

SUSTAINABLE SHIPPING



What it is and why it matters

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TABLE OF CONTENTS

- 1** What is Sustainability?
- 2** Why does Sustainability matter?
- 3** What is the impact of shipping?
- 4** How does the maritime industry move forward?
- 5** References

WHAT IS SUSTAINABILITY?

Sustainability is the objective of ensuring long-term harmonious human existence on Earth. Sustainability revolves around a straightforward concept: our survival and well-being are intrinsically linked to the environment, with all our necessities stemming either directly or indirectly from nature. The essence of embracing sustainability lies in establishing and upholding an environment where humans and nature can live together in a mutually beneficial balance, thereby ensuring the well-being of both current and future generations.

Sustainability is commonly characterized as encompassing three interconnected aspects (or dimensions): environment, economic, and social. Most emphasis has been placed on the environmental dimension as it is considered the foundation for the other two dimensions. Sustainable development, which lies at the intersection of the three dimensions, is the primary objective as outlined by the United Nations' 17 Sustainable Development Goals [1].

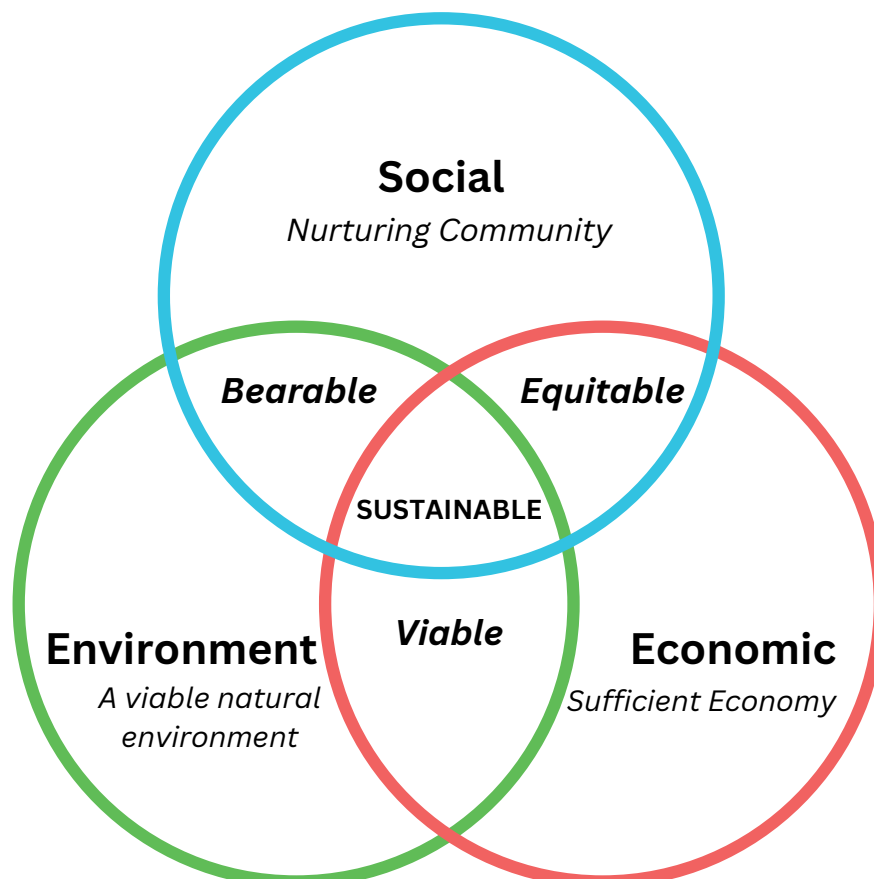


Fig 1. Sustainability Dimensions: Environment, Economic, Social [2]

WHY DOES SUSTAINABILITY MATTER?

