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The Blue Economy: What Every MBA Needs to Know

Executive Summary

Oceans affect companies in nearly every industry and represent a promising frontier for business growth and innovation in the 21st century. Their importance to business ranges from their critical role in global supply chain transport to supporting energy, food production, and tourism industries that conservatively contribute more than $2.5 trillion to the global economy.[i] At the same time, acidification, overfishing, coastal development, and plastic pollution put at risk much of the economic benefit that oceans provide.

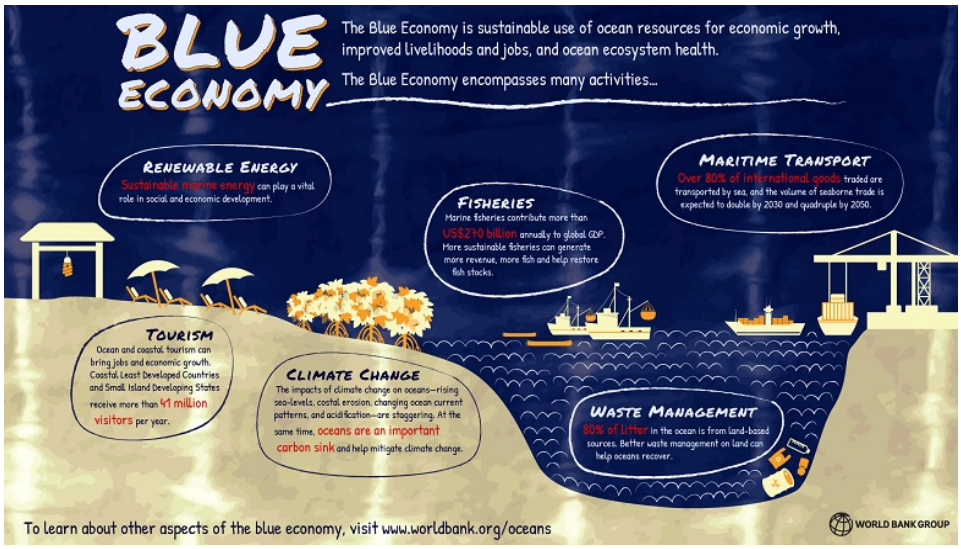
The "Blue Economy"—sustainable use of ocean resources for economic output—represents a large and growing business opportunity in industries like offshore wind, marine biotech, AI, aquaculture, and shipping decarbonization. A recent investor survey by Credit Suisse summarized: "The sustainable Blue Economy is poised for an increase in importance over the coming decade, with over a third of investor respondents seeing it as amongst the most important topics in 2030."[ii]

"The transition from the current short-term, destructive approach to ocean assets towards a more sustainable, climate-secure Blue Economy presents a tremendous economic and sustainable investment opportunity."

Marisa Drew
CEO, Impact Advisory & Finance (IAF) Department, Credit Suisse

Investors and the Blue Economy, Credit Suisse, 2020 www.credit-suisse.com/media/assets/microsite/docs/responsibleinvesting/spread-blue-economy-report.pdf

Oceans will also play an important role in addressing the world's biggest challenges, including food security, climate change, and economic development in coming decades. Capturing these opportunities while restoring the health of our oceans is a critical challenge. Businesses, governments, investors, and NGOs can be active partners in creating models that promote social equity, ecosystem health, and economic opportunity.



Source: World Bank Group
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The Blue Economy is diverse and intersects with many industries, including land-based ones. Swift changes in marine environments, ocean policy, or consumer sentiment can have far-reaching implications for businesses and investors. MBAs thinking today about the important issues of the next decade should closely track Blue Economy trends and opportunities.

The Issue

Oceans cover more than 70 percent of the planet's surface, produce over half of the planet's oxygen, and support the livelihoods of an estimated 650 to 800 million

