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ENTREPRENEURSHIP AND YOUTH PARTICIPATION IN THE BLUE ECONOMY

IN YEMEN, THE GULF STATES, AND RED SEA COUNTRIES

Prof. Dr. Khaled Al-Najjar

Professor of Economic Geography and Dean of the Center for Environmental Studies at Taiz University

July 2025

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COMPREHENSIVE BACKGROUND PAPER

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01 Executive Summary

The sustainable Blue Economy represents a crucial strategic opportunity for Yemen, the Gulf States, and the Red Sea littoral states. While Gulf Cooperation Council (GCC) countries seek to diversify their economies away from oil dependence, the Blue Economy is a vital lifeline for livelihoods and food security in Yemen, and a key economic driver for the Red Sea littoral states. Youth in these regions possess immense potential to lead this transformation, driven by a growing awareness of sustainability issues and advanced digital skills.

Entrepreneurship, in its broad sense, is the spark that ignites innovation and economic development. It enables the development of new business models that not only focus on financial profit but also contribute to achieving social justice and environmental preservation. Consequently, youth entrepreneurship becomes a practical and effective mechanism for achieving comprehensive sustainable development. It offers innovative solutions to complex challenges, enhances economic diversity, and contributes to building a more sustainable and prosperous future for all.

The region is rich in opportunities for young entrepreneurs in the Blue Economy, in sectors such as sustainable fisheries, aquaculture, marine ecotourism, marine renewable energy, marine biotechnology, robotics, and data analytics. Regional and international case studies, such as the "Aquaventure" tourism initiative in Oman, and youth-led innovation centers and robotics projects in the United Arab Emirates (UAE), demonstrate how technological innovation can drive sustainable solutions with dual economic, social, and environmental impact.

Youth entrepreneurship in the Blue Economy in the region faces significant challenges, primarily centered on access to finance, relevant skills and training, supportive infrastructure, and inclusive decision-making platforms. A common denominator among the target regions is that the essential elements for successful entrepreneurship are often missing or difficult to access. These challenges are rooted in the broader economic and social environment; the conflict in Yemen has led to fragmented public institutions and a lack of national strategies and budgets, exacerbating economic instability and skill shortages. In the GCC countries and Red Sea littoral states, major challenges include a funding gap for small and medium-sized enterprises (SMEs), a lack of specialized expertise in advanced technical fields, and regulatory uncertainty. Banking sector preferences for large corporations, high collateral requirements, and traditional risk assessment models also hinder the growth of innovative youth-led SMEs. Conversely, shared environmental challenges provide a strong impetus for regional cooperation. Marine ecosystems know no boundaries, and their degradation in one area can affect neighboring areas. This interdependence necessitates a collective approach to environmental conservation, pollution control, and sustainable resource management, which can support collective stability and prosperity.

This paper is an in-depth study on ways to promote entrepreneurship and youth engagement in the Blue Economy. It provides a comprehensive analysis of the theoretical literature on the Blue Economy, aiming to understand its complexities and importance, as well as international, regional, and local contributions to its development. It provides a detailed analysis of the current status of youth entrepreneurship and youth participation in Blue Economy activities within selected regions, highlighting the most important specific and common challenges, as well as opportunities that

enabled the formulation of effective development initiatives. This paper also examines and documents best international and regional practices and initiatives aimed at maximizing the sustainable utilization of vast marine potential, identifies and evaluates case studies of pioneering and successful youth-led projects within the Blue Economy, and draws essential lessons from them to enhance youth participation in Blue Economy sectors. Additionally, this paper highlights the most important proposed pathways to strengthen youth participation in Blue Economy activities in the region, from idea generation to the implementation of sustainable projects.

The paper concludes by presenting strategic and practical recommendations that represent a comprehensive strategic approach for policymakers, youth leaders, and other stakeholders to create an enabling environment for full youth entrepreneurship and participation in the Blue Economy. These recommendations are based on four main pillars: (1) enhancing a supportive environment for marine entrepreneurship by building clear regulatory frameworks, expanding specialized business incubators and accelerators, and strengthening effective partnerships between the public and private sectors; (2) developing youth capabilities and skills through specialized educational and training programs that bridge specific skill gaps in technical and scientific fields, with a focus on experiential learning and mentorship; (3) providing innovative financing mechanisms that go beyond traditional banking restrictions, and utilize blue finance tools such as blue bonds and blended finance to reduce risks and attract private investment; (4) emphasizing the importance of regional cooperation as a pivotal factor in stimulating innovation and entrepreneurship.

The paper suggests ideas for potential initiatives, including establishing joint innovation platforms, developing a youth-led regional Blue Economy fund, knowledge exchange and capacity building programs, enhancing youth participation in regional ocean governance, and launching joint campaigns for marine environmental conservation. To maximize impact, the paper proposes several innovative projects that youth can adopt and implement locally and regionally in the fields of aquaculture, fisheries, marine technology, renewable energy, marine biotechnology, coastal protection, maritime transport and logistics, and sustainable marine tourism. In the field of policymaking, the paper provides a roadmap for enhancing youth participation in the Blue Economy across the region. Strategic investment in youth is a key to building a prosperous and sustainable future for the oceans and coastal communities in the region.

02 Introduction

The Blue Economy represents a massive global economic force. Its assets are estimated at $24 trillion, generating an annual economic value of $2.5 trillion. In addition to its role in providing food security for over three billion people, more than 80% of global goods can be transported across seas and oceans. Furthermore, and water bodies host submarine cables carrying 98% of international internet traffic. It directly and indirectly supports over 600 million jobs worldwide, making it equivalent to the world's eighth-largest economy (Deutsche Bank, 2024). This significant economic valuation provides a strong incentive for countries to invest in the Blue Economy. When combined with a focus on sustainability, economic growth in this sector can be viewed as both profitable and environmentally responsible. The comprehensive nature of the Blue Economy, which goes beyond mere exploitation of primary resources, requires an integrated approach to development that combines technological innovation and multi-sectoral cooperation to realize its full potential.

The sea is part of the history, culture, and lifestyle of coastal and marine populations in Yemen, the Gulf, and neighboring regions. It is a natural capital and an inherent resource of the environment. It represents a promising development approach as it offers investment opportunities spanning a wide range of productive sectors essential to supporting entrepreneurship and youth engagement in sustainable development. Despite this, youth entrepreneurship in the Blue Economy faces numerous challenges, most notably difficulty in accessing finance, lack of skills, and deteriorating infrastructure.

The theoretical and practical significance of this paper lies in its contribution to the research literature on the Blue Economy and highlighting the role of youth entrepreneurship as a driver for transforming challenges into investment opportunities. It provides strategic and practical recommendations for policymakers, youth leaders, and all stakeholders to enhance youth participation and entrepreneurship in the Blue Economy in Yemen, the Gulf, and the Red Sea littoral states. Therefore, this paper focuses on the symbiotic relationship between three main axes in the sustainable Blue Economy: Youth, Entrepreneurship, and Sustainable Development. It assumes that investing in youth empowerment through education, training, finance, and building a supportive environment is key to enhancing youth entrepreneurship and their effective participation in the Blue Economy. This vital engagement will contribute to achieving sustainable development of the Blue Economy, which in turn will translate into comprehensive development for the concerned communities and countries.

To achieve its objectives, this paper adopts a multi-faceted analytical and procedural methodology combining qualitative and quantitative approaches through conducting interviews with a targeted sample of (3) experts in the fields of Blue Economy and entrepreneurship across the region from Yemen, UAE, and Egypt, and selecting (6) successful youth-led entrepreneurial projects and initiatives in the Blue Economy (locally, regionally, and internationally) as case studies. A comprehensive collection and review of academic literature published in books and peer-reviewed scientific journals related to the Blue Economy and entrepreneurship were also carried out, relying on reports and statistics issued by international organizations, and utilizing information published on the official websites of relevant international and regional organizations and research.

03 Problem Statement and Significance of the Study

3.1 Problem Statement and Research Questions:

The economic potential of the the Blue Economy globally and regionally in enormous, with assets estimated at $24 trillion, generating an annual economic value of $2.5 trillion, and providing 600 million jobs, making it equivalent to the world's eighth largest economy. Despite this, countries in the region – especially Yemen, the Gulf States, and the Red Sea littoral states – face significant challenges that threaten its sustainability and limit its full utilization. In this context, youth entrepreneurship emerges as a powerful tool for innovation and a key driving force for achieving sustainable development in the region, but the existence of these challenges hinders growth and development. This necessitates an in-depth study to understand these challenges and opportunities, and to develop strategic mechanisms that empower youth entrepreneurship, to achieve sustainable exploitation of the Blue Economy's potential and comprehensive development for the region. Therefore, this paper seeks to answer the following main questions:

- What is the theoretical framework of the Blue Economy and its key concepts, and what is the extent of its contributions locally, regionally, and internationally?
- What is the current reality of youth participation in the Blue Economy in Yemen, the Gulf States, and the Red Sea littoral states?
- What are the most important opportunities available for youth entrepreneurship in the Blue Economy sectors in the region? And what are the specific and common challenges facing youth entrepreneurship in Blue Economy activities at the regional and general levels?
- What are the best international and regional practices in the Blue Economy? And what are the most prominent, successful, youth-led projects and initiatives in the Blue Economy locally, regionally, and internationally? And what are the lessons learned from them?
- What is the proposed comprehensive and integrated approach, potential initiatives, and innovative projects that can be applied to create a stimulating environment for innovation and entrepreneurship and enhance youth participation in the Blue Economy?
- What are the strategic and practical recommendations that can be provided to policymakers, youth leaders, and all stakeholders to enhance youth participation and entrepreneurship in the Blue Economy in Yemen, the Gulf, and the Red Sea littoral states?