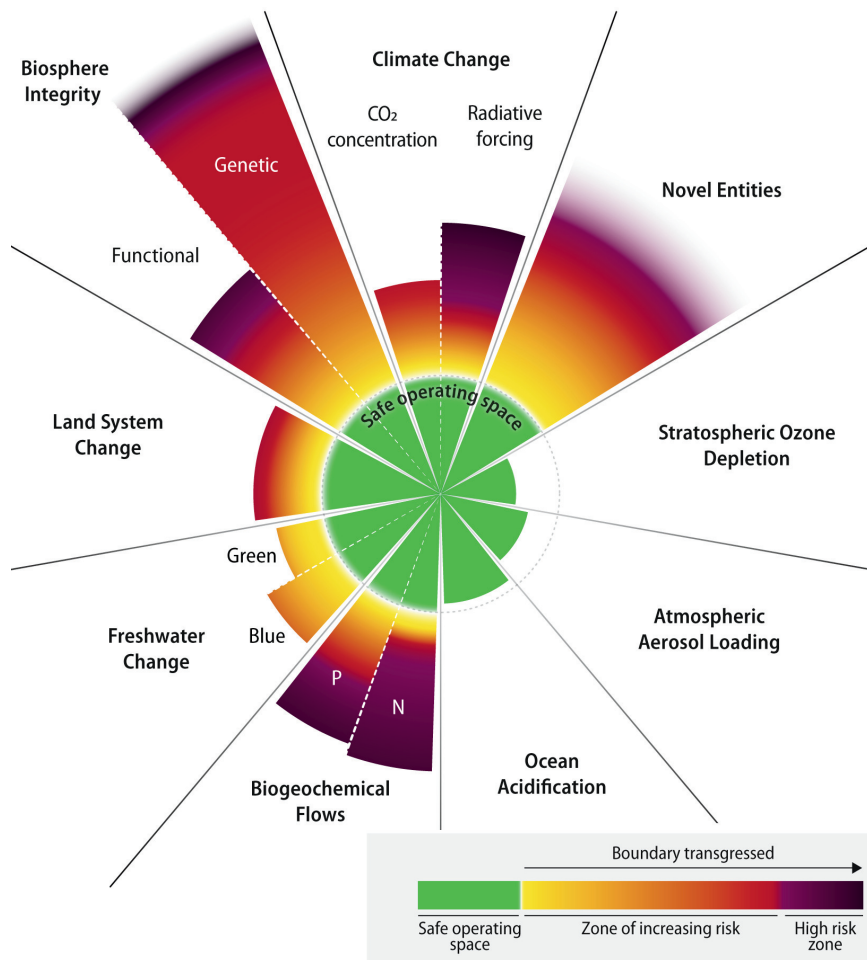


Fig 2. Status of Nine Planetary Boundaries [3]
(figure reproduced with permission)

Sustainable development is essential to maintain a scientifically grounded safe zone for humanity that preserves the Earth's present condition and its ability to recover and adapt. Using the planetary boundaries framework that identifies nine vital processes necessary for the stability and resilience of the Earth system overall, a recent study has shown that six out of the nine boundaries are beyond the safe operating space for humanity.

The United Nations describes the triple planetary crisis as the three main interlinked issues that humanity currently faces: climate change, pollution, and biodiversity loss [4]. Each of these challenges arises from distinct causes and yields specific consequences, and addressing each one is imperative to securing a sustainable future on Earth.

Climate change represents the most urgent challenge humanity is dealing with today. At its core, climate change is about the long-standing changes in temperature and climate behavior that eventually will lead to a total transformation of the ecosystems on which life on Earth relies. Air pollution stands as the leading contributor to illness and early mortality globally.

Biodiversity loss denotes the reduction or vanishing of various forms of life, encompassing species like animals, plants, and the ecosystems they inhabit. Human activities are the main drivers of the triple planetary crisis including emissions released from energy use (e.g., greenhouse gases (GHGs) and air pollutants), overfishing and habitat loss (e.g., deforestation and desertification) [3].

