### **OPPORTUNITY**



Technology, Nature

#### MEGATRENDS

Advanced Health and Nutrition

#### TRENDS

Biomaterials Biotechnology Blue Economy Food Innovation

#### SECTORS IMPACTED

Agriculture & Food Chemicals & Petrochemicals Consumer Goods, Services & Retail Data Science, AI & Machine Learning Education Financial Services & Investment Government Services Health & Healthcare Logistics, Shipping & Freight Manufacturing Materials & Biotechnology





## What if oceans unlocked innovations in health and food?

# AQUATIC BREAKTHROUGHS

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Oceans, with their vast unexplored biodiversity, offer opportunities in marine biotechnology and pharmacology, enabling advances in medicine and food industries.

By 2030,

climate-related health issues, such as malnutrition, malaria, diarrhoea, and heat stress, could cause

### **250,000** extra deaths annually

### WHY IT MATTERS TODAY

As global temperatures rise, ecosystems and disease landscapes shift. New wildlife species migrate north, while novel pathogens emerge, affecting everything from Arctic mammals to plants worldwide.<sup>332</sup> This ecological transformation signals a risk of unpredictable pandemics in a warming world.<sup>333</sup>

While more socially inclusive research covering a wide range of infectious diseases is needed for a better understanding of the impacts of climate change,<sup>334</sup> by 2030 climate-related health issues, such as malnutrition, malaria, diarrhoea, and heat stress, could cause 250,000 extra deaths annually with health-related costs possibly reaching up to \$4 billion each year.<sup>335</sup> Developing countries with fragile health systems are especially vulnerable.<sup>336</sup>

As the global population is predicted to grow to 8.5 billion by 2030 and 9.7 billion by 2050,<sup>337</sup> the need for effective, safe, and better treatments and drugs in response to evolving infectious and non-infectious diseases will be needed. In addition to climate shifts impacting on infectious diseases, by 2050 non-infectious diseases like heart disease, cancer, diabetes, and respiratory conditions will constitute 86% of the annual 90 million deaths – a 90% rise from 2019 figures.<sup>338</sup>

By volume, the oceans represent 99.5% of the Earth's biosphere,<sup>339</sup> and an estimated 80% of the planet's biodiversity calls the ocean home.<sup>340</sup> With an annual economic value estimated at \$2.5 trillion, ocean-linked sectors, or the 'blue economy', are equivalent to the world's seventh largest economy.<sup>341</sup> However, only 5% of the oceans have been explored.<sup>342</sup>

### OPPORTUNITY

From fish traversing the open sea to sea snails nestled in coral reefs and the smallest microbes on the ocean floor, the oceans offer countless opportunities for scientists to discover the potential of marine biotechnology.<sup>343</sup> The marine environment, rich in unique microorganisms, offers vast potential for bioactive chemicals with applications in food processing.<sup>344</sup> Pharmacological research on marine organisms is largely untapped, presenting a vast, diverse source of new drugs for diseases like cancer and malaria.

The marine ecosystem, abundant in aquatic flora and fauna, is explored for insights and learnings related to their antibacterial, immunomodulatory, antifungal, anti-inflammatory, anticancer, antimicrobial, neuroprotective, analgesic, and antimalarial properties<sup>345</sup> for practical applications.

### BENEFITS



Biotechnology discoveries support the health and well-being of people worldwide and create new economic opportunities. With more exploration of the oceans comes greater understanding and appreciation of the vital ecosystems that populate it, motivating sustainable blue economy technology and practice.

### RISKS

Overuse of marine resources damages ocean ecosystems, threatening livelihoods dependent on them. Discoveries require more comprehensive research to prove efficacy<sup>346</sup> and innovative strategies to ensure the sustainability of oceans and marine ecosystems.<sup>347</sup>

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The Global 50 (2024)



# Only 5% of the oceans hav been explored

The Global 50