3.2 Significance of the Study:

- **Theoretical Significance:** Contributing to the research literature on the Blue Economy and highlighting the role of youth entrepreneurship as a driver for transforming challenges into opportunities, leveraging youth's capacity for innovation to lead sustainable development in Yemen, the Gulf, and the Red Sea littoral states.
- **Practical Significance:** Providing policymakers, youth leaders, and other stakeholders with insights and strategic recommendations to integrate youth economically, and to stimulate investment that enhances effective and innovative youth entrepreneurship and participation in this vital sector.

04 Objectives of the Study

The paper aims to achieve six main objectives:

- Analyze previous theoretical literature on the Blue Economy, its concepts, importance, and contributions.
- Diagnose the current reality of youth participation in the Blue Economy in Yemen, the Gulf States, and the Red Sea littoral states.
- Uncover the most important available opportunities and specific and common challenges facing youth entrepreneurship and propose solutions.
- Analyze and evaluate best international and regional practices, and study selected cases of successful youth-led projects and initiatives in Blue Economy sectors, and extract lessons learned.
- Develop and propose a comprehensive and integrated approach for potential initiatives and innovative projects that can be applied locally and regionally to create a stimulating environment for innovation and entrepreneurship, and a roadmap to enhance youth participation in the Blue Economy.
- Provide strategic and practical recommendations to policymakers and youth leaders to enhance entrepreneurship and youth participation in this vital sector.

05 Methodology and Tools

5.1 Research Methodology

To achieve the study's objectives and answer its questions, the paper adopted a descriptive-analytical approach, integrating qualitative and quantitative methods. This approach was chosen because it is most suitable for studying a complex and multidimensional phenomenon such as youth entrepreneurship in the Blue Economy. It allows for examining the phenomenon in its natural context, providing a comprehensive picture of its current status, and identifying influencing factors, which supports the development of practical and targeted recommendations. This was done through:

- **Description:** To collect and categorize data and information related to Blue Economy concepts, its contributions at different levels, the current status of youth entrepreneurship, and the sector's challenges and opportunities.
- **Analysis:** To critically interpret the collected data to extract patterns and causal relationships, identify the roots of problems, and deduce lessons learned from best practices and pioneering youth-led projects, in preparation for formulating empowerment pathways and strategic recommendations.

5.2 Study Population and Sample

This research paper avoided defining a research population in the traditional statistical sense based on large representative samples, given its primary focus on qualitative analysis of the current situation and existing practices. Instead, it relied in-depth interviews that were conducted with a targeted sample of (3) leading experts in the fields of Blue Economy, development, and entrepreneurship from Yemen, UAE, and Egypt. The focus was on the quality of expertise and depth of knowledge to provide in-depth insights, rather than quantitative representation in the fields of Blue Economy, youth participation, entrepreneurship, or marine policies in the region. These experts were selected based on their extensive experience and deep knowledge of the subject. These interviews provided valuable qualitative insights that enrich the analysis and contribute to understanding the complex dimensions of the problem. In addition, six successful youth-led entrepreneurial projects and initiatives in the Blue Economy (locally, regionally, and internationally) were selected as case studies, based on the criteria of their excellence, innovation, and ability to provide clear lessons learned. These cases were analyzed in depth to extract success factors and challenges encountered.

5.3. Data Collection Instruments

• **Desk Research/Literature Review:** Through a review of theoretical literature, a comprehensive collection and review of academic literature was conducted, including articles in books and peer-reviewed scientific journals related to the concepts of Blue Economy, sustainable development, entrepreneurship, and youth empowerment. Also utilized was information related to the Blue Economy published on the official websites of international and regional organizations and research institutions . Statistical data and development indicators were also collected and analyzed, including the Blue Economy's contributions to gross domestic product (GDP) and employment opportunities. Reports consulted included those by international organizations, such as the World Bank, the United Nations Environment Program, the UN Food and Agriculture Organization (FAO), the Organization for Economic Co-operation and Development (OECD), and regional organizations, as well as government and non-governmental organizations.

• **In-depth Interviews:** A semi-structured interview guide (Appendix 1) was designed, including open-ended questions to discuss experts' opinions and their assessment of existing experiences and initiatives, identify opportunities and challenges, and gather their recommendations on ways to enhance youth entrepreneurship in the Blue Economy. Interviews were conducted via available communication means (WhatsApp and email) due to the geographical distribution of experts.

• **Case Study Analysis:** Detailed data on each selected case study was collected through reviewing available reports, news articles, and official websites of the projects or their supporting entities. The data collection focused on elements of innovation, economic, social, and environmental impact, youth participation methods, and success factors and challenges faced by these projects.

5.4. Data Analysis

• Content analysis was used for qualitative data extracted from interviews and case studies. This involved careful reading of the data and coding to extract recurring concepts, and categorizing them within the main study categories, such as challenges, opportunities, best practices, lessons learned. In addition, comparative analysis was used to compare leading practices and projects across different geographical contexts (Yemen, the Gulf, Red Sea littoral states) to identify similarities and differences and derive generalizable lessons.

- **Quantitative data (statistical and economic)** was analyzed using descriptive statistics, such as percentages and averages, to determine the size of the Blue Economy, its contribution to development, and unemployment or employment indicators. Quantitative results were integrated with qualitative analyses to provide a comprehensive and integrated understanding of the phenomenon under study.

06 Theoretical Framework

The Blue Economy constitutes a rapidly growing field of research and practical application globally. Theoretical literature has significantly contributed to formulating its concept, defining its components, and exploring its potentials and challenges at various levels, reflecting a shift in development thinking towards responsible and sustainable exploitation of marine and oceanic resources.

6.1. Sustainable Blue Economy (Concept - Definition - Dimensions).

Oceans and seas represent vital ecosystems that contribute fundamentally to sustaining life on Earth. Due to their mismanagement by humans, the prolonged global crises of the past few decades have prompted interest in providing in-depth analysis and reviews of current economic models, with the aim of seeking pathways for sustainable development. One result of this interest was the emergence of the Blue Economy concept, which has undergone semantic evolution since its appearance.

6.1.1. Concept and Evolution:

The concept of the Blue Economy has emerged in recent years as a global development approach aimed at achieving comprehensive sustainable development (World Bank & UNDESA, 2017). The credit for coining this term goes to the Belgian businessman Gunter Pauli in his 2010 book, "The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs." Pauli focused on presenting environmentally sound innovations with economic viability, characterized by low costs and rapid returns, and avoiding negative environmental repercussions, thereby distinguishing them from traditional eco-friendly technologies (Pauli, 2010). He summarized the essence of the Blue Economy in three pillars: utilizing local resources, achieving profitability, and meeting community needs.

Although the concept was officially introduced for the first time during the Rio+20 conference for the UN Sustainable Development Goals in 2012, its roots can be traced back to the Earth Summit in Rio in 1992 (Voyer, 2018, p. 604). At that summit, significant emphasis was placed on promoting the growth of the "Green Economy" as a new direction in development. Global development thinking then evolved to include increasing interest in the potential that seas and oceans could offer in achieving sustainable economic growth (Ababouch, 2015, p. 22). The term Blue Economy was not initially intended to relate specifically to oceans or inland waters, but rather was used to reflect an evolution and refinement of the "Green Economy" concept. It was also referred to as the "Green Blue Economy" or "New Green Marine Economy" in the European Union in 2011, or the "Green Economy in a Blue World" as named by the United Nations Environment Programme in 2012, or "Blue Growth" by the Food and Agriculture Organization in 2013, or "Green Growth in Fisheries and Aquaculture" by the Organisation for Economic Co-operation and Development in 2014 (Smith-Godfrey, 2016, pp. 59-63). This concept emerged, surpassing the traditional understanding of "Marine Economy" which often focuses on exploitation without considering environmental and social dimensions (Smith et al., 2010), to become an emerging model for sustainable management of freshwater and marine

natural resources (Ababouch, 2015, p. 24). Since the Rio+20 conference in 2012, global interest in the role of seas and oceans in achieving sustainable development has increased, with the Blue Economy becoming a focal point of international conferences related to global ocean sustainability.

6.1.2. Definition, Dimensions, and Core Pillars:

The Blue Economy is characterized by multiple definitions. Since its appearance at the Earth Summit in 2012, many researchers and actors in marine policy have acknowledged the absence of a clear and universally agreed-upon definition of the Blue Economy. Some have sought to impose their own definition of the term (Lee & Noh, 2020, p. 1). Others, like Deutsche Bank, consider the term to refer to all economic activities associated with the ocean (Deutsche Bank, 2024). The conceptual paper for Small Island Developing States[1] provides a general definition of the Blue Economy as an ocean economy aimed at improving human well-being and social equity while minimizing environmental risks, thus sharing goals and desired outcomes with the Green Economy (Lee & Noh, 2020, p. 5). This concept aims to promote economic growth, social inclusion, and the preservation or improvement of livelihoods, while also ensuring the environmental sustainability of oceans and coastal areas. This aligns with the need to integrate conservation and sustainability processes into marine spatial management.

The Blue Economy is defined as "a development framework aimed at promoting economic growth, social inclusion, and the preservation of sustainable livelihoods for oceans, seas, and coastal areas, while ensuring the preservation of the health of marine ecosystems" (World Bank & UNDESA, 2017). It is also defined as "a comprehensive framework and policy for sustainable marine economic activities and new marine technologies" (The Ocean Foundation, 2021). The essence of this concept lies in decoupling socio-economic development from environmental degradation, with a focus on regenerative activities that improve human health and well-being, including food security and the creation of sustainable livelihoods (Spalding, 2016). This approach aims to improve human well-being and social equity, while significantly reducing environmental risks and ecological scarcity (The Commonwealth, 2025). In an Economist report on "The Blue Economy: Growth, Opportunities and a Sustainable Ocean Economy," a working definition of the Blue Economy was identified as: "A sustainable ocean economy emerges when economic activity is balanced with the long-term capacity of ecosystems to support that activity and keep it resilient and healthy" (Godfrey, 2016).

