

PATHWAYS TO A SUSTAINABLE BLUE ECONOMY

ROLE OF FINANCIAL INSTITUTIONS

JUNE 2022

THE BANK OF PUNJAB &
SUSTAINABLE DEVELOPMENT
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Mr. Sayem Ali, Divisional Head Risk Analytics & Chief Economist, The Bank of Punjab. sayem.ali@bop.com.pk

Dr. Shahzad Ali Gill, Assistant Professor of Public Administration at The Islamia University of Bahawalpur. His specialization is on the Sustainable Development of the Blue Economy. shahzad.gill@iub.edu.pk

Ms. Aimen Zulfiqar, Project Associate, Sustainable Development Policy Institute (SDPI), Islamabad. aimen@sdpi.org

Mr. Abdullah Khalid, Project Assistant, Sustainable Development Policy Institute (SDPI), Islamabad. abdullah@sdpi.org

Engr. Ahad Nazir, Head of Centre for Private Sector Engagement (CPSE) at Sustainable Development Policy Institute (SDPI), Islamabad. ahad@sdpi.org

Mr. Aqib Saeed Mughal, Research Analyst, Bank of Punjab. aqib.saeed@bop.com.pk



FOREWORD BY **MR. ZAFAR MASUD**

The enormous potential of the Blue Economy to contribute towards economic growth and improvements in livelihoods has not been fully realized by the policy makers of Pakistan and across the world. Climate change and over-exploitation of our blue natural resources are extracting significant costs in terms of loss to marine life and bio diversity. The livelihoods of communities dependent on the blue resources are also being impacted, leading to rising unemployment and poverty.

In Pakistan, the institutional capacity remains weak and the fragmentation of roles and responsibilities between the federal, provincial, and local governments has led to a weak policy framework. This has also resulted in years of underinvestment in critical infrastructure including ports, hotels & tourism facilities, water storage, and drainage infrastructure. In many ways, the 2022 super floods are a result of lack of water drainage infrastructure. While Pakistan experienced significantly higher rainfall than average, the damage to crops, roads and housing infrastructure could have been averted if proper drainage facilities had been put in place.

In this report, we highlight the need for Pakistan to develop a larger pipeline for the issuance of green bonds by identifying green assets and scale up capacity to meet the international standards.

This report is our attempt to educate the public on the potential of the Blue Economy. These research projects are part of our organizations philosophy to highlight areas critical to the future of our economy which do not get coverage in the media and by the research institutions.

A handwritten signature in black ink that reads "Zafar Masud".

Zafar Masud
President & CEO
Bank of Punjab



FOREWORD BY **DR ABID Q. SULERI**

Harnessing ocean resources in a sustainable way has now become crucial in pursuit of Sustainable Development Goals (SDGs). SDG-14, which states 'life below water' directly relates to it. The blue economy incorporates a wide-ranging economic activity relating to sustainable development of resources and holdings in the oceans, related water bodies and coastal regions and rivers in a way that certifies inclusion, innovation, equity, and modern technology. Over three billion people on earth depend on the oceans for their livelihoods. The blue economy gives a cushion of around USD 2.3 trillion per year to the global economy. The world's 90 per cent trade takes place through sea and 350 million jobs are associated to fisheries. Out of the 142 coastal states in the world, Pakistan is ranked 74th in terms of the coastal length.

Pakistan has the potential to contribute to blue economy with more than US\$ 100 billion, but it earns only US\$ 450 million through fish exports. On the contrary, our regional peers are making billions of dollars from blue economy. Pakistan's traditional maritime activities such as shipping, fisheries, aquaculture, and coastal tourism require improvement and attention. Furthermore, non-traditional sectors such as tidal energy, transportation of more ships, and pharmaceutical industry also need investment for the attainment of long-term growth and benefits in blue economy.

Around 95% of trade in Pakistan transpires through sea. For the enhancement of trade, ports development is crucial. Karachi and Bin Qasim ports attract billions of dollars for Pakistan. Above all, Gwadar that has the immense potential due to its geostrategic location can pace up the Pakistan's trade, but challenges of clean water, electricity, education, and health made the progress in port development slow. The development of port in line with the latest requirements is necessary, as globally ports are automated with latest technologies. There is a need to build digital ports and port city by using advance technologies with a vision to enhance trade and promote the protection and conservation of marine environment for future generation.

Ocean is the planet's largest carbon-sink. It absorbs 90 per cent of the excess heat in our atmosphere, but we are incurring tremendous damage to this phenomenon by pushing waste and garbage into the ocean, thus putting the life of sea at risks. We need to take steps to provide finance for biodiversity conservation, environmental protection and restoration, fossil fuels substitutes, in addition to support nature-based solutions, and promote marine renewable energy and advance blue technologies. There is a need to build management model with an inclusive approach towards education, research, and innovation. The growth of blue economy cannot be possible without innovative technologies and skilled people. Literacy, training, research, and modern technologies can play an important role in their attainment whereas financial institutions can provide support to harness the blue economy potential in Pakistan.

In collaboration with the Bank of Punjab, Sustainable Development Policy Institute (SDPI) is leading the effort to build and functionalize the concept of blue economy by focusing on the various oceanic sectors. The aim is to create awareness about blue potential in Pakistan and to limit the negative impact on oceanic health by taking into account the further threats caused by climate change. This report on blue economy provides a thorough review of Pakistan's marine area and resources and blue economic development. It establishes the phase for recognizing the significant benefits feasible for the country's vast coastline and Exclusive Economic Zones (EEZs), besides focusing more on the priority for responsible sustainable development. This report will provide a clear-cut understanding about the blue economy and further develop and enhance the advancement in this field.

I hope that this report will contribute meaningfully towards sustainable development of Pakistan. At the same time, a series of blue economy reports could be produced in future with an objective to harness blue resources to assure a better economic future for the people in general and the country in particular.



Dr. Abid Q. Suleri,
Executive Director, SDPI

EXECUTIVE SUMMARY

According to the World Bank, the blue economy is defined as the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem. Throughout history, ocean and seas have been a source of wealth for nations. They provide crucial economic opportunities in fisheries and aquaculture, maritime, ports and tourism sectors. Since, Pakistan has a huge potential for growth in ocean economy, this report intends to highlight the opportunities present in the sector and way forward. The report describes the importance of blue economy in UN SDGs, elaborates its concept, discusses the blue economy in Pakistan, growth via green financing and sustainable livelihoods, and policy recommendations.

The importance of the blue economy was reinforced in 2015, when the UN incorporated it in Sustainable Development Goals (SDGs) as UN SDG Goal 14, which focuses on the life below water. The ocean is not only crucial from economic perspective, but is also a source of food, water, weather variations, and oxygen for human and other species. The components of the blue economy and their forward and backward linkages are on large scale. It consists on the sectors named: living resources, minerals, energy, coastal and maritime activities, ocean support services, maritime safety and security, and raw materials for marine biotechnology.

Pakistan, with a coastal area of 1050 km is blessed with significant blue natural resources. Its blue economy contributes an estimated US\$ 1 billion or around 0.4% of the national GDP. Bulk of this contribution is in the form of fisheries, coastal tourism, and maritime revenue. The more technologically advanced sectors including energy, pharmaceuticals and minerals industries are currently non-existent in the blue landscape. Maritime tourism contributes around US\$300 million (0.1 % of GDP).

Its current maritime revenue projection stands at \$183 million which is far behind India US\$5.6bn and Bangladesh US\$6bn. Its potential to develop blue economy is hampered by fragmented governance, lagging technology, marine pollution and degradation of mangrove forest.

Pakistan has a potential of breeding fish worth US \$2bn annually, however seafood exports stand at \$2bn only as of today. Fisheries account for less than 0.4% of GDP. Marine fisheries are depleted and overfished as per UN FAO. High costs are impacting sector's profitability. Pakistan lags behind its neighbors in aquaculture production. Post-harvest processing is under-developed. Fish processing in Pakistan is outdated and under-capitalized.

Maritime revenue contributes \$ US 183 mn to economy, while India earns US\$6bn and Bangladesh US\$5.6bn. As per World Bank, it has potential to increase to over US\$2bn. Gwadar port has a huge potential for growth. It is the third operational port developed under CPEC after the Karachi port and Port Qasim. Pakistan has an underdeveloped tourism industry. Pakistan earns 0.4% of GDP, while Thailand earns 18% and Malaysia earns 6%.