WHAT IS THE IMPACT OF SHIPPING?

Transporting goods by sea is significantly more carbon-efficient compared to road, rail, or air transport. Nonetheless, due to the vast scale of international trade, the maritime shipping sector is responsible for around 3% of global GHG emissions that contribute to global warming [5].

In addition to GHG emissions, ships also emit air pollutants that impact human health including sulfur oxides (SO_x), nitrogen oxides (NO_x), and particulate matter (PM). Although the International Maritime Organization (IMO) has put into effect regulations to reduce emissions of air pollutants from ships, such as NO_x emissions and the sulfur content in fuels, air pollution persists as a concern. This is because premature fatalities, including those from cardiovascular diseases and lung cancer, along with instances of childhood asthma, are still linked to emissions from maritime shipping [6].

The impact of shipping on biodiversity is highlighted by the ongoing challenge of stopping the introduction of invasive species via ballast water and hull fouling, which has been identified as the dominant source of marine bioinvasions. [7] Other biodiversity challenges include collisions with marine life such as whales, underwater noise affecting marine mammal communication, and ship discharges and spills impacting the marine environment.

A recent report used as the foundation for a new initiative, 2030 Shipping Pact for People and Nature, summarized the main threats, risks, and impacts of shipping to people, ecosystems, and nature [8]. The report described the relationships between shipping activities, their impacts, and associated drivers of biodiversity loss. The four main drivers (climate change, change in land and sea use, pollution, and invasive species) are closely aligned with the concerns identified by the triple planetary crisis.

In similar fashion, the World Shipping Council has outlined five focus areas of sustainable shipping: climate action, reducing air emissions, stopping invasive species, protecting marine life, and responsible recycling and waste management [9].