However, the prevailing trend focuses on the "Sustainable Blue Economy," defined as ocean-related economic activity conducted within a framework designed to protect the environment, conserve natural resources, and allow for equitable development (European Commission, 2012). This distinction is crucial as it emphasizes that the Blue Economy is not limited to the economic exploitation of marine resources, but rather concerns the sustainable and regenerative use of resources, integrating environmental protection with economic growth and social justice. Others, given the inherent ambiguity of the term, have gone on to develop unifying frameworks for understanding competing discourses around the Blue Economy, identifying four dominant discourses: oceans as natural capital, as good business, as an integral part of Pacific Small Island Developing States, and oceans as a livelihood for small-scale fishing enterprises (Voyer, Quirk, et al., 2017, p. 3). International organizations provide multiple definitions that highlight different aspects of this concept, as shown in Appendix (2). The following facts are evident from the analysis of Appendix No. (2):

• The multiple definitions, through their repeated emphasis on terms such as "sustainable," "regenerative," "conservation," and "equitable development" (Spalding, 2016; Deutsche Bank, 2024; CESE, 2023), confirm that the Blue Economy represents a paradigm shift from traditional extraction

[1] States whose principal territory consists entirely of one or more islands, or parts of islands. These countries do not share land borders with any other country. Island states are spread in all continents and oceans of the world except South America (Al-Najjar, 2024).

of marine resources. It is a comprehensive approach aimed at achieving a long-term balance between economic prosperity and environmental health, directly linking human well-being to ocean health. The Blue Economy exhibits a close interconnectedness with the United Nations' Sustainable Development Goals (SDGs), particularly Goal 14, "Life Below Water" (UN, 2015). It is an integral part of the 2030 Agenda for Sustainable Development, serving as an integrated framework for achieving the 2030 Agenda. Progress in this framework contributes to achieving multiple development goals, ranging from eradicating poverty to climate action. The Blue Economy is based on three interconnected pillars that form what is known as the "Triple Bottom Line": the economic dimension, which drives economic growth and creates jobs; the social dimension, which provides livelihoods and promotes inclusion and equity; and the environmental dimension protects marine ecosystems and biodiversity. Two additional dimensions are added to these pillars: the innovation and technology dimension as a key driver for efficiency and developing new solutions (OECD, 2016); and the integrated governance dimension, as an effective coordinating framework between different sectors and stakeholders (UNEP, n.d. a).

• Environmental sustainability is an essential prerequisite for achieving economic growth in this sector. This means that any entrepreneurial initiatives or youth participation must inherently incorporate sustainability principles, as the successes of the Blue Economy are measured not only by financial profits but also by positive social and environmental impacts.

The Blue Economy can be summarized in a comprehensive definition provided by Godfrey as: "The sustainable industrialization of the oceans for the benefit of all" (Godfrey, 2016, p. 3). This definition focuses on the balance between economic, commercial, legislative, and regulatory activities, as well as the supporting systems of the ecological environment and the communities that depend on it for their livelihoods. This term also broadly includes advanced technologies and other productive economic activities in a specific region, community, or country (Ragin, 2008). It also includes transforming the methods, objectives, and ideology of economic activity to achieve development in a specific area. Oceans were included in this definition to define the operating environment and distinguish it from land, where traditional activities occur. Conversely, the "benefit" element was included to achieve a balance between improvements and well-being for both humanity and the environment, meaning the benefit accrues to both parties. The inclusion of the "all" element in the definition is an affirmation that it is a comprehensive approach that includes humans, systems, and processes. Perhaps the only universally agreed-upon characteristic of the Blue Economy is that it is a flexible concept; it is used differently in different contexts and by different actors.

6.2. International, Regional, and Local Contributions to the Theoretical Literature of the Blue Economy

6.2.1. At the international level, research focuses on multiple aspects of the Blue Economy:

• **Sustainable Economic Growth:** Studies such as the World Bank report (World Bank, 2017) indicate that the Blue Economy has the potential to generate millions of jobs annually if managed responsibly.

• **Marine Governance:** Literature highlights the importance of effective legal and legislative frameworks, and international cooperation in managing transboundary marine resources and challenges such as illegal fishing and pollution (Rosenberg et al., 2019).

• **Environmental and Climate Challenges:** Research addresses the impact of climate change on oceans (IPCC, 2021) and ways to integrate nature-based solutions into Blue Economy strategies to protect against sea-level rise and coastal degradation (Cohen et al., 2020).

• Innovation and Technology: Emphasis is placed on the role of emerging technologies such as artificial intelligence, remote sensing, marine robotics, and biotechnology in developing new sectors and increasing the efficiency of existing sectors in the Blue Economy (OECD, 2017). Theoretical literature emphasizes the importance of public-private partnerships, capacity building, and engaging local communities, especially youth, to ensure the success of Blue Economy initiatives (United Nations, 2020).

6.2.2. At the regional level, regional studies show a focus on the unique characteristics of each marine basin:

• **Red Sea and Arabian Sea:** Studies here focus on promising fish wealth, untapped potential for sustainable ecotourism (especially diving and coral reefs), and the increasing importance of maritime transport through the Bab al-Mandab and Hormuz straits (Red Sea Initiative, 2021). Research shows increasing interest in marine renewable energy, modern port development, marine tourism development, and the emergence of regional initiatives such as the Intergovernmental Authority on Development (IGAD), which promotes Blue Economy strategies for member states in the Horn of Africa, focusing on sustainable fishing, coastal development, maritime security, and combating piracy (IGAD, n.d.).

• **Arabian Gulf:** Literature highlights massive investments in marine infrastructure, global logistics ports, and the development of luxury marine tourism (such as yachts and cruises) (Al-Safran & Al-Ghafri, 2020). It also indicates increasing interest in aquaculture to address food security challenges and diversify income sources away from global oil (WAM, 2025; World Economic Forum, 2025) (MEFMA, 2022., Al-Mazrooei et al, 2021).

6.2.3. At the local level, research focuses on the following:

• **Yemen:** Previous studies and available reports indicate that Yemen possesses a long and highly valuable coastline, with largely untapped fish wealth and unique ecotourism potential (Al-Najjar, 2024) (UNDP Yemen, 2023; Al-Absi et al., 2019). Some efforts currently being made are mostly by international organizations such as the United Nations Development Program (UNDP) and FAO, focusing on supporting sustainable livelihoods for fishermen and coastal communities, and rehabilitating some damaged small ports, as initial steps towards recovery and capacity building in a challenging environment (UNDP, n.d). These initiatives remain limited in scope due to the general situation. However, ongoing conflicts, deteriorating infrastructure, and a lack of investment hinder the effective development of the Blue Economy.

• **Gulf States:** National visions such as "Saudi Vision 2030," "UAE Vision 2021," and "Oman Vision 2040" integrate the Blue Economy as an integral part of economic diversification strategies (KSA Vision 2030, 2016; UAE Vision 2021, 2010).

• **Red Sea Littoral States:** Some studies focus on the potential and development of modern ports, fish wealth, and marine tourism in countries like Egypt as a Suez Canal hub and Jordan (Abd-Elkader & Sayed, 2019).

6.3. Importance of the Blue Economy Internationally and Regionally

The Blue Economy is a massive global economic force, a fundamental driver of growth and sustainable development, and a strategic sector with immense potential for the future. Recent estimates indicate that the global ocean economy contributed between 3% and 4% of the total

global Gross Value Added (GVA) in 2020, and provided up to 133 million full-time jobs worldwide (OECD, 2021; World Bank, 2017). This sector has witnessed remarkable growth, nearly doubling in size since 1995 (World Bank, 2017), surpassing the growth rate of the global economy as a whole. These figures underscore the Blue Economy's position as a rising global economic power, suggesting that its true value remains vast and untapped. Forecasts suggest it could be almost four times larger by 2050 than it was in 1995 if exploited sustainably (OECD, 2016). This accelerated growth confirms that the Blue Economy is not just a marginal sector, but a strategic and increasingly important component of the global economic landscape.

The Blue Economy supports small and medium-sized enterprises, as it is based on an investment-driven business model that utilizes local resources. This economy focuses on creating job opportunities, building community capital, and achieving multiple cash and information flows by stimulating entrepreneurship and developing new business models, exchanging information, and disseminating knowledge. The Blue Economy revolves around the idea that companies must utilize all available resources and strive to increase efficiency, creating a portfolio of interconnected projects that benefits both themselves and society.

6.3.1. Importance of Blue Economy Sectors and Their Global Implications:

• **Fisheries and Aquaculture:** Between 10% and 12% of the world's population relies on fisheries and aquaculture for livelihoods (FAO, 2020). Approximately 58.3 million people work in primary fields related to fisheries and aquaculture, especially in small-scale fisheries. This activity can provide about 350 million direct and indirect jobs, in addition to potential economic gains from restoring fish stocks estimated at $50 billion annually (World Bank, 2017).

• **Coastal and Marine Tourism:** The majority of global tourism activities are linked to and concentrated in coastal areas. The number of tourists using marine vessels and yachts has witnessed significant growth, reaching 16 million tourists in 2011 (UNEP, 2012). Coastal and marine tourism represents a large proportion of this sector and is anan essential component of the growing and sustainable Blue Economy, supporting over 6.5 million jobs worldwide (World Travel & Tourism Council, 2023). Marine tourism ranks second after industrial fishing in terms of economic value. The global economic contribution associated with coral reef diving is estimated at nearly $1 trillion annually (The Nature Conservancy, 2017). This sector is an important source of economic development through sustainable ecotourism for many countries. The global growth rate is expected to exceed 3.5%, and coastal and marine tourism is likely to constitute the largest segment of added value in the ocean economy by 2030, at 26% (OECD, 2016).