The government needs significant financing, domestic and external, over the medium term to modernize existing infrastructure, enhance sustainability of economic activities by reducing pollution of blue resources, and create new clusters of economic activity for uplifting livelihoods of the local communities. Global sustainable bond market is estimated to be around \$1 trillion by 2021. While Pakistan tasted success in its first green bond issuance in 2021, there is a need to develop a larger pipeline by identifying green assets and scaling up capacity to meet the international standards.

The communities living along the coastline are mostly poor. The economy and livelihoods of these rural communities are directly tied to their immediate environment, which consists of mangrove swamps and creeks fisheries, subsistence agriculture & livestock and fish farming. ADB reports that 79% of the population is characterized as poor, while 54% of these communities are in the poorest of the poor category. The development of coastal tourism facilities, supportive financing from banks, and sustainable fishing practices can go a long way in subsiding the poverty of these communities.

In order to take advantage of the abundant blue resources available to Pakistan, the government should mobilize investment in the sector. It should work with SBP for provision of easy credit and interest-free loans. Ministry of Maritime Affairs (MoMA) needs to take effective initiatives to enhance the efficiency and value-addition by fishing sector. The government should work with think tanks, and civil society to raise awareness regarding preserving mangroves forest. Special maritime industrial zones are needed to be developed with the installation of latest digital technologies.



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CHAPTER 1:

IMPORTANCE OF THE BLUE ECONOMY IN THE UN SDGS

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.¹

The origins of the Blue Economy concept can be traced back to the UN SDG Goal 14 that focuses on life below water. The global recognition that oceans are critical for Earth to remain habitable for humankind has led to a more integrated and institutional approach to dealing with the ocean 'blue' economy. Rainwater, drinking water, weather, climate, coastlines, much of our food, and even the oxygen in the air we breathe, are all ultimately provided and regulated by the sea. Throughout history, oceans and seas have been vital conduits for trade and transportation. Careful management of this essential global resource is a key feature of a sustainable future envisioned under UN SDG 14.



CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

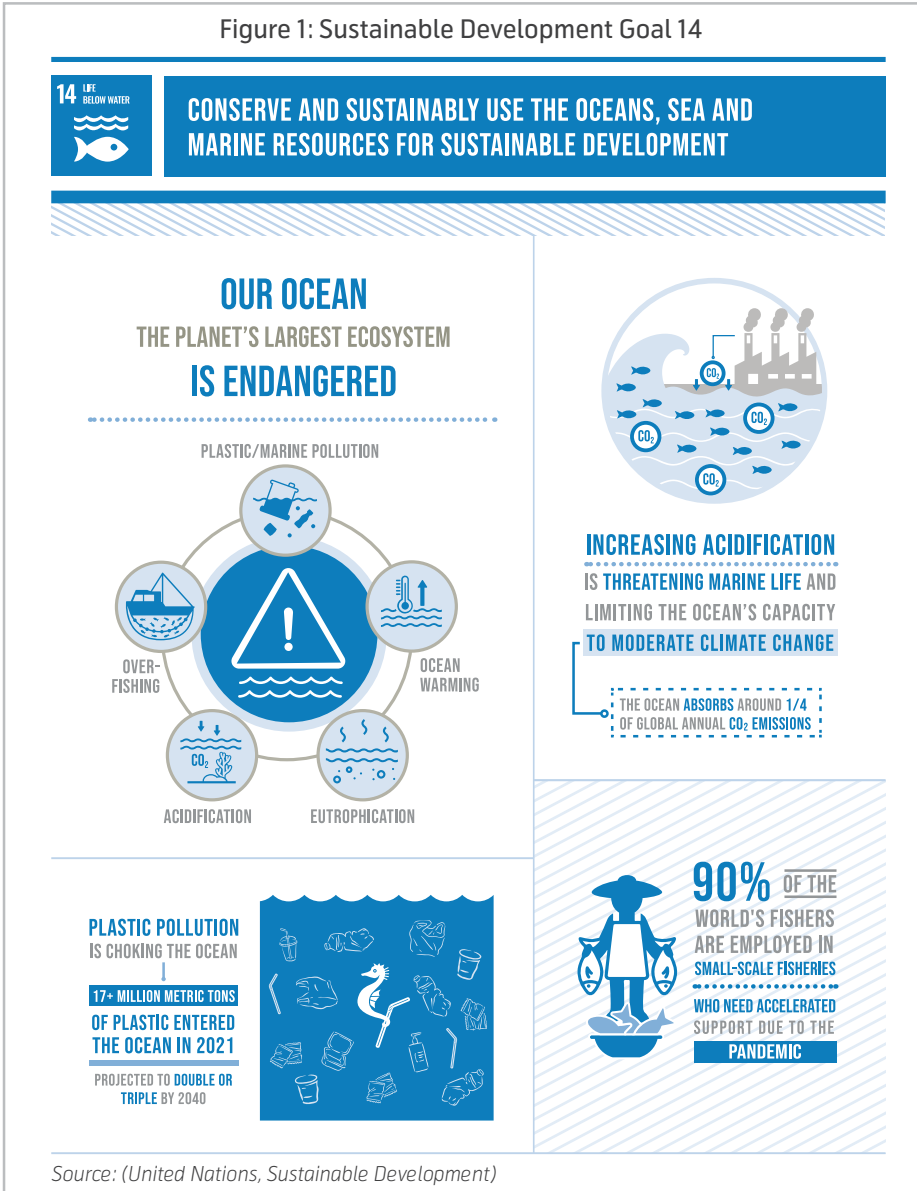
The outcome document of the UN Summit on the 2030 Agenda: "Transforming our world: the 2030 Agenda for Sustainable Development", includes an emphasis "to protect the planet from degradation, including sustainable consumption and production, sustainably

¹ United Nations. Sustainable Development. <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>.

managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations.

The UN report discloses details of the degradation caused to the 'blue' resources because of unsustainable policies of a fast-growing human population. Nearly 30% of marine habitats have been destroyed, and 30% of the world's fish stocks are over-exploited². Marine pollution has reached shocking levels; each minute 15 tons

Figure 1: Sustainable Development Goal 14



² United Nations. 2015. Resolution adopted by the General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development. United Nations.

of plastic are released into the oceans. 20% of all coral reefs have been destroyed irreversibly, and another 24% are in immediate risk of collapse³. Approximately 1 million sea birds, 100,000 marine mammals, and an unknown number of fish are harmed or die annually due to marine pollution caused by humans. It has been found that 95% of sea birds in Norway have plastic parts in their guts, micro plastics are another form of marine pollution.

The deterioration of coastal waters has become a global occurrence, due to pollution and coastal eutrophication (overflow of nutrients in water), where similar contributing factors to climate change can affect oceans and negatively impact marine biodiversity.

Characterized by extinctions, invasions, hybridizations, and reductions in the abundance of species, marine biodiversity is currently in global decline. The declining health of the oceans has a negative effect on people, their livelihoods and entire economies, with local communities which rely on ocean resources being the most affected⁴. Oceans alleviate the impact of climate change and absorb around 23% of the annual emissions of various forms of carbons. Because of the absorbed carbons, seawater becomes more acidic, and its pH levels drops significantly. Ocean acidification puts coral reefs and other species in danger which impacts the marine food chain and ecosystem services including fisheries, transportation and even tourism⁵.

The UN has defined 10 Targets and 10 Indicators for SDG 14. Targets specify the goals and Indicators represent the metrics by which the world aims to track these targets, see Table 1.

Table 1: UN SDG Goal 14 Targets and Definitions

Targets	Details	UN Definition
14.1	Reduce Marine pollution	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution. Measured by the index of coastal eutrophication and floating plastic debris density.
14.2	Protect and restore ecosystems	By 2020, sustainably manage and protect marine and coastal ecosystems and take action for their restoration in order to achieve healthy and productive oceans. Measured by the proportion of national exclusive economic zones managed using ecosystem-based approaches.

³ *ibid.*

⁴ *ibid.*

⁵ *ibid.*

14.3	Reduce ocean acidification	Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels. Measured by the average marine acidity (pH) measured at agreed suite of representative sampling stations.
14.4	Sustainable fishing	By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics. Measured as the proportion of fish stocks within biologically sustainable levels.
14.5	Conserve coastal and marine areas	By 2020, conserve at least 10% of coastal and marine areas, consistent with national and international law. Measured as the coverage of protected areas in relation to marine areas.
14.6	End subsidies contributing to overfishing	By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported, and unregulated fishing. Measured as the progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported, and unregulated fishing.
14.7	Increase the economic benefits from sustainable use of marine resources	By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture, and tourism. Measured as the sustainable fisheries as a proportion of GDP
14 A	Increase scientific knowledge, research, and technology for ocean health	Increase scientific knowledge, develop research capacity, and transfer marine technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries. Measured as the proportion of total research budget allocated to research in the field of marine technology.