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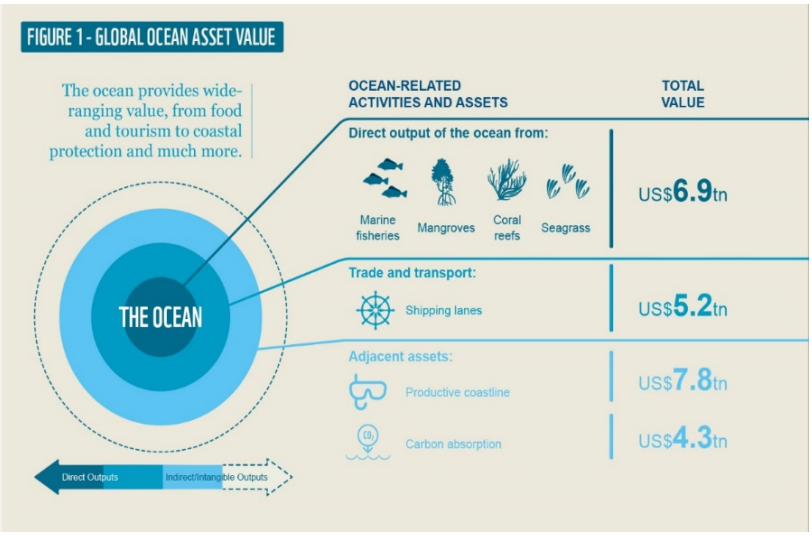
people globally. Marine fishing and aquaculture produce about 15 percent of the animal protein consumed by 4.3 billion people.[iii] Together, ocean-related industries—including shipping, ports, fishing, oil and gas, renewable energy, tourism, marine biotechnology, and related industries—contribute over $2.5 trillion to the global economy annually, equivalent to the world's 7th largest economy.[iv] At the same time, ocean health is under threat. Overfishing, marine pollution, coastal development, and the effects of climate change are threatening the sustainability of the ocean ecosystem as well as those industries that depend on the oceans.

Investors, nonprofits, governments, and companies see an opportunity to address these challenges and capitalize on ocean resources simultaneously by investing in the Blue Economy. As the World Bank defines it: "The Blue Economy is the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health."[v] Collectively, the Blue Economy is expected to expand at twice the rate of the mainstream economy by 2030.[vi]



Source: World Wildlife Fund, Reviving the Ocean Economy, 2015.

The global COVID-19 pandemic has significantly disrupted ocean-related industries, resulting in losses in global shipping, fisheries, and ocean tourism. While these impacts are painful in the short-term, there are growing efforts to direct stimulus funding toward efforts that enhance a "blue-green" recovery. Decisions about the use of stimulus funds will have long-term consequences for ocean industries, communities, and ocean health.

Threats

Ocean health is essential not only to marine and coastal industries, but to land-based industries as well, since global supply chains, energy and food production all rely on healthy, secure, and well-regulated oceans.

Concurrent challenges threaten ocean health and have the potential to reshape industries in dramatic ways in coming decades:

- Ocean acidification. As carbon dioxide emissions go up, the ocean absorbs increasing levels of carbon dioxide, which turns to carbonic acid and increases ocean acidity, threatening the stability of marine ecosystems. Fifty percent of the world's coral have disappeared to date; at the current rate of temperature rise, coral reefs will disappear by 2050[vii], with disastrous implications for tourism, biodiversity, and ecosystem health.

- Rising sea levels and decline in coastal resilience. Climate change is driving two additional issues that threaten coastal communities: rising sea levels (due to melting Arctic land ice and thermal expansion) and an increase in the strength and severity of storms like hurricanes and typhoons. In the U.S., 40% of the population (126 million people) live in coastal counties[viii] that could be affected by rising sea levels and coastal storms.

- Loss of fish stocks. To date, about 34 percent of all fish stocks are overfished and about 60 percent are fully exploited.[ix] Ocean warming has added to the problem of overfishing by causing habitat decline and migration of species to new regions. The decline of fish stocks has significant implications for global food supply and economic livelihoods, as well as for the health of the ocean food chains and habitats.

- Plastics & other pollution. More than 8 million metric tons of plastic enter the ocean each year.[x] At the current rate of expansion, there will be more plastic in the ocean than fish by 2050.[xi] While plastics are perhaps the most visible pollution problem, ocean health is also degraded by agricultural runoff (eg,

fertilizers), wastewater, oil spills, and other pollution affecting the chemical and nutrient balance of the ocean.

Mitigating ocean threats will hinge not only on better stewardship by ocean stakeholders, but also on more robust governance. There is a need for more comprehensive and effective governance policies, especially in areas beyond national jurisdiction, to address a wide range of complex issues, including the security of shipping routes (for instance, Arctic infrastructure and routes), expanding economic activity (including deep seabed mining), protecting ocean resources, adapting to climate change, and restoring fragile ecosystems.

Business Risks

The sustainability challenges facing the world's oceans present several potential risks to today's businesses, with exposure varying by industry.