• **Blue Biotechnology:** Marine biotechnology products contribute an estimated $208 billion to global markets, with a value of $4.6 billion in 2017 (European Commission, 2019). This sector is particularly promising in developing new medicines, cosmetics, and food products from marine resources.

• **Marine Energy:** More than 30% of the world's oil and gas production is extracted from the sea (IEA, 2021). Furthermore, oceans can provide a renewable and vast source of energy through the use of modern technology to generate energy from offshore wind, waves, and marine currents. Forecasts indicate that the power generation capacity from marine renewable energy sources could reach 175 gigawatts (GW) by 2035, compared to only 6 GW in 2012 (IEA-OES, 2020).

6.3.2. Regional Importance of the Blue Economy in Specific International Contexts:

The importance of the Blue Economy is particularly evident in some global coastal regions due to their unique characteristics:

• **Europe:** The Blue Economy has the potential to pull the continent's countries out of economic recession, with the value of Europe's marine economic output estimated at approximately $574 billion (European Commission, 2021). This sector can significantly contribute to creating job opportunities and achieving economic recovery if marine resources are exploited sustainably through environmentally friendly green investments.

• **Coral Triangle Region (Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor-Leste):** This triangle contains some of the richest biodiversity sources on Earth, equivalent to the Amazon rainforests, and includes 76% of all known coral species and over 3,000 fish species. Approximately 120 million people in the region directly depend on marine resources for income, livelihoods, and food. The value of reef-associated fisheries in Indonesia and the Philippines alone is estimated at $2.2 billion annually, and the value of coral reef-related tourism at $258 million annually (WWF, 2022).

• **Pacific Island Region:** This region includes various Small Island Developing States (SIDS), which heavily rely on their marine resources. This region provides one-third of the world's tuna production, valued at over $4 billion USD annually (SPC, 2023).

• **West Africa Region (from Mauritania to Ghana):** This region produces about 1.6 million tons of fish annually, representing the most crucial livelihood source for about 3.2 million people, and accounts for at least 10% of the total GDP in both Guinea-Bissau and Sierra Leone. Fish also provide more than 40% of animal protein for populations in Gambia, Ghana, Guinea, Senegal, and Sierra Leone (FAO, 2016). Among 54 African countries, 38 are coastal, and over 90% of African exports and imports pass through the sea. The fisheries sector alone employs approximately 12.3 million Africans (AU-IBAR, 2015).

6.3.3. Strategic Importance of the Blue Economy in Yemen, the Gulf States, and the Red Sea Littoral States:

The development of the Blue Economy is of paramount strategic importance in this region, given the long coastlines and rich marine resources these countries possess. The "Blue Economy" is a new destination for investment in water resources and one of the most important topics of sustainable development in the Gulf States (Al-Ghamdi, 2019). These countries aim to diversify their economies away from reliance on fossil fuels, and non-oil industries experienced 3.7% growth in 2024 (World Economic Forum, 2024).

• **Gulf States:** The annual economic output of the six Gulf States exceeds $6.1 trillion, forming a strong bloc of open and integrated economies (Bloomberg, 2023).

- **United Arab Emirates:** The volume of marine investment, both commercial and military, in the UAE currently exceeds 250 billion dirhams annually (equivalent to $67.5 billion). The UAE ranks 14th globally in the sum of marine indicators, classifications, and key performance levels in global maritime transport industry activities. The UAE's strategy encompasses eight main sectors, with an estimated annual added value of investment of approximately 5 billion ($1.4 billion) dirhams (WAM, 2025). In contrast, the number of SMEs reached 557,000 companies in mid-2022, contributing 63.5% of non-oil GDP. The UAE jumped to 23rd globally in the 2024 Startup Blink Global Startup Ecosystem Index (Ménon Economics, 2024).

- **Kingdom of Saudi Arabia:** The value of investment opportunities in the logistics sector is estimated at $18 billion (Vision 2030, 2016). Among the projects completed in this regard is the King Abdullah Port project in Jeddah, with an investment volume of over 40 billion Saudi riyals ($10.7 billion), expected to contribute to increasing Saudi exports to over 600 billion riyals ($160 billion) by 2030 (King Abdullah Port, 2023). It is considered the first port in the region to be fully owned,

developed, and operated by the private sector, and has been classified as the fastest-growing container port and among the top 100 ports in the world, less than four years after the start of its operational activities (Alphaliner, 2017). In contrast, the Kingdom witnessed the issuance of over 80,000 new commercial licenses in the second quarter of 2025, with female entrepreneurs accounting for 49%, and growth in commercial registrations for e-commerce. It was the most funded destination for startups in the first quarter of 2023 (ILO, 2024).

- **Sultanate of Oman:** In March 2016, the FAO selected the Sultanate of Oman, along with six other Arab countries, to be part of what is known as the Blue Economy centered on marine activities in water bodies. The fisheries sector in Oman has played an important role in achieving food security; as one of the essential productive sectors, it has a significant economic role and is at the forefront of non-oil sectors that generate income for the country (Sakhrawi & Bassah, 2021, 13). This vital sector of fisheries and aquaculture projects contributes to increasing fish production, food production, national labor employment, and the localization of modern technology applications (Muscat Daily, 2023). It recorded 141,126 small and medium-sized enterprises in the second quarter of 2024 (ILO, 2025). There is an increase in early entrepreneurial activity with significant government support.

- **Kuwait:** Maintained its eighth position in the Middle East in the 2024 Startup Blink Global Index, and witnessed record growth in non-oil sector employment, with support from the National Fund for Small and Medium Enterprise Development. It maintained its eighth position in the Middle East in the 2024 Startup Blink Global Index (ILO, 2025). It witnessed record growth in non-oil sector employment, with support from the National Fund for Small and Medium Enterprise Development.

- **Qatar:** The technical labor market is rapidly expanding, with expectations that AI will create 13,000 new jobs by 2030. Qatar jumped 11 places to rank 79th globally in the 2024 Startup Blink Global Index.

- **Bahrain:** Supports productive home-based projects through a special licensing office, organizes job fairs, and offers training programs for entrepreneurs.

• **Yemen:** The fisheries sector in Yemen is a vital lifeline, supporting the livelihoods of 18% of the coastal population (Al-Najjar, 2025). It contributes 3% to GDP and employs approximately 2% of the workforce (UNDP Yemen, 2023). Despite the severe challenges facing the sector due to conflicts and deteriorating infrastructure, its significant potential remains an incentive for future investment.

• **Egypt:** The tourism and fisheries sectors alone provide about 160,000 jobs in Egypt, emphasizing the importance of the Blue Economy in providing employment opportunities and supporting the economy (World Bank, 2024).

• **Sudan:** There are scattered efforts by international organizations to support coastal communities, but projects specifically targeting youth entrepreneurship in the Blue Economy remain limited due to current circumstances (National Blue Economy Strategy 2023-2027).

• **Djibouti:** Investments in port infrastructure development are increasing, and there is growing interest in developing ecotourism, but youth-oriented initiatives in the Blue Economy are still in their early stages (National Plan in Djibouti, 2024).

• **Somalia:** There are government efforts to build marine security capabilities to combat piracy and illegal fishing, and some international organizations (such as FAO) support projects to improve fishermen's livelihoods and build capacity in coastal communities (World Bank Group 2024).

• **Eritrea:** Eritrea has a long coastline on the Red Sea, including the Dahlak Archipelago, which is rich in marine biodiversity, though there is difficulty obtaining up-to-date and comprehensive data on the marine sector. Publicly available information on specific youth entrepreneurship projects and initiatives in the Blue Economy in Eritrea is very limited due to the nature of the country's political system (World Bank Group 2024).

From the preceding analysis, it is clear that the Blue Economy represents a growing global and regional economic force, supported by immense potential in diverse sectors. Theoretical literature and economic indicators emphasize the importance of sustainability, innovation, and inclusivity as fundamental pillars for its development. The increasing interest in the region, especially Yemen, the Gulf States, and the Red Sea littoral states, highlights the urgent need for in-depth studies that directly link youth empowerment and entrepreneurship to ensure sustainable exploitation of marine resources and achieve prosperity for current and future generations.

6.4. Environmental Dimensions and Climate Change in the Blue Economy

Climate changes, such as sea-level rise, ocean acidification, and increasingly extreme weather events, pose an existential threat to marine ecosystems and coastal communities. Overfishing and pollution (especially plastic pollution) are ongoing challenges that threaten the health of oceans and fish stocks. The ocean plays a crucial role in regulating Earth's temperature and absorbing carbon dioxide, absorbing 25-30% of CO2 emissions from human activities and 93% of excess heat in the atmosphere. Coastal ecosystems known as "blue carbon" – such as mangroves, salt marshes, and seagrass beds – are particularly effective in capturing and storing carbon (Al-Najjar, 2024).

The Blue Economy offers significant opportunities for climate change mitigation and adaptation by focusing on sustainable practices and innovation. This includes developing marine renewable energy (such as offshore wind, tidal energy, wave energy, and biofuel from algae), decarbonizing the shipping sector, and enhancing the conservation and restoration of coastal and ocean ecosystems as natural carbon sinks. The ocean is not merely affected by climate change, but it is also a fundamental solution to it through its ability to absorb carbon and provide clean energy sources. This shifts the perspective from the ocean as a victim to beings a strategic partner in combating the climate crisis, and calls for massive investments in "blue carbon" solutions, the development of marine renewable energy technologies, sustainable fishing and aquaculture, building resilience, and implementing projects such as building marine barriers and providing safe housing (World Bank, 2024). The use of spatial planning to identify protected areas and guide economic activities to reduce environmental impacts opens new avenues for scientific research and entrepreneurship in sectors not traditionally associated with the marine economy. From the above, it is clear that the Blue Economy, despite its potential, faces serious environmental threats, necessitating the integration of climate action and environmental protection measures as essential elements in all its strategies.