14 B	Support small scale fishers	Provide access for small-scale artisanal fishers to marine resources and markets. Measured as the progress by countries in the degree of application of a legal/ institutional framework which protects access rights for small-scale fisheries.
14 C	Implement and enforce international sea law	Enhance the conservation and sustainable use of oceans and their resources. Measured as the number of countries making progress in ratifying, accepting, and implementing the United Nations Convention on the Law of the Sea.

Source: (United Nations, Goal 14 Department of Economic and Social Affairs 2021)

PAKISTAN COMMITTED TO SDG TARGETS

Pakistan affirmed its commitment to the 2030 Agenda for Sustainable Development by adopting the Sustainable Development Goals (SDGs) as its own national development agenda through a unanimous National Assembly Resolution in 2016. Since then, the country has made considerable progress by mainstreaming these goals in national policies and strategies and developing an institutional framework for SDGs implementation in Pakistan. SDG support units have been established at federal and provincial levels with the planning institutions for implementation and monitoring progress. In 2018, the Government designed and approved a National SDGs Framework that envisages a national vision to prioritize and localize SDGs. Localized provincial SDG Frameworks are being formulated. The focus of the government is on mainstreaming SDGs in the planning processes, ensuring strong monitoring and reporting on SDGs and ensuring public financial allocations are aligned to SDGs.

CHAPTER 2:

BLUE ECONOMY CONCEPT

Since the passage of the 2015 UN Resolution the 2030 Agenda for Sustainable Development (A/RES/70/1), the scope of the 'Blue Economy' has expanded significantly (United Nations, Resolution adopted by the General Assembly, Transforming our world: the 2030 Agenda for Sustainable Development 2015). While the core emphasis remains towards social economic development and dynamic balance of resources and environment, the new thinking around the blue economy transformation incorporates all economic activities that are directly or indirectly linked to the ocean economy. The United Nations Commission on Sustainable Development highlighted new approaches to adopt "blue economy," and believes it is consistent with the core contents of the 2012 UN RIO+20 Summit⁶.

Green economy mentioned in Rio+20 negotiations represent a transformation of economic development model. International society tends to refer blue economy to green economy or green development model in ocean and coastal zone development and management (United Nations, Rio+20 Pacific Preparatory Meeting 2011). Based on analysis on marine industrial activities and the health of marine eco-system, we should maintain a healthy marine and land ecosystem, solve pollution such as marine transport waste and plastic litter and micro plastic, mitigate the global change effects, and construct a blue economy sustainable management model based on maintaining a healthy ecosystem⁷.

⁶ United Nations. 2011. "A Blueprint for ocean and coast sustainability."

⁷ Lu, Wenhai, and Caroline Cusack. 2019. "Successful Blue Economy Examples With an Emphasis on International Perspectives." *Frontiers in Marine Science* 6. doi:10.3389/fmars.2019.00261.

The ocean has been a source of wealth for millennia, linking economies around the world. Many large cities and centers of commerce developed based on access to the sea, and now some 38% of the global population is estimated to live within 100 kilometers of the coast⁸. The ocean is integral to the global economy. If the global blue economy, were compared to a national economy, it would be the seventh largest in the world, and the ocean as an economic entity would be a member of the G7. It operates in the planet's vastest ecosystem: oceans hold 97% of all our water and 80% of all life forms⁹. Oil and gas from the ocean's floor provided 30% of global consumption needs in 2014, up from 20 percent in 1980¹⁰.

Fishery resources—mostly from the sea—provided more than 3.1 billion people with almost 20 percent on average of their consumption of animal protein (United Nations, *The State of World Fisheries and Aquaculture : Contributing to food security and nutrition for all 2016*). The estimated 1 to 1.4 million different species that live in the ocean support a growing commercial interest in marine genetic resources that is leading to the commercial development of pharmaceuticals, enzymes, and cosmetic products. The rate of patent applications related to marine genetic material increased at rates exceeding 12 percent per year from 1999 to 2008. Over 5,000 genes derived from marine organisms had been patented by 2010¹¹.

Yet economic activity linked to the ocean may be set to become even greater. In recent years the ocean has been labeled an “economic frontier” as the expanding global population searches for new sources of growth, while rapid technological advances make new resources and spaces accessible. The physical context of the ocean shapes this frontier: a fluid, buoyant, three-dimensional environment, where resources such as fisheries can span multiple jurisdictions and political boundaries. Economic activity in this space has traditionally focused on such industries as shipping, shipbuilding, and marine equipment; coastal and maritime tourism; inshore and offshore marine aquaculture; fishing and fish processing; port facilities and cargo handling; and offshore oil and gas.

The mix will change dramatically in the coming decades, according to the OECD (Organisation for Economic Co-operation and Development 2016), with a bigger role for emerging industries that include offshore wind, tidal, and wave energy; oil and gas exploration and production from previously inaccessible waters; offshore aquaculture; seabed mining; and marine biotechnology. Additional industries yet to be “born” at all may join this list: carbon capture and storage, for example. Whether established or emerging, these industries are experiencing innovation and change.

8 L. Inness, and Simcock A. 2016. *The First Global Integrated Marine Assessment World Ocean Assessment I*. United Nations General Assembly. <http://hdl.handle.net/123456789/1741>.

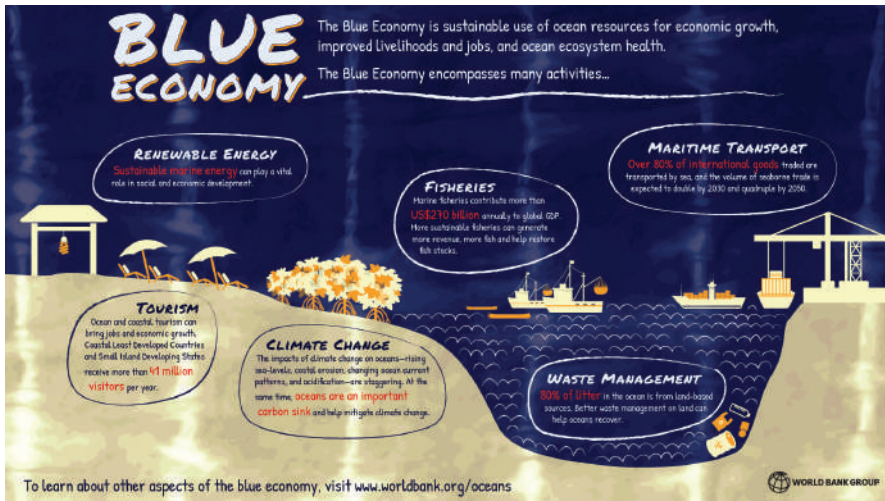
9 European Commission. 2021. “Transforming the EU’s Blue Economy for a Sustainable Future - The role of the regions - 12INF021673.” <https://eu.app.swapcard.com/event/eu-regions-week/planning/UGxhbm5pbmdfNjMxMjY3>.

10 Brakenhoff, R. 2015. “Outlook for Offshore Energy.” *Oil & Gas Financial Journal*. <http://www.ogfj.com/articles/print/volume-12/issue-4/features/outlook-for-offshore-energy.html>

11 Costello, Mark John, Marta Coll, Roberto Danovaro, Pat Halpin, Henn Ojaveer, and Patricia Miloslavich. 2010. “A Census of Marine Biodiversity Knowledge, Resources, and Future Challenges.” *PLoS ONE* 5 (8): e12110

The potential benefits are considerable and could help address many of the key challenges facing the expanding global population in coming decades, from food insecurity to the search for new sources of energy and jobs¹².

Figure 2 Blue Economy



Source: (World Bank <https://www.worldbank.org/en/news/infographic/2017/06/06/blue-economy>)

The projected growth presents both opportunity and risk for coastal resources. New sources of economic growth come with risks of adverse social impacts in coastal communities and environmental degradation. Many countries around the world have started to examine these potential outcomes, putting forward integrated policies that seek to maximize the opportunity and minimize the risk.

A Blue Economy approach to sustainable use of ocean spaces and resources must be both ecologically regenerative and socially just, accounting for the needs of current and future generations¹³. It includes all sectors of society in planning for ocean activities and balances the needs of different constituencies to equitably share in the benefits of the ocean. A Blue Economy approach recognizes ocean-climate interactions; it anticipates and plans for the effects of climate change on coastal and marine resources and conserves or regenerates these natural resources to increase resilience¹⁴.

