility is fragmented and capital will not come without both. Five recommendations follow:

1. **Measure the ocean economy and its natural capital.** Update the ocean economy accounts, publish them regularly with the national accounts, and add natural capital accounts for mangroves, fish stocks and other coastal ecosystems.
2. **Create one accountable institution.** Establish a statutory blue economy authority in FY2026–27 with the power to coordinate ministries, and give the marine spatial plan legal force.
3. **Rebuild fisheries before expanding them.** Reduce fishing pressure on the shelf, protect the incomes of small-scale fishers during the transition, and develop deep-sea, mariculture and seaweed value chains under licensing and monitoring.
4. **Finance what the rules make bankable.** Follow the revised offshore licensing round with a blue finance framework, a sovereign blue bond and blue carbon projects for mangrove restoration, with clear benefit-sharing rules.
5. **Protect the assets that sustain the economy.** Fund enforcement in the Sundarbans and marine protected areas, manage tourism within carrying capacity with fees reinvested in conservation, and seek results-based finance for protecting carbon stores that markets do not reward.

If these steps are taken in sequence, with foundations first, Bangladesh can turn its maritime victory into lasting prosperity for its coastal population without exhausting the sea on which that prosperity depends.

Declarations

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Ethics statement: The study used published data only and involved no human participants or animals.

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