07 Analysis of Current State of Youth Entrepreneurship in the Blue Economy

Understanding the current state of entrepreneurship and youth engagement in the targeted regions is crucial for designing effective initiatives. This analysis highlights the leading role of youth and significantly analyzes the current situation across the targeted regions by analyzing strengths, weaknesses, opportunities, and threats, taking into account the disparities between these regions. It then concludes by analyzing the main challenges facing youth in general and identifying the main opportunities for youth participation at the primary and secondary sectors of the Blue Economy.

7.1. Youth Entrepreneurship in the Context of the Blue Economy

Entrepreneurship is defined as the process of identifying and developing a vision for a new, often nascent, venture, which begins with the creation of a new project and then its development and transformation into a successful business. Youth entrepreneurship in the context of the Blue Economy involves creating and developing innovative projects that utilize marine and coastal resources in a sustainable manner, contributing to the achievement of environmental, social, and economic goals (UNCTAD, 2020). The importance of youth entrepreneurship lies in job creation, innovation and green solutions, economic diversification, and empowering local youth to become development leaders in their coastal communities, which enhances economic and social resilience.

Youth participation in the Blue Economy depends on several theoretical determinants that can be summarized in the "Capability-Opportunity-Motivation" (COM-B) model, adapted for entrepreneurship (Michie et al., 2011). Understanding these determinants helps in formulating targeted interventions to enhance youth participation. For example, Yemen may need to focus on improving awareness, capacity building, and providing basic opportunities, while the Gulf States may need to enhance the reflective motivation for innovation in advanced sectors, and conversely, the Red Sea littoral states need to combine capacity building and innovation support.

Youth are a fundamental driving force for innovation and sustainable transformation in the Blue Economy. The role of youth is shifting from symbolic participation to strategic leadership, especially in the Gulf States and the Red Sea littoral states. While youth are increasingly invited to forums and consultations, youth demonstrate leadership capacity for organizations (Ocean Decade, 2025), develop policy recommendations (UNDP, 2025), and drive innovation (Aletihad, 2025). This means that their role is evolving from mere participation to active leadership and strategic influence. To fully exploit these potentials, a shift in perspective is required towards youth from mere beneficiaries to essential partners in achieving sustainable development, as youth recognize the challenges that must be faced to adopt practices that reflect sustainability. This active role of youth goes beyond merely being beneficiaries of job opportunities, to becoming active agents in shaping the future of the Blue Economy. Their creative energy and adaptability to new technologies position them ideally to lead change and develop innovative solutions to environmental and economic challenges.

7.2. Analysis of the General Geographical and Economic Context

The current situation varies significantly among the targeted regions, necessitating a detailed analysis, as follows:

7.2.1 Yemen: Conflict, Recovery, and Untapped Potential

• **Challenges:** These include conflict and instability, population displacement, and widespread economic deterioration, making investment in any sector, including the Blue Economy, highly risky. Weak infrastructure, including deteriorating ports, transport networks, and lack of energy and water, hinders any marine economic activity. The absence of legal and policy frameworks, along with a lack of clear legislation to support investment in the Blue Economy or marine environmental protection, increases uncertainty. Exacerbating factors include: a lack of funding and access to markets, with difficulty in obtaining capital for projects, and limited links to regional and international markets; deterioration of marine resources from overfishing, marine pollution, and destruction of coral reefs due to conflict and unsustainable activities (Al-Najjar, 2024); lack of specialized skills due to a shortage of vocational training programs and higher education in modern marine fields (United Nations, 2022), leaving youth unqualified for new job opportunities.

• **Opportunities:** These include a long and rich coastline extending over 2,500 km on the Red Sea, Arabian Sea, and Gulf of Aden; with rich marine biodiversity (OCHA, 2023). Promising fish resources, and unique island and marine tourism sites such as the Socotra Archipelago, and other areas with global ecotourism potential (Al-Najjar, 2025). The Blue Economy can be a major driver of economic recovery and job creation for unemployed youth. The availability of support from international organizations and donor institutions for Blue Economy initiatives in Yemen as part of reconstruction and development efforts presents a valuable opportunity to support emerging projects. Despite the challenges, youth, as a driving force, possess a spirit of perseverance and innovation (in-depth interview with Yemeni Blue Economy expert, dated: 2/7/2025).

7.2.2 Gulf States: Economic Diversification and Advanced Blue-Led Entrepreneurship

• **Challenges:** These include historical reliance on oil despite diversification efforts, where the economy still heavily depends on hydrocarbons, reducing the incentive for investment in new sectors. Lack of specialized national competencies endures despite the presence of world-class universities, while there may be a shortage of graduates specialized in advanced Blue Economy fields, such as ocean technology and marine energy engineering). National youth face competition in the labor market from skilled foreign labor. Despite support programs, the culture of entrepreneurship in some countries is still developing, and some youth may prefer government jobs.

• **Opportunities:** The Blue Economy has become an essential part of ambitious future plans, such as Saudi Vision 2030, UAE Vision 2071, and development strategies in Kuwait, Qatar, Bahrain, and Oman, and they are paying increasing attention to economic diversification and the Blue Economy. There exists abundant funding and the ability to invest huge capital in infrastructure projects and advanced technologies in the Blue Economy; developed infrastructure, possessing modern ports, global logistics networks, and advanced technology; significant government support and support programs for entrepreneurs, business incubators, and investment funds (Sakhrawi & Bassah, 2021, 7). There is also a demonstrated focus on innovation technology and opportunities to develop advanced solutions in areas such as smart ports, marine renewable energy, and high-tech aquaculture (in-depth interview with Emirati Blue Economy expert, dated: 28/6/2025).

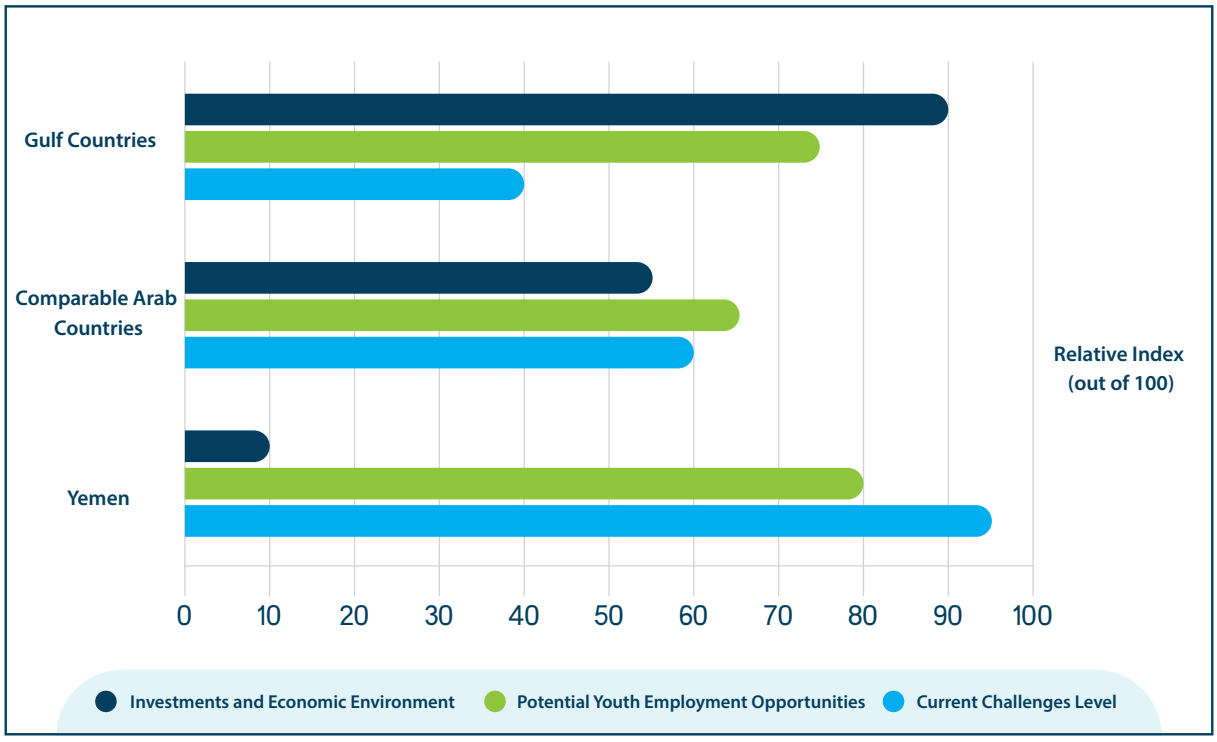
7.2.3 Red Sea Coastal States: Strategic Opportunities and Common Challenges

• **Challenges:** These include environmental pressures, such as pollution, overfishing, and degradation of marine habitats, affecting the potential of the Blue Economy. In addition to weak bureaucracy and difficulties in accessing finance, young entrepreneurs face administrative and banking obstacles. Additionally, there is weak regional coordination and a lack of cooperative frameworks for exchanging experiences and coordinating policies in the Blue Economy (Bonfil, 2003). Further challenges are irregular migration, which increases pressure on coastal communities and affects stability, in addition to insufficient capacity building programs, and a lack of specialized vocational training that connects youth with new opportunities (Hassan, 2014, 58).

• **Opportunities:** These include a rich history of marine activities that can build on traditional experiences in fishing and maritime trade; significant tourism potential from attractive beaches and rich marine cultural heritage; and international cooperation and opportunities to obtain technical and financial support from programs aimed at Blue Economy development. Increasing environmental awareness also contributes to opportunities to develop projects in ecotourism, marine waste treatment, and biodiversity conservation (in-depth interview with Egyptian Blue Economy expert, dated: 30/6/2025). The Red Sea littoral states (such as Egypt, Jordan, Sudan, Eritrea, Djibouti, Somalia) share varying challenges and opportunities (Plan Bleu, 2020; AfDB, 2020). Geographical location plays a crucial role in the development of the Blue Economy for these countries.