12 P.G. Patil, Virdin J, Colgan C.S, Hussain M.G, Failler J.P, and Vegh T. 2018. "Toward a Blue Economy : A Pathway for Bangladesh's Sustainable Growth." World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/30014> License: CC BY 3.0 IGO.

13 Sumaila, U.R. et al. 2019. "Benefits of the Paris Agreement to ocean life, economies and people." Science Advances eaau3855.

14 NLA International. 2021. The Blue Economy in Practice Raising Lives and Livelihoods

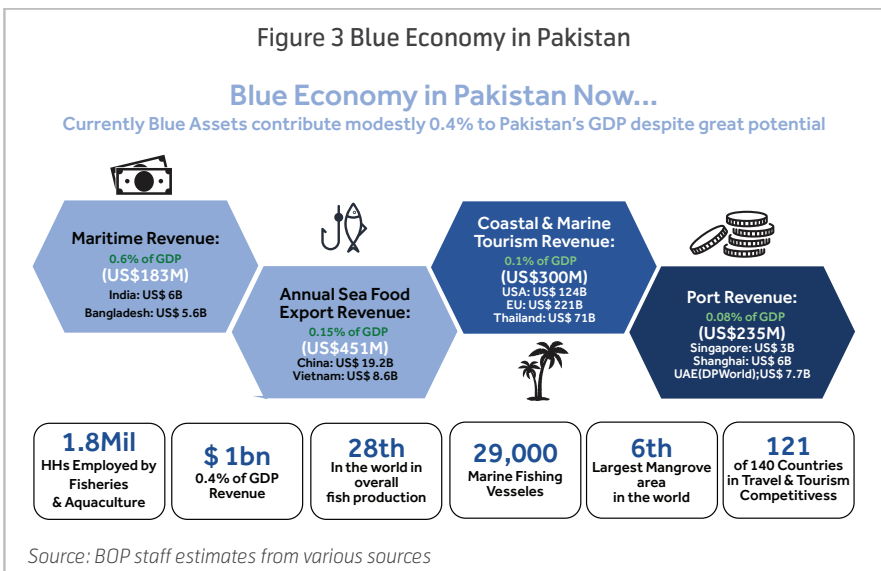
Table 2: Components of the Blue Economy

Sectors	Industry / Service
Living Resources	Capture fisheries Sea Plants (seaweeds and other macro and micro algae) Mollusks (mussels, clams, and pearly oysters) Other (e.g., sea cucumber and sea urchin) Processing and retailing Marine aquatic product preparation and packaging Fresh and frozen seafood processing Fish and seafood markets
Minerals	Aggregates mining Sand and gravel mining Other minerals Support activities for non-metallic minerals mining Marine (including deep sea) minerals mining Sea salt production
Energy	Offshore oil and gas Oil and gas pipeline and related structures Coastal electric power generation Renewable energy sources Wind (onshore in coastal locations and offshore)
Coastal and maritime research and activities	Tourism Research and training institutions and projects Secondary and higher education institutions
Ocean support services	Insurance and inspection services
Desalination	Desalination plants and construction of related water supply systems
Maritime safety and security	Military, coast guard, and other public safety organizations; private security
Other raw materials (e.g., for marine biotechnology)	Pharmaceuticals, chemicals, biofuels, bio-fertilizers, biopolymers.

Source: (World Bank)

CHAPTER 3: THE BLUE ECONOMY IN PAKISTAN

With a coastal area of 1,050 km including the continental shelf, Pakistan is blessed with significant 'blue' natural resources. Pakistan has extended coastline, marine resources, harbors, sea trade and maritime professionals for the development of maritime sector. Pakistan has got an extended Exclusive Economic Zone (EEZ) and Continental Shelf. Exclusive Economic Zone (EEZ) is known to be a sea zone appointed by the UNCLOS. Pakistan is estimated to have the 6th largest mangrove area in the world.



The blue economy of Pakistan contributes an estimated US\$ 1 billion or around 0.4% of the national GDP. Bulk of this contribution is in the form of fisheries, coastal tourism, and maritime revenue. The more technologically advanced sectors including energy, pharmaceuticals and minerals industries are currently non-existent in the blue landscape.

Maritime tourism contributes around US\$300 million (0.1 % of GDP); despite having huge potential for domestic and international tourism¹⁵. Its current maritime revenue projection stands at \$183 million which is far behind India US\$5.6 bn and Bangladesh US\$6 bn. Pakistan’s coastal areas are breeding grounds for commercial fish potentially worth of US\$ 2 billion annually, however as of today the seafood exports earning are only around \$450 million (0.2% of GDP)¹⁶.

However, its potential to develop a blue economy for poverty alleviation and SDG achievements is mainly limited by fragmented governance, lagging technology, poor quality control, lack of innovation, lack of spatial zoning, degradation of mangrove forest and marine pollution. Furthermore, with the poorest air quality among 180 countries ranked by the Environmental Performance Index, Pakistan’s pollution has a high cost tag of about \$30 billion, i.e., 10% of GDP and is undermining the sustainability and resilience of Pakistan’s economy.

Table 3: Environment Protection Index (Ranking out of 180 countries)

	Rank	Score	Change (10yrs)	Summary
EPI	142	33.1	6.1	Improving but still among the lowest in the world
Biodiversity	127	46.1	-0.7	Loosing biodiversity
MPA	69	6.9	-	More potential, considering long coastal line
Fisheries	119	7.6	-0.6	Deteriorating
Fish Stock	79	6.2	-1.2	Diminishing
Marine Trophic	98	9.1	-	Not clean enough

Source: (<https://epi.yale.edu/epi-results/2020/country/pak>)

¹⁵ <https://dailytimes.com.pk/662925/pakistan-has-4-5bn-coastal-tourism-potential-experts/>

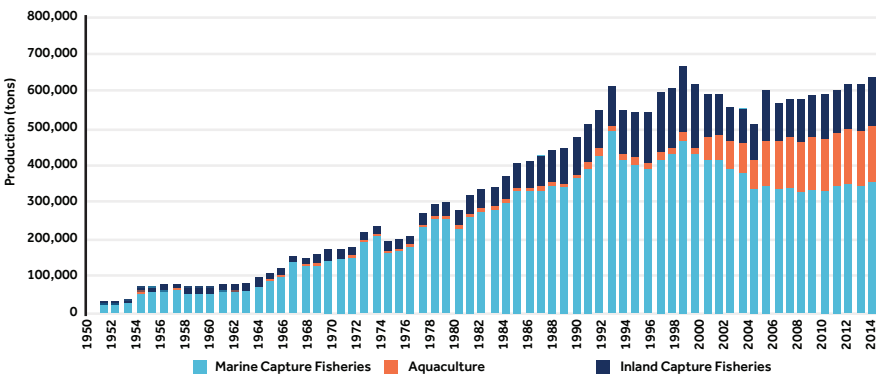
¹⁶ <https://thenationalfrontier.com/2021/03/26/how-much-can-pakistan-earn-from-blue-economy/>

FISHERIES

Pakistan’s fisheries contribute modestly to the national GDP growth and social development. Fisheries account for less than 0.4% of GDP. Marine capture fisheries produced almost 360,000 tons of fish, while inland capture fisheries and aquaculture operations produced a further 132,500 tons and 151,000 tons, respectively (The State of World Fisheries and Aquaculture : Contributing to food security and nutrition for all, 2016). The marine sector is a significant economic pursuit for people along the coasts of Sindh and Balochistan, while small-scale aquaculture and inland capture fisheries are found across the country. Fisheries employ a reported 390,000 people directly, and when secondary jobs such as processing, transporting, and retailing are considered, the number rises to between 900,000 and 1,800,000 jobs in total¹⁷.

Yet Pakistan’s fisheries face challenges and are not achieving their economic potential. The marine capture fishery has experienced a decrease in overall production since the 1990s, and a decrease in per-unit value. A recent stock assessment by the Government of Pakistan and the United Nations Food and Agriculture Organization found that Pakistan’s marine fisheries are depleted and overfished, and that a continuation of current levels of fishing will seriously undermine production further. The decrease in production has occurred even while total fishing effort (the harvest capacity of the fishing fleet and the time spent fishing) has increased. In addition, costs are high, undermining the sector’s profitability, while the shrinking resource base beneath the water undermines livelihoods in vulnerable, small-scale fishing communities.