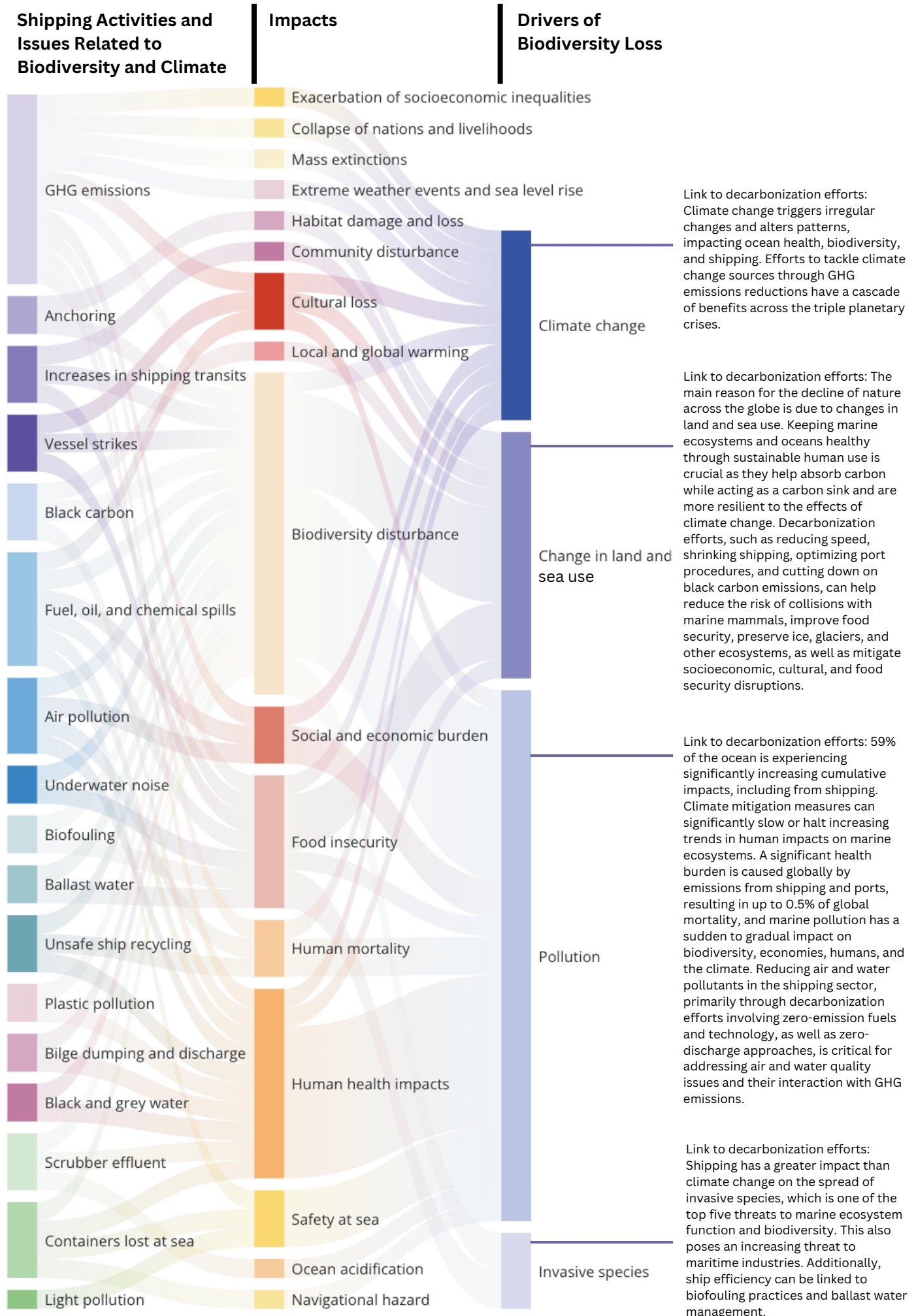


Fig 3. Shipping threats, risks, and impacts to people, ecosystems, and nature [8] (figure reproduced with permission)

HOW DOES THE MARITIME INDUSTRY MOVE FORWARD?



Accelerate Maritime Decarbonization

Maritime decarbonization has grown to become one of the biggest challenges the maritime industry is currently addressing. This was highlighted in July 2023 at the IMO Marine Environmental Protection Committee (MEPC) 80 meeting where its GHG strategy was revised, aiming for net-zero emissions by 2050, setting interim targets, and proposing measures. Organizations such as the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping and Global Centre for Maritime Decarbonisation are dedicated to this maritime decarbonization challenge. With climate change representing the most urgent challenge humanity is dealing with today, these current and future initiatives to accelerate maritime decarbonization are critical to achieve sustainable development.



Adopt Sustainable Shipping Initiatives

However, at the same time, the industry should avoid “carbon tunnel vision” [10] and remain diligent in addressing all aspects of sustainability. The Sustainable Shipping Initiative has developed a roadmap to a sustainable shipping industry that consists of six vision areas – Oceans, Communities, People, Transparency, Finance, and Energy [11]. The roadmap emphasizes not only the objective to achieve decarbonization by 2050 but also focuses on various other elements. These include the growing demand and pressure from investors, banks, and other financial parties for enhanced sustainability metrics and transparency in reporting, as well as the labor and human rights challenges confronting seafarers around the globe.



Aligning Efforts

Although sustainability encompasses a wide range of issues, the considerations specific to the maritime industry are familiar. Adopting a comprehensive outlook and grasping the overarching context is crucial for aligning the efforts of organizations, companies, or individuals with the objective of meeting sustainable development goals. This alignment is essential to guarantee the preservation of our planet for future generations.

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SNAME SUSTAINABILITY PANEL EC-16

The purpose of the Sustainability (EC-16) Panel in SNAME is to provide a forum for broad-based discussion of sustainability in the maritime industry - including alternate fuels, decarbonization, greenhouse gases, green corridors, environmental, social, and corporate governance (ESG) and any emerging sustainable technologies including carbon capture. It is also to provide technical support for the development of appropriate policies and practices promoting sustainability.

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