It is clear from Figure (1) that the degree of benefit from the Blue Economy varies significantly among the countries of the region, reflecting variations in investments, infrastructure, and stability.

Figure 1: The Relative Distribution of the Levels of Challenges, Opportunities, and Investments in the Blue Economy in the Countries of the Region



Source: Prepared by the researcher.

7.3. Major Challenges Facing Youth Entrepreneurship in the Blue Economy:

Despite the immense potential of the Blue Economy and the pivotal role of youth within it, youth entrepreneurship in this sector faces a complex and intertwined set of challenges (structural, environmental, operational, economic, and financial), extending to regulatory hurdles and skill shortages that impede its growth and impact. These are as follows:

7.3.1 Environmental Challenges: Environmental challenges pose an existential threat to the entire Blue Economy. If not addressed seriously, the resources upon which this economy relies will erode, undermining any developmental or entrepreneurial efforts in this sector:

• **Climate Change:** Climate change represents a direct threat to coastal areas and island nations through sea-level rise, ocean acidification, and rising ocean temperatures. These changes exacerbate coastal erosion, impact freshwater sources, and alter fish stock distributions, negatively affecting livelihoods and ocean-related economic activities. Poor practices such as overfishing, illegal fishing, marine pollution, rising levels of marine debris, rising ocean temperatures, and ocean acidification pose serious threats to marine ecosystems and are major challenges facing the Blue Economy (Research Gate, 2025; Al-Aqel, A. 2025.). Climate change, rising fuel costs, and recurrent energy shortages pose significant challenges affecting project sustainability (UNDP Yemen, 2025). There is an urgent need for an integrated action plan for peacebuilding and governance reforms to ensure the sustainability of reconstruction and rehabilitation plans (UNESCWA, 2025).

• **Marine Pollution:** Pollution causes the degradation of marine ecosystems and affects biodiversity. Sources of pollution include oil and chemical spills resulting from marine accidents, the discharge of fuel residues, waste (especially plastic, which amounts to approximately eight million tons annually), and unregulated wastewater discharge. These pollutants can travel through currents to affect distant areas and natural reserves.

• **Overfishing:** Excessive, illegal, unreported, and unregulated (IUU) fishing leads to the depletion of fish stocks, especially near coastlines (Al-Najjar, 2024). This depletion reduces fishing opportunities, threatens food security, and negatively impacts the livelihoods of fishermen and coastal communities dependent on these resources.

• **Infrastructure Deterioration:** The basic infrastructure for the fisheries sector, such as fish landing sites and associated markets, suffers from deterioration due to conflicts and natural events, hindering the sector's efficiency and leading to significant waste of catch. Small-scale fisheries in Yemen face difficulty accessing infrastructure, markets, and credit, limiting their ability to develop (Research Gate, 2011).

• **Conflicting Uses:** Human expansion and increasing activities in the ocean threaten to increase conflicts between different sectors (such as tourism and industrial fishing), and between economic activities and marine life, requiring integrated management to avoid harmful competition over resources.

7.3.2 Economic and Financial Challenges:

Economic and financial challenges represent a vicious cycle between risks and funding. Lack of funding is not just a financial problem but a result of perceived risks in the marine sector. These risks make financial institutions hesitant to invest, leading to a lack of funding, which in turn hinders project development and reduces their ability to overcome these risks:

• **SME Funding Gap:** Small and medium-sized enterprises (which include most startups) face a huge funding gap estimated at $250 billion in GCC countries (Channel Capital, 2025). Traditional banks tend to favor government entities and large corporations, with over 80% of bank loans in Gulf countries allocated to these entities. In contrast, SMEs receive less than 7% of total credit facilities in Saudi Arabia and only 2% in Qatar (Channel Capital, 2025). A contradiction is observed between strong government support for innovation and entrepreneurship in Gulf countries and the persistent large SME funding gap (World Economic Forum, 2025; GCC SG, 2025). This indicates that policy intent does not always translate into effective access to finance for young entrepreneurs, and that the financial ecosystem still poses significant obstacles for smaller, youth-led projects.

• **Perceived Investment Risks:** Marine projects, especially in the Gulf, are affected by banks' perception of the stability of sovereign-backed borrowers compared to "riskier" small projects. High collateral is required, and banks lack reliable data for risk assessment, hindering startups' access to finance (Channel Capital, 2025). Startups face funding challenges due to investor caution and regulatory uncertainty (Times of India, 2025). High interest rates and cash flow burdens are risks associated with private credit (Fast Company ME, 2025). This leads to hesitation among banks and financial institutions in providing the necessary funding for ship construction and repair projects, as well as marine infrastructure.

• **Reliance on Foreign Shipping:** Heavy reliance on foreign shipping services increases import and export costs and drains foreign currency, weakening countries' trade balances and hindering economic diversification efforts.

• **Infrastructure Deficiencies:** Deficiencies in local infrastructure for shipbuilding and marine manufacturing hinder job creation opportunities and economic growth in the maritime transport sector (Al-Najjar, 2025). This increases costs and reduces competitiveness, emphasizing that building local capacities in these areas is essential to reduce external dependence and increase the creation of high value-added job opportunities for youth. Addressing these challenges requires comprehensive and continuous strategies that go beyond financial investments to include structural and cultural reforms to ensure full and sustainable youth participation.

• **Access to Markets:** Lack of access to modern equipment, transportation, storage, and digital tools hinders adding value to products and market expansion (IPP Media, 2025).

7.3.3 Regulatory Challenges and Skill Shortages:

Regulatory challenges and skill shortages are closely intertwined; lack of awareness leads to weak regulatory frameworks, and skill shortages hinder the implementation of these frameworks, creating an unfavorable environment for entrepreneurship. This indicates that any strategy to support the Blue Economy must include a strong component for simultaneously building human and institutional capacities.

• **Lack of Awareness and Knowledge:** The lack of awareness and understanding of the importance of the Blue Economy, its benefits, and the challenges it faces is a significant factor hindering its full implementation. This deficiency extends to industries, the general public, and policymakers alike. Although youth in the region's countries show high awareness and participation in sustainable development goals (PwC, 2024), challenges such as a lack of professional skills (UNESCO, 2025) and limited access to finance (Channel Capital, 2025) prevent them from translating this awareness into entrepreneurial action. This indicates an "action gap" between youth awareness and their actual ability to implement solutions, emphasizing the need to provide enabling environments and practical, direct support, rather than just theoretical knowledge.

• **Skill Shortages:** The mismatch between the skills of the workforce and the evolving needs of Blue Economy sectors persists, in addition to a shortage of qualified personnel, leading to labor shortages in some sectors such as ports and maritime transport. Many educated and skilled individuals migrate from some countries in search of better salaries, conditions, and job opportunities. In Yemen, many young people lack the professional and entrepreneurial skills necessary to secure sustainable employment (UNESCO, 2025). Despite high ambition in artificial intelligence in Gulf countries, there is still a shortage of specialized talent; in Saudi Arabia, there are about 5,000 specialists, and in the UAE about 7,000 specialists, which are limited numbers compared to countries like Germany (over 40,000) (BCG, 2025). There is an urgent need to enhance cooperation between academia and industry to bridge the gap between research and application in marine biotechnology (Al-Najjar, 2025). Skill gaps are also evident in areas such as marine biotechnology. The absence of field experiences for natural science students can leave them uncertain about their career paths (ICES Journal of Marine Science, 2024).

• **Regulatory Uncertainty:** The regulatory landscape in global maritime affairs is constantly evolving, including strict environmental standards and safety regulations. This evolution necessitates continuous updates and maintenance of marine infrastructure and vessels, which increases funding complexities and creates an environment of uncertainty for investors and entrepreneurs. In the Gulf, the absence of unified standards for evaluating and classifying sustainable financial services and products can result in varying valuations (Deutsche Bank, 2025). Regulatory uncertainty poses a significant challenge for startups, particularly in emerging sectors such as blockchain (Times of India, 2025; Fast Company ME, 2025).

• **Lack of Training and Education:** In Yemen, education and training opportunities are limited, and youth are often excluded from decision-making processes in their communities (UNESCO, 2025).

• **Cultural and Social Restrictions:** Societal norms in some regions pose additional barriers and cultural restrictions that limit women's participation in training, preventing females from traveling alone without an escort (IPP Media, 2025). There are many examples in Yemen, as well as countries such as Sudan and Somalia.

From the above, it is clear that youth entrepreneurship in the Blue Economy in the region faces major challenges centered around access to finance, relevant skills and training, supportive infrastructure, and inclusive decision-making platforms. A common denominator among the targeted regions is that the essential elements for successful entrepreneurship are often missing or difficult to access. These challenges are rooted in the broader economic and social environment; the conflict in Yemen has led to fragmented public institutions and a lack of national strategies and budgets, exacerbating economic instability and skill shortages (UNSDCF, 2022). In the Gulf States and Red Sea littoral states, the banking sector's preferences for large corporations, high collateral requirements, and traditional risk assessment models hinder the growth of innovative, youth-led SMEs (Channel Capital, 2025). This means that addressing these challenges requires systemic reforms that go beyond merely providing training or small grants.

7.4 Opportunities for Youth Entrepreneurship in Blue Economy Sectors

The Blue Economy represents a promising sector for enhancing youth employment and supporting structural transformation in developing economies, as marine economic activities can generate more job opportunities for youth than for older age groups (World Bank, 2024). The Blue Economy offers diverse entrepreneurial opportunities for youth, ranging from traditional sectors enhanced by technology (such as fisheries and tourism) to emerging fields (such as marine biotechnology and renewable energy). The shift towards sustainability and technological innovation within the Blue Economy creates new high-value opportunities for youth, especially in areas such as climate-smart

fisheries, ecotourism, and green energy solutions (UNDP, 2025). This demonstrates that youth-led innovations are not only about job creation but also about driving local development, enhancing community resilience, and contributing to national climate goals, thereby creating a multiplier effect that extends beyond economic gains.