Figure 4: Pakistan Fisheries Production (tons)



Source: (United Nations, *The State of World Fisheries and Aquaculture : Contributing to food security and nutrition for all 2016*)

17 World Bank. 2018. Revitalizing Pakistan’s Fisheries: Options for Sustainable Development. World Bank.

Aquaculture is also failing to fulfill its potential, despite favorable agro-climatic conditions. While the country has extensive resources of fresh and brackish water, aquaculture in Pakistan is limited in its variety and extent. The industry is dominated by carp, with small quantities of tilapia and trout. Marine and coastal aquaculture, such as shrimp farming, are almost non-existent. Despite good agro-climatic conditions, Pakistan lags its neighbors in aquaculture production: Bangladesh and India are among the world's top-five aquaculture-producing countries, while Pakistan ranks 28th. Its aquaculture growth rate of approximately 1.5 percent per year over the past five years is considerably slower than rates in India and Bangladesh. Furthermore, Pakistan's aquaculture growth is well behind these countries' growth during equivalent periods of their aquaculture industry's development, despite continued strong global demand.

Post-harvest processing is under-developed, contributing to relatively low value addition in the sector. Post-harvest processing in Pakistan is characterized by poor quality control and outdated processing technologies. Much of the sector's capacity is focused on lower-grade products such as fishmeal. Limited capacity for high-quality and certified processing inhibits access to lucrative export markets. Poor sanitary and phytosanitary (SPS) conditions led the EU to impose an import ban for several years and continue to partially restrict access in a range of markets. Exports, which have averaged about US\$350 million annually in recent years, appear to have plateaued.

Fish processing in Pakistan is outdated and under-capitalized, which contributes to the relatively low value addition of the sector. As a highly perishable commodity, fish often needs rapid processing. The most valuable products are fresh, destined for direct human consumption (a share of 53 percent of global production), followed by frozen fish (26 percent), canned fish (11 percent), and cured fish (10 percent). Different levels of processing create different value multipliers, with significant implications for the potential growth in fishery exports.

Table 4: Comparison of Fish Production

	Annual Production (tons)			
	Pakistan	Bangladesh	India	Myanmar
Inland fisheries	276,501	2,821,266	6,181,000	2,462,750
Capture	128,235	961,458	1,300,000	1,463,120
Aquaculture	148,266	1,859,808	4,881,000	999,630
Marine fisheries	346,841	588,988	3,414,821	2,854,200

Source: (United Nations, The State of World Fisheries and Aquaculture : Contributing to food security and nutrition for all 2016)

According to Worldwide Fund for Nature (WWF), approximately 90% of the fish consumed in Pakistan is decayed, and unsafe for human intake. Fish should be kept between 0 and 5 degrees Celsius to protect them from rotting. Pakistan exported

about 10 percent of the fish production, while the remaining was degraded as most boats deprived of appropriate deep freezers and other resources to store up the fish¹⁸. The average price of Pakistan's exporting fish is USD 2.3/kg in the international market. The current price of fish is less in comparison to our neighboring countries, the average price is around USD 7/kg in the region (Usman, Tahir & Shaheen 2020). According to the research the fishing sector can be improved, and fisherman problems can be solved by providing education to fisherman related to modern technologies¹⁹.

The sector has potential to be a much stronger engine of economic growth and social development. The marine capture fishery has suffered a decrease in production and per-unit value due to overfishing over the past two decades (Fanning, et al. 2016). A program to reduce the current levels of overfishing could help reverse these trends, maintain current production quantities, and increase the value of that production. The aquaculture industry is for now growing only slowly. Improvements to biosecurity and food safety systems could help Pakistan gain access to international markets and reduce risks that hold back private investment.

The major commercial fish stocks face considerable overfishing, and in some instances, are already depleted. Unless fishing effort is reduced, especially in the demersal finfish and shrimp trawl fisheries, stocks and harvests will continue to decline, with major ecological and socio-economic consequences. At present, Pakistan's marine fisheries are largely open access, with few effective mechanisms to limit fishing effort through input controls, such as the number of fishing licenses, or output controls, such as a quota system. Sustainability requires a long-term strategy on fleet capacity.

The dissolution of the Ministry of Livestock and Dairy Development in 2010 and the transfer of different elements of fisheries governance and management to different line ministries have resulted in a highly fragmented governance system. This was exacerbated by changes under the Eighteenth Constitutional Amendment of 2010 which transferred executive powers to the provinces, including control over Zones II and III of the EEZ. The original Fisheries Act (1897) now operates as a Provincial law under the residuary legislative and executive power of the provinces, with Federal fisheries legislation mainly limited to the Exclusive Fishery Zone (Regulation of Fishing) Act (1975) and the Pakistan Fish Inspection and Quality Control Act (1997). This fragmented framework has led to delays in meeting international commitments. Also, local governments have limited control over fishing capacity, which holds back regulation of indiscriminate fishing practices that damage stocks and ecosystems.

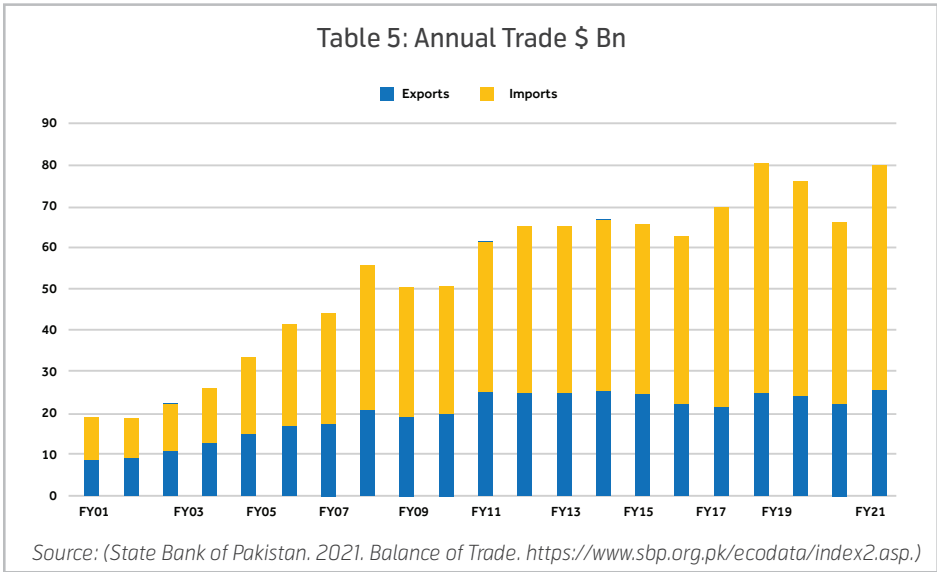
18 <https://dailytimes.com.pk/975462/90-of-fish-consumed-in-pakistan-is-contaminated-wwf/>

19 <https://pide.org.pk/wp-content/uploads/pv-32-policy-insights-to-maritime-economy-in-pakistan.pdf>

MARITIME REVENUE

The annual international trade in 2020 was nearly US\$ 80 bn of which US\$ 25.6 bn were exports and US\$ 54.5 bn were imports. The growth in annual trade has grown considerably in the last decade from US\$ 50 bn in 2010 to around US\$ 80 bn in 2021 (26% of GDP). Nearly 97% of international trade takes place through sea transport, with the remaining being traded with the neighbors.

Despite the significant volume of trade, the contribution to the economy is only US\$ 183 mn (0.06% of GDP). This compares poorly with regional economies where India earns US\$ 6 bn and Bangladesh US\$ 5.6 bn. According to the World Bank the potential is to increase maritime revenue to over US\$ 2 bn, however due to lack of investments over decades the size of the ship industry remains abysmally low with only 11 cargo ships operated by the Pakistan National Shipping Corporation (PNSC). By comparison China owns and operates over 6,000 cargo vessels and Singapore more than 3,500 vessels.



PORTS REVENUE

International trade accounts for bulk of the tax collected by the federal government, according to estimates nearly half the revenue collected by FBR comes from imports. However, the revenue from ports operations remains abysmally low, estimated at around \$235 million (0.08% of GDP).