Physical asset risks
Rising sea levels and increasing storms directly threaten business assets in coastal cities—including commercial and residential real estate, tourism, and transportation infrastructure. As a case in point, a 2020 study by McKinsey & Co. projected that Florida real estate will be devalued by 15-35% by 2050 due to flooding and sea level rise risk.[xii] Coastal resilience is important not just for the local communities but for also for supply chains. Coastal tourism industries face particularly high-risk exposure. Caribbean countries lost over $1 billion in tourism revenue after Hurricane Maria in 2017 (not including the costs to rebuild).[xiii]

Reputation risk
Consumers increasingly expect companies to be good stewards of environmental resources, and headline-making crises like marine plastic, oil spills, and ocean pollution have led consumers and NGOs to put pressure on companies. A study of 1,664 companies in 16 sectors by One Ocean Foundation found that "51% of companies are aware, albeit to varying degrees, of the potential pressures of their industries on the ocean, while 44% of them deploy some kind of mitigating activities."[xiv] In 2019, companies like Unilever, Heineken, and Mattel (among many others) made commitments to reduce the use of plastic in their packaging in response to a groundswell of consumer concerns about ocean plastic and a global #PlasticFree social media campaign.

Supply risk
Depletion of fish stocks, combined with declining ocean ecosystem health, threatens supply volatility for industries that sell fish or ocean products, as well as the livelihoods of the local communities that depend on fishing. Separately, expected increases in hurricanes and typhoons may mean an increased likelihood of supply chain disruptions for businesses that rely on shipping and coastal ports for their supply chains.

Access to capital
ESG investing (investing that incorporates environmental, social, and governance risks) is currently growing almost three times as fast as non-ESG investing.[xv] While assessing portfolios specifically for ocean risk exposure is not widespread yet among investors, it is a potential area of focus for ESG investors in the future.

Deep seabed mining: Blue Economy risk or opportunity?

The next frontier in mining is the ocean seabed, a repository for metals like nickel, cobalt, copper, and rare earth minerals. Companies like De Beers and Nautilus Minerals are already working in coastal waters in some countries, and are seeking to expand into international waters. This is a large potential market that could supply important materials—many of which are needed for batteries and electric vehicles in a low-carbon economy—but one that could have significant environmental consequences for the ocean. How regulation is structured and how companies set up their mining operations will determine whether deep seabed mining can be done in a sustainable way.

Further reading: "History's Largest Mining Operation Is About to Begin," The Atlantic, Jan./Feb. 2020.

Business Opportunities

In coming decades, oceans will play an increasing role in economic growth, development, and innovation. As interest in Blue Economy opportunities has grown, maritime-focused incubators and innovation hubs have emerged—such as Techstars' Eastern Pacific Accelerator (Singapore), Katapult Ocean (Norway), PortXL (Netherlands), TMA Blue Tech (US) and SeaAhead (US), among others. Many of these organizations have launched in the last 5 years, as regions see an opportunity to accelerate growth of their ocean-based economies.

Below are a few of the industries poised to grow as part of the Blue Economy.

Blue Economy Growth Markets

- Shipping & marine transport decarbonization & energy efficiency technologies
- Electric marine craft
- Marine mapping, data & intelligence
- Offshore renewable energy
- Sustainable / regenerative aquaculture
- Sustainable fishing technologies
- Plastics alternatives / biodegradable packaging
- Ocean waste cleanup
- Eco-tourism / regenerative tourism
- Blue economy finance / venture capital
- Carbontech / ocean carbon sequestration
- Coastal reforestation / natural infrastructure for coastal resilience
- Marine biotech

Shipping and marine transport decarbonization
More than 90% of international commerce is transported by the sea[xvi]. Along with that, comes a carbon footprint of 2.5% of the world's carbon emissions.[xvii] Growing climate change concerns are prompting marine transport companies to invest in reducing emissions. Lenders are also leaning on the shipping industry; the Poseidon Principles, signed by banks including Citi, ING, and Credit Suisse, lay out a framework for disclosing climate impacts of financial institutions' shipping portfolios.

Shipping giant Maersk announced a goal in 2019 achieving net-zero carbon emissions from operations by 2050. The industry's push creates an estimated $1 trillion market opportunity for both ship-related decarbonization investments (engines, on-board energy storage, and energy-efficiency technologies) and land-based investments (low-carbon fuels, storage, and bunkering infrastructure).[xviii] Meanwhile, startups like MarineAi and Cubex Global are aiming to make shipping more efficient with information technology solutions. Other companies are investing in fully electric marine craft and engines (see, for example, Norway's Evoy).

Marine mapping, data, and intelligence
Big data and AI present some of the most interesting applications to solving ocean sustainability challenges, and a host of players are working on technology applications. For instance, Microsoft is working with The Nature Conservancy to develop geospatial analysis tools for coastal resilience planning. Satellites are being used to detect plastic waste in the ocean, while solar-powered ocean drones on the water's surface are collecting data for environmental monitoring and underwater robots are picking up materials from the ocean floor for biotech research.