Tables (2) and (3) illustrate the diverse entrepreneurial opportunities for youth in this sector, dividing them into priority primary sectors and promising secondary sectors, with an indication of potential, entrepreneurial and job opportunities, and areas of innovation, as follows:

7.4.1 Priority Primary Sectors:

These sectors offer significant employment and entrepreneurial opportunities for youth due to increasing market demand and growth potential.

Table (2) Diverse Entrepreneurial Opportunities for Youth in Priority Primary Sectors of the Blue Economy in the Region.

Field	Potential	Opportunities for Youth
		Entrepreneurship
Sustainable Aquaculture	Aquaculture is a solution for food security and reducing pressure on natural fisheries (FAO, 2020). Targeted regions have suitable coastlines and warm waters. Developments in marine aquaculture have seen positive growth of 90% in value in the Mediterranean region over the past decade, and global aquaculture production is projected to reach 106 million tons by 2023 (Med Blue Economy Platform, 2025). This industry contributes to creating new jobs and developing coastal communities.	Establishing small and medium-sized fish/shrimp/oyster farms using Recirculating Aquaculture Systems (RAS) technologies (floating cages, closed freshwater/saltwater aquaculture systems with RAS technologies).
Marine and Coastal Ecotourism	Sustainable marine and coastal tourism is a promising sector in the Blue Economy, contributing about 10% of global GDP and providing one in every 10 jobs worldwide (UNWTO, 2019). This tourism focuses on preserving the natural environment and local culture, while providing unique experiences for travelers, and highlights its significant economic contribution and focus on unique and environmentally friendly experiences. This means that sustainable tourism is not limited to attracting visitors, but focuses on providing direct economic benefits to local communities (such as creating jobs and increasing income) while preserving their natural and cultural heritage (CESE, 2023). The region boasts stunning beaches, rich coral reefs, and attractive marine biodiversity, supporting environmentally responsible tourism.	Establishing companies to offer diving tours, eco-friendly boat trips, accommodation in eco-lodges, organizing marine environmental conservation events, and creating digital tourism platforms that promote marine biodiversity.
Sustainable Fisheries and Fisheries Management	Fisheries are a traditional and vital sector for many coastal communities (FAO, 2020). Focusing on sustainability contributes to the continuity of the resource. It enhances transparency in marine supply chains. This shift towards sustainable practices enhances the value of marine products and opens new markets for eco-friendly products. The United Nations Development Programme (UNDP) and its partners have launched transformative initiatives to rehabilitate fisheries infrastructure, support vocational training, and empower women-led businesses (UNDP Yemen, 2025; Research Gate, 2011). The use of advanced and eco-friendly technologies, such as Internet of Things (IoT) sensors, AI-powered monitoring, and blockchain technology, enhances the efficiency and transparency of supply chains. This shift indicates the adoption of smarter and more environmentally responsible fishing practices and reduces environmental impact.	Establishing projects for processing and marketing sustainable fish (environmentally certified), developing value-added fish products.
Ports and Maritime Logistics	Maritime transport is a vital lifeline for global trade, transporting over 80% of global goods (UNCTAD, 2019). It is also a major driver of growth in the ocean economy. In contrast, it also contributes 2.8% of annual greenhouse gas emissions (IMO, 2021). This indicates an urgent need to maintain the efficiency of global trade while urgently working to decarbonize this sector. This challenge creates wide entrepreneurial opportunities for youth, especially with increasing environmental awareness and global legislation aimed at reducing emissions, thus green logistics and sustainable maritime transport become promising entrepreneurial opportunities for youth.	Small companies in marine logistics services (storage, handling), small vessel maintenance, providing catering services to vessels.

7.4.2 Promising Secondary Sectors;

These sectors offer opportunities for innovation and entrepreneurship for youth with advanced skills, directly contributing to achieving sustainable development goals within the Blue Economy.

Table (3) Diverse Entrepreneurial Opportunities for Youth in Promising Secondary Sectors of the Blue Economy in the Region.

Field	Potential	Opportunities for Youth
		Entrepreneurship
Offshore Renewable Energy	Offshore renewable energy is a fundamental pillar of the sustainable Blue Economy and a clean energy source (IRENA, 2018). It offers immense opportunities for young entrepreneurs in developing clean energy solutions. Youth are a key driving force for digital and green transformation in the Blue Economy. This energy includes diverse sources such as wave energy, tidal energy, marine currents, temperature gradients, salinity, in addition to offshore wind energy and floating solar energy. GCC countries plan to invest $100 billion in renewable energy by 2030 (Arab News, 2025).	Companies and centers in research and development, design, installation, and maintenance.
Marine Biotechnology	Marine biotechnology is defined as the application of science and technology to aquatic organisms to produce knowledge, goods, and services. It includes microorganisms (such as microalgae, bacteria, and fungi), algae, and invertebrates (such as starfish, sea cucumbers, and sea urchins). Marine biotechnology converts aquatic biomass into food products, feed, nutrients, pharmaceuticals, cosmetics, energy sources, packaging materials, clothing, and much more. Algae cultivation for food and pharmaceutical production is a promising opportunity (CESE, 2023; EIT Food, 2022). Its importance lies in extracting active compounds from marine organisms for applications in medicine, cosmetics, food, and energy (OECD, 2017).	Startups to develop sustainable products from marine resources.
Marine Technology	Artificial Intelligence (AI) and the Internet of Things (IoT) are key drivers of innovation in the marine sector, and youth are leading this transformation. Marine startups integrate AI to improve navigation, optimize fleet performance, and reduce emissions (Marine Link, 2025). The Arab IoT & AI Challenge is a regional program for capacity building and pre-incubation for students and startups with innovative ideas in these fields (Arab IoT & AI Challenge, 2025). IoT-powered vessel tracking systems can also contribute to a sustainable marine environment by tracking fishing areas and preventing collisions (MDPI, 2021).	Startups using these technologies to enhance cargo handling efficiency, reduce congestion, and improve real-time shipment tracking, thereby reducing costs and enhancing supply chain transparency.
Marine Environmental Monitoring and Protection	The urgent need to protect oceans from pollution and climate change constitutes a growing service sector (UNEP, 2022).	Entrepreneurs in marine waste management companies.
Shipbuilding and Repair	There is continuous demand for building and maintaining ships and boats, with increasing interest in "green" eco-friendly vessels (IMO, 2021).	Entrepreneurs in shipbuilding and maintenance companies and vessel service management.
Non-Living Resources: Water Desalination	These resources include hydrocarbons, minerals, and water (such as desalination and salt extraction). Water desalination is an important sector, especially in arid regions, and contributes to providing fresh water for civil, agricultural, and industrial uses. Although it is an energy-intensive industry, integrating it with offshore renewable energy sources offers economic opportunities.	Entrepreneurs in companies designing innovative desalination technologies, especially those powered by renewable energy sources.

08 Best Practices and Case Studies in Youth Entrepreneurship in the Blue Economy

Learning from successful and unsuccessful experiences is essential for designing effective initiatives. These practices and experiences document the importance of comprehensive and targeted approaches that not only focus on technical skills but also address funding challenges, the regulatory environment, and changing societal perceptions to support youth. To foster youth entrepreneurship in the Blue Economy, it is essentialto build an integrated support ecosystem that goes beyond fragmented interventions. This system is based on multiple pillars, including: effective policies, sustainable finance, building skill and knowledge capacities, and enhancing effective communication. This requires close cooperation between governments, international organizations, and NGOs to provide an enabling environment that ensures youth full access to necessary resources, from basic training to scaling up their projects. Inclusivity and adaptation to local contexts are also crucial factors, necessitating the adoption of gender-sensitive approaches and mechanisms that focus on empowering local communities and integrating indigenous knowledge into the core of building these practices. Best practices for youth entrepreneurship within the Blue Economy emphasize the need to adopt integrated and sustainable solutions that are compatible with local contexts and support marginalized groups, to ensure the fairness and effectiveness of initiatives. This section reviews the most prominent of these practices at the international and regional levels as follows:

8.1 Best International Practices

International practices embody a strategic direction towards building youth capacities and supporting their innovations within the Blue Economy framework, while taking into account cultural and social diversity. Leading countries worldwide offer inspiring models in developing integrated systems for innovation and youth entrepreneurship in the Blue Economy, as follows:

8.1.1 Demand-Driven Training Programs and Green Skills.

- **Australia:** Australia's Vocational Education and Training (VET) sector is where educational and vocational training institutions in the country focus on providing students with practical skills and training for specific jobs or industries. This includes a close partnership with the marine industry to design training programs that directly respond to labor market needs, such as green skills related to marine sustainability. It offers programs such as apprenticeships and vocational certificates in industrial and economic fields (NCVER, 2021).

- **Norway:** The "Ocean Industries Forum" brings together industry players, universities, and government to encourage innovation and entrepreneurship in the marine sector, with a special focus on supporting youth-led startups.

- **Pacific Region:** Regional Maritime Training Centres offer specialized programs in navigation, marine engineering, and fisheries management, with a focus on safety, security, and sustainability, enhancing youth employment opportunities in the marine sector (SPC, 2018).

• **Blue Futures Pathways:** An Emirati initiative by the Students on Ice (SOI) Foundation that connects youth (aged 15-35), as well as professionals in the first 10 years of their ocean-related careers, with education, training, leadership, employment, and funding opportunities in the sustainable Blue Economy (interview with Emirati expert, 28/6/2025). The initiative particularly focuses on underrepresented youth in remote and rural areas.