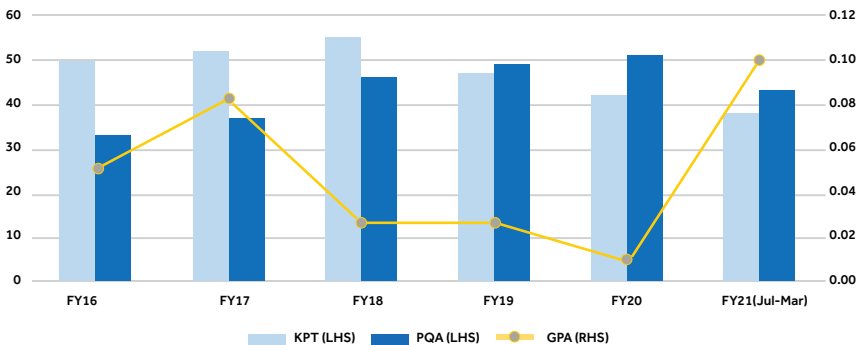
Figure 6: Karachi Port KPT



Source: KPT Presentation

There are three major ports operational in Pakistan with the biggest being the Karachi Port Trust (KPT). This terminal handles cargo of 50 to 60 million tons every year. Port Qasim Authority (PQA) is the second major port which handles cargo of 40 to 50 million tons every year. The Gwadar Port Authority is the third operational port developed as part of the China Pakistan Economic Corridor (CPEC). Under development phase, the Gwadar Port is currently handling cargo of only 50 to 60 thousand tons annually, although the traffic is expected to increase significantly in the years ahead.

Figure 7: Annual Cargo (Mn tons)



Source: (Economic Survey 2021, Ministry of Finance)

Gwadar can play a significant role in converting the economy of Pakistan through transshipment alone. It has been analyzed from the history that shipping is the least expensive medium of transport.

Today 80 percent of the worldwide merchandise in volume has been transported via sea, which is estimated to be around 10 billion tons. Pakistan in this sphere can perform a very significant role which can assist in the growth of its economy. For Pakistan, the supporting position is the high Liner Shipping Connectivity Index (LSCI). This index indicates that around the world, how good the connectivity is between ships and ports. Pakistan is lies at 34.06 points, with a better position than Bangladesh but lagging behind India which stand at 54 points. China is in the lead with an index of 151.91 points. This is where Pakistan should acquire benefits and built up its transshipment industry and improve its operations²⁰.

Gwadar port has the potential to be established as a regional hub and transshipment port. Gwadar can achieve the position among the leading five transshipment hubs worldwide by altering the ship traffic flow from Dubai to Gwadar. For every year Dubai Knobs around 21mn TEUs (20-ton equivalent units). This indicates the prospect that can lie in wait for Gwadar. But modernization of these ports is very imperative as the world is now transforming its operations from manual port to fully smart ports, Pakistan needs to take steps to install the modern technologies at the ports (Aijaz & Butt 2021). After the full development, the Gwadar Port being a tax exempted port and without port congestion can attain the enormous benefits²¹.

For the Progress of Port there is a need to improve the Gwadar port City. In Gwadar city appropriate infrastructure is still missing common concerns such as supply of clean water, electricity and gas, and connectivity with other regions are responsible for the dearth of progress. it is a very abandoned city with massive challenges not only in the areas of electricity and water, but health and education are also concerning issues over there. The future of young people of Gwadar, remains depressing. From the past fifteen years negligible progress has been made on a under construction degree collage. Gwadar University, which China wants to connect with a Chinese university has not progressed since its launch due to the lack of funds. For the progress of the Gwadar Port, Port city development is necessary. With improving the living conditions of port city, the Gwadar port can achieve the benefits in the future²².

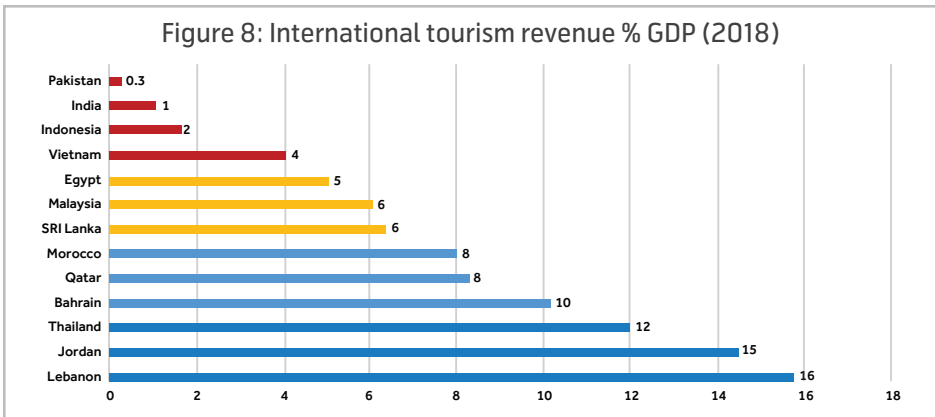
20 <https://www.thenews.com.pk/print/688791-blue-economy-pakistan-s-untapped-potentials>

21 <https://www.thenews.com.pk/print/688791-blue-economy-pakistan-s-untapped-potentials>

22 <https://www.thethirdpole.net/en/regional-cooperation/pakistan-gwadar-port-long-way-from-trade-hub-vision/>

COASTAL & MARINE TOURISM

Pakistan has an underdeveloped tourism industry, comparing poorly with other regional countries in attracting international tourists. Lack of connectivity, tourist infrastructure and weak security environment have all led to an underdeveloped tourist industry. The countries with the highest tourism revenues are countries with large coastal areas and world class infrastructure facilities. Thailand earned 18% of GDP through international tourism, countries like Sri Lanka and Malaysia earn 6% of GDP through tourism. Pakistan in comparison earns 0.4% of GDP, making it one of the most underdeveloped markets for international tourism.



Source: (*The Global Economy*²³ database)

Domestic coastal tourism revenue is estimated to be around US\$ 300 mn (0.1% of GDP). Pakistan has considerable potential to grow revenue from coastal and marine tourism. According to the Maritime Study Forum, US\$ 5 bn can be generated annually from developing coastal tourism infrastructure²⁴. The success of neighboring countries should serve as a benchmark. In India, the Kerala state tourism policy 2012 focused on developing the unique geography of 600 km of coastline and 1,500 km of back water (rivers and canals) with national wildlife parks. As a result, the Kerala state attracted over 660,000 foreign tourists and over 14.6 mn domestic tourists by 2017. Tourism revenue earned in 2017 was US\$ 4.5 bn out of which US\$ 1.1 bn was foreign exchange earnings²⁵. Maldives is another success story, its world-renowned coastal resorts are the single biggest contributor to GDP, accounting for 35% of national GDP and over 60% of the foreign exchange earnings.

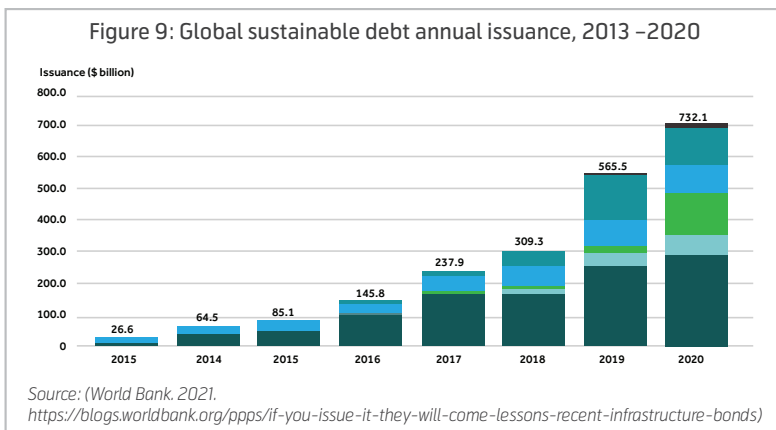
23 The Global Economy. 2019. International tourism revenue, percent of GDP by country, around the world. https://www.theglobaleconomy.com/rankings/international_tourism_revenue_to_gdp.

24 <https://dailytimes.com.pk/662925/pakistan-has-4-5bn-coastal-tourism-potential-experts/>

25 Fatima, Naureen, and Muhammad Akhtar. 2020. "Ma <https://dailytimes.com.pk/662925/pakistan-has-4-5bn-coastal-tourism-potential-experts/>ritime Tourism: Global success stories and the case of Pakistan." *Polaris – Journal of Maritime Research* 2: 1-29.