Offshore energy
Offshore wind—well established in Europe; nascent but growing in other regions—is an established market, sized at $24 billion in 2019 and is anticipated to grow at over 14.8% compound annual growth rate between 2020 and 2026.[xix] As global demand for carbon-free energy surges, other offshore energy technologies are also interesting markets for investors. For instance, see startup Sinn Power's wave energy platform and ORPC's undersea turbine technology.

Aquaculture
Aquaculture (the farming of fin fish, shellfish, oysters, and mussels, whether in tanks on land or in containment areas in the ocean) has grown significantly since the 1980s and is an important lynchpin in increasing the supply of fish for consumption as natural fish populations plateau or decline due to fishing. One analysis estimated the aquaculture market at $169 billion in 2015, with a projected growth rate of 5.3% per year.[xx]

Interest is growing in improved technologies for aquaculture (see *Forbes* article "5 Innovations in Aquaculture Worth Catching On To Now") and in "regenerative aquaculture"—fish farming that can improve rather than degenerate the surrounding environment (for example, see GreenWave's polyculture farming system). Other companies are looking at new markets for sustainably farmed kelp—for instance, Oceanium's seaweed-based packaging, Akua's kelp jerky, and Atlantic Sea Farms's kelp kimchi.

Sustainable fishing
The problem of overfishing is compounded by factors including illegal fishing, poor monitoring and reporting, misidentified fish, and wasted "by-catch". Companies are investing in new technologies to solve these challenges—solutions that range from physical tech (like SafetyNet Technologies' illuminating net devices) to software applications (like Fishcoin's blockchain technology for traceability in the seafood supply chain). Events like an annual "Fishackathon" drive new technology applications to sustainable fishing challenges.

Plastic alternatives (circular economy products & services)
Ocean plastic waste is a highly visible problem that has captured consumer attention and driven companies to look for alternatives to plastics in products and packaging. These range from the obvious (reusable grocery bags) to the bizarre (like swimwear made from recycled McDonald's straws). The circular economy (in which products are recycled or reused rather than taking a linear path from production to landfill) is a focus in nearly every industry right now. Markets are expected to grow for: new plastics upcycling technologies, biodegradable packaging, reusable products and services that eliminate packaging altogether, alternatives to single-use plastic products, and ocean waste cleanup solutions.

Marine biotechnology
Much of the oceans' plant and animal life is still only just being discovered, and many countries and investors see significant potential in developing biotechnology compounds and processes from marine resources. Marine biotech (or "blue biotech") has captured investors' interest for potential applications ranging from biofuels to genetically modified fish, nutraceuticals, cancer treatment drugs, and even cosmetics.

Carbon sequestration & coastal resilience
Coastal ecosystems like mangrove forests and salt marshes play an important role in sequestering (removing) carbon and protecting coastlines from storms, tidal surges, and erosion. Investment in natural infrastructure and coastal reforestation will increase as mitigating climate change becomes a larger global priority. Investment may come from governments, companies looking to offset their carbon emissions, or innovative public-private partnerships like the world's first coral reef insurance policy.

Blue Economy finance
Expect to see more attention from investors in the Blue Economy in coming years. Funds like the Althelia Sustainable Ocean Fund, Aquaspark, and Ocean 14 Capital are starting to appear, making investments in technologies that support sustainable aquaculture and marine ecosystem restoration. Some countries are experimenting with offering "sovereign blue bonds" to support restorative ocean projects. And large banks are signaling their interest in the space by joining the voluntary Sustainable Blue Economy Finance Principles.

Takeaways for MBAs

1. Ocean industries generate $2.5 trillion in gross value added to the global economy each year, and many industries are growing faster than the global economy.
2. The Blue Economy presents compelling opportunities for innovation and investment in emerging technologies like marine biotech, marine data & intelligence, aquaculture, plastics alternatives, shipping decarbonization, and renewable energy.
3. Ocean sustainability challenges like acidification, plastic and nutrient pollution, ocean warming, sea level rise, and biodiversity loss have significant operational and reputational risks for many companies—even those not directly involved with marine industries. Solutions to these problems will be increasingly valuable in coming decades.

Further Reading

Investors and the Blue Economy, Credit Suisse and the Responsible Investor, 2020.

Investable Oceans

Ocean Finance Handbook, Friends of Ocean Action, 2020.

Business for Ocean Sustainability, Second Edition – A Global Perspective, One Ocean Foundation, 2020

A Sustainable Ocean Economy in 2030: Opportunities and Challenges, The Economist Group World Ocean Initiative, 2020.

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