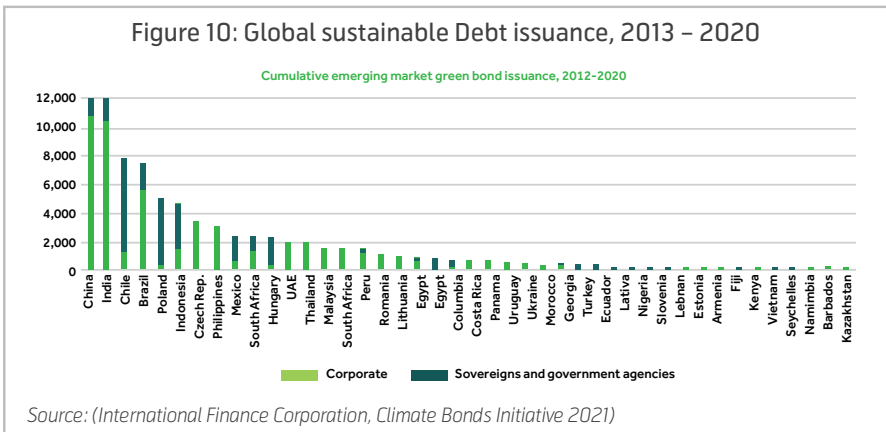
CHAPTER 4: GREEN FINANCING FOR THE BLUE ECONOMY

The government will need significant financing, domestic and external, over the medium term to modernize existing infrastructure, enhance sustainability of economic activities by reducing pollution of blue resources, and create new clusters of economic activity for uplifting livelihoods of the local communities. While the Ministry of Maritime Affairs (MOMA) is working on developing a detailed roadmap in consultation with domestic stakeholder and international development partners, the biggest challenge to achieving a sustainable blue economy will remain the lack of financial resources.



Key to dealing with the financial constraints will be to tap into the global green financing instruments. There has been a significant increase in the global sustainable bond issuances in the last five years, with the market estimated at close to US\$ 1 trillion by 2021 and making up 10% of the global bond assets. The sharp increase in demand for sustainable bonds is driven by the Paris agreement with nations targeting to limit global warming to 1.5°C relative to preindustrial levels by 2050. This will require US\$ 3.5 trillion annually in investment, according to a 2018 estimate by the Intergovernmental Panel on Climate Change.

China and India have taken the lead in terms of issuance of global sustainable bond with estimated US\$ 12 bn raised till 2020. The sovereign issuance has been slow at US\$ 2 bn, while the remaining amount has been issued by the corporate entities. In India, the corporate sector raised nearly US\$ 7 bn through ESG and Green bonds in 2021, compared to \$1.4 bn in 2020. The issuance of green bonds has attracted stronger bids, larger order books, increased pricing leverage and a higher quality investors base. All of this has led to lower average cost of debt as compared to conventional bonds. The corporate sector issuances were led by the power sector JSW Hydro, Greenko, ReNew Power, Adani Mumbai, and Adani Green. However, these issuances were not limited to the power sector and include financial services, cement manufacturers and transport companies. Pakistan issued its first green bond in 2021, with WAPDA raising US\$ 500mn for a hydro power project.



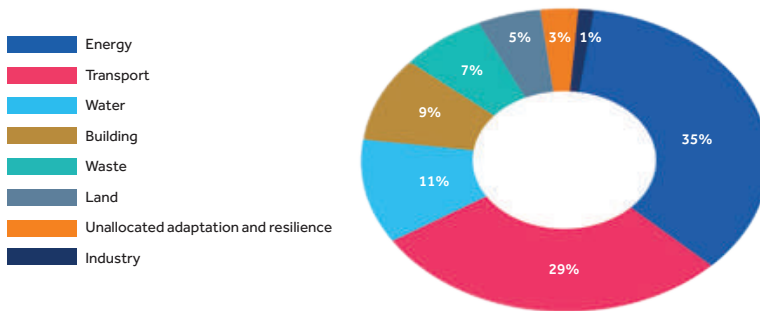
The blue economy has lagged in terms of tapping the growing pool of Environmental, Social and Governance (ESG) funds. Previously seen as the frontier of ESG investing, ocean-related economic opportunities are gradually becoming more mainstream²⁶. Renewable energy is leading the way, offshore wind power plants are growing in Europe and opportunities are growing in newer areas such as tidal energy, wave energy and ocean thermal conversion. Oslo-based seafood producer, Grieg, raised 1bn NOK in 2020 through a floating rate green issue that explicitly targeted improved and sustainable salmon aquaculture.

26 ESG CLARITY. 2021. Investing in the blue economy - ESG Clarity. <https://esgclarity.com/investing-in-the-blue-economy/>.

Looking at the emerging markets issuance of sustainable debt, the power sector leads the way with 35% of all funds raised²⁷. It is followed closely by the transport sector 29% with a significant shift towards more fuel-efficient transport (trains, motorcars, ships and airplanes). SNCF Group is the rail industry's leading issuer of green bonds with issuances of € 5.7 bn. A.P. Moller-Maersk A/S, the world's biggest container-shipping company, has issued its first ever green bond of US\$ 566 mn in 2021 for methanol fueled vessels.

Investments in water infrastructure for improving quality and efficient use of resources accounted for 11% of the emerging market green bond issuances. The focus of these projects is towards restoring ecosystems and aquifers by reducing pollution including dumping of toxic materials and towards wastewater management. The Republic of Seychelles launched the world's first sovereign 'blue' bond in 2018, proceeds from the bond will include support for the expansion of marine protected areas, improved governance of priority fisheries and the development of the Seychelles' blue economy²⁸.

Figure 11: EM Green Bond Issuance, by Use of Proceeds, 2012–2020 (%)



Source: (International Finance Corporation, Climate Bonds Initiative 2021)

According to OECD, the market for global sustainable debt is likely to rise sharply over the next five years. Emerging markets will need financial resources of US\$ 5 to 7 bn per annum to meet the COP 15 target of limiting global warming to well below 2 degrees Celsius, compared to pre-industrial levels. This will be a challenge for the resource constrained emerging markets and global sustainable bonds will become more critical to help meet these demands.

27 International Finance Corporation. 2020. Green Bond Impact Report. US: Corporation International Finance. https://www.ifc.org/wps/wcm/connect/5a9405c4-cfeb-42d2-889e-3a6c6eb48a26/IFC+FY20+Green+Bond+Impact+Report_FINAL.pdf?MOD=AJPERES&CID=nx64TV6.

28 World Bank. 2018. Seychelles launches World's First Sovereign Blue Bond. World Bank. <https://www.worldbank.org/en/news/press-release/2018/10/29/seychelles-launches-worlds-first-sovereign-blue-bond>.

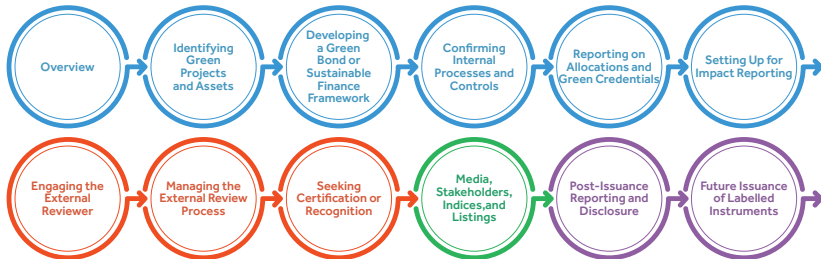
Figure 12: Financial Resources Required



Source: (OECD, Nature, IMF, IEA, BEIS, World Bank)

For Pakistan to take advantage of the growing appetite for global sustainable debt, a comprehensive institutional approach will need to be developed by the Ministry of Finance and the State Bank of Pakistan. While Pakistan tasted success in its first green bond issuance in 2021, there is a need to develop a larger pipeline by identifying green assets and scaling up capacity to meet the international standards. The IFC emission standards can act as a benchmark and help Pakistan meet the standards for external evaluation.

Figure 13: Process Flow for Issuance of Green Bonds



Source: (Asian Development Bank)

There have been no private sector issuances of green bonds and the policy makers need to encourage private business to adapt their business to meet the standards set for emissions under COP 15. SBP Green Finance guidelines need to be strengthened and implementation strategy rolled out for ESG investments. Developing a domestic 'green fund' facility will encourage the shift towards a more sustainable business environment. An environmental rating agency will help to differentiate businesses based on their emission standards and reward high achievers with lower capital charge (similar to credit rating agency).

Financial constraints are the major hurdles in the growth of blue economy. The world has also developed several solutions to handle this problem, for instance innovative financing for African blue economy and blended financial methods provided the solutions for financial constraints. Pakistan can learn and adopt the global and

regional best policies and practices where the countries have fostered their blue domain regardless of having poor financial conditions at home. Some excellent examples discovered by the research are Mauritius, Kenya, Bangladesh, Seychelles, and other nations throughout the African Continent (Ali & Iqbal 2021).

The study by Isola et al.2021 highlights the innovative sources of funding for blue economy such as, Blue Bonds, Debt Swaps, Crowdsourcing-Diaspora financing, Blended Finance, Development impact bonds, and contingently recoverable grant. Both Public and private sectors coordination is required to ensure the availability of financial and innovative funding.

According to Nature Conservancy (2019), for the conservation of blue economy, blue bonds are a prospect for coastal countries to reinvent in their natural resources by refinancing their natural debts in a system that safeguards funding for conservation of marine environment that can be fitted to benefit their Countries.

Banks can play a key part in this value chain with financial resources and technical capabilities required to develop green financing solutions for the domestic market. The Bank of Punjab is one of the first to introduce green financing solutions for business and households on solar energy, water treatment, solid waste management and Electric vehicles. BOP is also partnering with the Punjab Government for financing new green initiatives in the province by modernizing over 700 brick kilns to reduce emissions.

Key areas that need to be targeted for a sustainable blue economy is the upgradation of the existing ports and shipping infrastructure to meet the lower emission targets. As agreed under SDG 14, Pakistan needs to enhance coverage of protected marine areas to at least 10% of coastal and marine areas, consistent with national and international law. Similarly, there is an urgent need to promote sustainable fishing and aquaculture. All these investments can partially be addressed through global and domestic sustainable debt issuances.

CHAPTER 5: **SUSTAINABLE LIVELIHOODS**

Most of the communities living along the coastline are some of the poorest communities with limited access to basic services, with the only exception being the major coastal city of Karachi. The local communities' livelihoods are heavily dependent on fisheries as the primary source of income. There is an urgent need to encourage a shift towards more sustainable fishing practices but at the same time create employment opportunities in other sectors such as coastal and marine tourism and its allied services.

Sindh has a coastline of approximately 350 kilometers (km), a major portion of which comprises the Indus River Delta. The center of this highly fragile and rapidly changing ecosystem is the coastal areas of Thatta and Badin districts, consisting of eight sub-districts with a population of 1.2 million. Significantly reduced water flows in the lower Indus River resulting from longstanding upstream river water extraction have reduced the availability of water and increased saltwater intrusion in the river's lower reaches. This has resulted in a high level of environmental degradation, significant loss of agricultural production, a decline in mangrove habitat and loss of fish stocks.

The economy and livelihoods of these rural communities are directly tied to their immediate environment, which consists of mangrove swamps and creeks fisheries, subsistence agriculture & livestock and fish farming. Most of the communities live in abject poverty. ADB reports that 79% of the population is characterized as poor, while 54% of these communities are in the poorest of the poor category. Almost 90% of the residents live in reed shacks in scattered settlements having no amenities.

This resource and service scarcity has the greatest effect on women and children. Average literacy rates in 2014 were 47% for men and 14% for women²⁹.

Most of this population is unbanked and lack access to credit facilities. Community based development opportunities can be enhanced through credit facilities provided by the microfinance institutions. Studies show that coastal communities have benefitted significantly through access to microfinance facilities leading to increase in assets and income³⁰.

To support the outreach of the microfinance institutions, the Federal Government has recently launched the Kamyab Pakistan program. This program targets micro lending to individuals with banks providing capital to microfinance institutions to lend further to the unbanked communities. The micro loans are offered on concessionary rates for setting up of business, purchase of assets, house building and vocational training purposes. The coastal communities, like other marginalized communities can benefit greatly from these subsidized schemes.

The local communities can also benefit greatly from development of coastal tourism facilities and infrastructure. World Travel and Tourism Council report shows that tourism accounts for 1 of every 5 new jobs created worldwide and is one of the fastest growing sectors of the world economy, outstripping growth in manufacturing and other services industries. The growth in the Kerala tourism industry has led to the creation of over 1.4 million new jobs for the local communities and today the tourism sector employs over 23% of the total work force in the state.

Banks can also play a key role financing development of hotels and restaurants along the coastal belt for the private sector. The government can promote the development of these tourist facilities through encouraging Public Private partnerships (PPP). The government of Sindh and Balochistan can learn from the Kerala example. The government of the Kerala state has deployed the PPP mode for construction of hotels, building infrastructure (roads, bridges, and airports) and for marketing the state as a global tourism destination.

29 Asian Development Bank. 2014. "Pakistan: Sindh Coastal Community Development Project (formerly Sindh Coastal and Inland Community Development) Project Number 37188." <https://www.adb.org/projects/37188-013/main>.

30 Ahmed, Israr, and Imamuddin Khoso. 2020. "The Impact of Micro-finance on Self-employment and Poverty Reduction: A case of Sindh Rural Support Organization and Tameer Micro Finance Bank, Sindh." *Revista Amazonia Investiga* 18-27. doi:10.34069/ai/2020.32.08.2.

CHAPTER 6:

POLICY RECOMMENDATIONS

New Regulatory and Accounting Framework A robust institutional and accounting framework is needed to collect accurate data for estimating the blue economy and ensuring enforcement of relevant laws. A panel constituting a group of experts should be made in order to identify growth oriented sectors/ sub sectors under the purview of blue economy. Periodical studies on specific sectors and scientific collaborations will be crucial to make informed decisions.

Spatial Planning of Marine and Coastal Economy In order to make informed and coordinated decisions regarding using marine resources sustainably, use of geospatial mapping is required to get a comprehensive picture of a marine area. An expert group should be tasked to set clearly defined goals and targets of spatial planning. The body will also be responsible for achieving integration between various sectors of the blue economy. A detail survey and manpower audit of the Mercantile Marine Department (MMD) is needed to detect the issues in capacity and required up-gradation to fulfil its functions.

Use of Latest Technologies for Sustainable Marine Fisheries Ministry of Maritime Affairs (MoMA) needs to take some effective initiatives related to the value-addition of fishery products as our fish export price is low in the region. Fisherman should be provided the support and education (Capacity building) regarding fish preserving methods. Use of dedicated satellite system for regulation and management of fisheries is required.

Public Private Partnerships The government should motivate the private sector

for investment and to start a public-private partnership like India's example of Kerala state and provide some tax exemptions to promote coastal tourism in Pakistan.

Inclusive Financing Facilities and Effective Marketing Government should work with State Bank of Pakistan (SBP) to assist communities associated with fisheries, with a provision of incentives and interest-free loans through micro-finance to enhance the development of the fishing sector. It is recommended to use automated/electronic systems for traceability of consignments and auctioning systems. The same can be deployed to enhance efficiency in value chain development and marketing.

Port Development and Shipbuilding Special Maritime Industrial Zones are needed to be developed with the installation of latest digital technologies. A comprehensive plan is needed to be formulated and implemented to boost shipping and shipbuilding sector. It is recommended to ensure sustainable development of coastal areas. The ports and ships should be made environment friendly. Ports should be equipped with latest technologies.

In Pakistan, the local boat industry is functioning with lack of government support and its competitiveness is weak in the region. (Moazzam 2012) highlights that most registered boats in Pakistan have dual registration for Pakistan and Iran, which is a security threat for Pakistan. Ministry of Maritime Affairs need to intervene and have to take action for the security of Pakistan.

Sustainable Financing for the Blue Economy The major issue in financing is the accurate estimation of the investment needs of governments and communities and on the other side, investment willingness of entrepreneurs, investors and businesses. They need to be systematically networked to initiate an integrated agenda for the development of the blue bonds. The government should motivate the private sector for investment and to start a public-private partnership and tax exemptions.

Enhancement of Industry-Academia Linkages There is a need to establish a network of researchers, industry stakeholders, government personnel, and media outlets to create and disseminate awareness and education regarding the potential and prospects of blue resources. Awareness campaigns and mainstreaming and dissemination of the information produced by researchers for massive awareness will be useful.

Technology Development for Exploration and Deep Sea Mining A substantial focus is required for the technology enhancement in order to upgrade exploration and deep sea mining. As many precious resources pertaining to energy, fishing, marine aquaculture and others lie under water. Hence, for their effective mapping under water and sustainable extraction, an advanced technological setup is needed to be put in place.

Establishment of Development Fund The collaboration of different relevant stakeholders, private and public financial and research institutions are pivotal for blue growth in Pakistan think tanks like SDPI with Bank of Punjab and with other Government and private institute needs to work together for the growth of blue economy of Pakistan. The fund mobilization from stakeholders in Public Private Partnership ventures would facilitate in ship building, ship repair, maritime infrastructure, cruise terminals etc.

Blue Diplomacy It is crucial to safeguard the country's interests in the Indian Ocean. In order to maintain its smooth access to its Exclusive Economic Zones, and ensure safety of its territorial integrity, the country needs to maintain working relations with the neighboring countries. Effective use of diplomatic channels can go a long way in this regard.

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