• **Blue Economy Youth Initiative, European Union:** This initiative focuses on empowering youth by providing training opportunities, access to finance, and establishing networks to support their projects in the Blue Economy. It has resulted in numerous startups in areas such as ocean monitoring, marine energy, and aquaculture (European Commission, 2021).

8.1.2 Specialized Blue Business Incubators and Accelerators

• **Portugal:** Startup Portilao is a business incubator that focuses exclusively on innovations in the Blue Economy. Examples of its work include providing guidance and mentorship through a network of mentors and experts in various fields, helping startups overcome challenges and capitalize on opportunities. It also provides shared and equipped workspaces for startups, allowing them to focus on developing their businesses. It assists startups in accessing funding sources such as investors and venture capital funds, and building networks of relationships with other companies, investors, and experts, such as renewable energy, information technology, and artificial intelligence companies. It has helped about 15 startups, 70% of which expanded into the market. A prominent example is an aquaculture project that uses oyster shells to produce cement and tiles (Startup Portilao, n.d).

• **Netherlands:** The Ocean Cleanup is a non-profit organization based in the Netherlands, embodying youth leadership in developing innovative technological solutions to combat plastic pollution in the oceans, led by Boyan Slat. Among the inspiring examples it has undertaken is the design of an innovative system known as System 001, which is a 600-meter-long floating tube that collects plastic from the sea surface, . The system is tracked using GPS technology to ensure its effective operation. It was tested in the Pacific Ocean in 2019, where it was deployed in the "Great Pacific Garbage Patch," a large area of plastic pollution in the ocean. The system successfully collected large quantities of plastic, including plastic bags, bottles, and small pieces (interview with Egyptian expert, dated 30/6/2025).

• **Singapore:** The city-state is a global center for maritime transport and technological innovation, which has invested in smart ports that rely on artificial intelligence, creating opportunities for youth in smart logistics and marine robotics (interview with Yemeni expert, dated 2/7/2025).

• **Canada:** "Blue Tech" supports marine technological innovation and encourages youth-led startups to develop solutions for ocean challenges and vessel efficiency (Al-Najjar, 2025).

• **European Union:** (Blue Invest) An initiative that provides technical support and funding for startups and SMEs in the Blue Economy, with a special focus on innovation and sustainability (European Commission, Blue Invest, n.d).

• **Youth Innovation Challenge:** Calls on young innovators (aged 15-30) from around the world to submit creative solutions to address pressing marine environmental issues, such as marine biodiversity and reducing marine debris (Global South Opportunities, 2025).

• **Indonesia:** Offers acceleration programs for innovative blue startups (BISA), with successful examples such as "Aruna," a company that digitally connects small-scale fishermen to global markets (interview with Emirati expert, dated 28/6/2025).

8.1.3 Access to Innovative Finance

• **Norway (Bluefront Capital):** A venture capital fund focused on aquaculture technology startups, providing funding and strategic support for promising youth-led projects (Bluefront Capital, n.d).

• **United States of America:** The world's leading economy offers strong support programs and a conducive investment environment for marine energy and biotechnology. This includes establishing the global "Youth Ocean Network" to connect and empower youth (interview with Egyptian expert, 30/6/2025).

• **Green/Blue Bonds:** This financial instrument has been adopted by the World Bank and global lenders such as the European Bank, and applied in many countries, including Egypt, the UAE, and European nations. Green and blue bonds are used to finance environmentally sustainable projects, including those in the Blue Economy. Youth and entrepreneurs can access this type of funding through large projects (World Bank, 2018).

• **Youth Employment and Entrepreneurship Program (YEEB) in Egypt:** Focuses on supporting green entrepreneurship (Ecopreneurship), providing training, mentorship, and access to green finance for youth in sectors such as agriculture and fisheries (UFM Secretariat, 2025).

• **International Organizations:** United Nations organizations (such as FAO, UNEP, UNDP, ILO, UNESCO), and the World Bank play a pivotal role in supporting and developing the Blue Economy and empowering youth in the region, providing funding, technical expertise, capacity building, and political advocacy and promoting the Blue Economy agenda at the global and regional levels. The World Bank provides support for Blue Economy projects, and the African Development Bank (AfDB) supports job creation for youth in the Blue Economy. The European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) also participate in initiatives such as the Mediterranean Blue Partnership.

8.1.4 Awareness and Community Capacity Building

• **Ocean Citizenship Programs:** These are initiatives implemented in many countries around the world and vary according to local context and environmental needs. They aim to enhance awareness of the importance of oceans and individuals' responsibility towards them, and encourage youth to engage in marine environmental conservation activities and related entrepreneurship. For example, in the United States, it is implemented through the Environmental Protection Agency, in Canada through its government, and in Australia, the government offers the Australian Ocean Citizenship initiative, which has resulted in local initiatives such as "Be an Ocean Friend" and "Clean the Beach" (Ocean Literacy, 2020).

• **World Food Forum Youth Assembly:** Affiliated with the Food and Agriculture Organization (FAO) and based in Rome, Italy, it invites youth in fisheries and aquaculture to help lead the future of the Blue Economy, working to raise awareness and enhance youth participation in decision-making processes related to the sector (World Food Forum, 2025).

• **Heirs To Our Ocean (H2OO):** An international youth-led organization that empowers them to become leaders in their communities, advocate for policy change, and share their stories to protect the ocean. The organization collaborates with various international organizations such as the United Nations Environment Program, the International Maritime Organization, and FAO (Ocean Decade, 2025).

• **Non-Governmental Organizations (NGOs):** Many NGOs are actively involved in Blue Economy projects, often focusing on community-led initiatives, environmental awareness, and direct support for youth and marginalized groups. Examples include: Emirates Nature-WWF, Ocean Foundation, Save the Philippine Seas, Planeterra, and Sustainable Ocean Alliance (SOA).

• **Gulf Bloggers:** These active youth initiatives on social media represent a model of youth-led environmental awareness. These groups aim to raise awareness of marine environmental issues in the Arabian Gulf, organize beach cleanup campaigns, document marine life, and encourage sustainable practices, reflecting the growing role of youth in protecting their environment (interview with Emirati expert, 28/6/2925).

• **Coastal Guardians Initiative:** This Emirati youth initiative directly focuses on restoring degraded coastal marine ecosystems. Young volunteers participate in planting mangroves, restoring damaged coral reefs, and monitoring marine environmental health, demonstrating their ability to implement impactful environmental projects (interview with Emirati expert, 28/6/2925).

8.2 Regional Practices

This section presents the most prominent regional practices to support and empower youth entrepreneurship in the Blue Economy, with a focus on comprehensive initiatives and targeted programs that have proven effective:

8.2.1 United Arab Emirates

A pioneer in supporting marine technology startups, benefiting from programs such as "Future Leaders" and providing financial support and training through "Dubai SME" and Khalifa Fund (Dubai Future Foundation, n.d). It also focuses on specialized marine education through the "Dubai Maritime Navigation Institute" (DMNA), which is a prominent example of investment in specialized marine education. The institute offers specialized training programs for youth in vital areas such as navigation, marine engineering, and smart port management, with a special focus on job localization and empowering national competencies in the growing marine sector (World Bank, 2024). The institute aims to equip youth with the necessary skills and knowledge not only to work in this sector but to lead it in the future. It supports initiatives to develop sustainable and intelligent marine technologies, with startups focusing on developing environmental solutions for marine engines, new types of fuel, and technologies to reduce marine waste. It also focuses on smart yacht systems and marine technologies that use artificial intelligence and the Internet to improve safety and efficiency. These areas are fertile ground for young entrepreneurs (Abu Dhabi Tourism & Culture Authority, 2020). Additionally, the Goumbook organization in the UAE focuses on empowering youth to become environmental leaders, especially in combating marine plastic pollution through Citizen Science. These initiatives do not directly create startups, but they build youth capacities that can later launch entrepreneurial projects in marine pollution solutions (interview with Emirati expert, dated 28/6/2025).

8.2.2. Oman

Provides support for entrepreneurs through national programs such as "Riyada" and "Al Awael," and enhances environmental awareness through campaigns and workshops. The Omani government encourages sustainable youth-led aquaculture projects, with the aim to increase local fish production and create job opportunities through youth aquaculture projects (Oman Vision 2040,

2020). These projects rely on the latest technologies to increase production and reduce environmental impact. The Sultanate provides the necessary technical and financial support to establish these projects, with a focus on youth in coastal areas (Med Blue Economy Platform, 2016).

8.2.3 Egypt

Focuses on the Blue Economy as a new strategic direction, and offers specialized incubation programs such as (the Egyptian Entrepreneurship and Innovation Center). This supports youth environmental initiatives in conducting eco-diving tours, in addition to supporting the establishment of marine waste management companies, providing innovative solutions for waste collection, and cleaning beaches and marine areas. It focuses on marine life awareness and coral reef conservation, and provides incubators and accelerators for startups in the marine sector. It implements government and community initiatives to train and qualify young fishermen in coastal cities on best practices for sustainable fishing, and the use of modern technologies that reduce waste, increase efficiency, and preserve fish stocks (Egyptian Ministry of Agriculture, 2023). These programs also encourage youth to diversify their income sources by engaging in marine ecotourism or developing marine handicrafts, thereby increasing the value of their products. And supporting digital applications and platforms promote sustainable tourism, and eco-friendly marine activities, which indicates the existence of large tourism companies that can be a model for specialized startups (interview with Egyptian expert, dated 30/6/2025).

8.2.4 Saudi Arabia

Through Vision 2030 and the National Red Sea Sustainability Strategy, the Kingdom of Saudi Arabia offers NEOM projects (Oxagon, The Line, Red Sea Project) and Public Investment Fund programs to create job opportunities, stimulate innovation, research and development, and support companies in marine sectors such as ecotourism, fishing, renewable energy, and biodiversity (KSA Vision 2030, 2016). The Ministry of Environment, Water and Agriculture offers five pioneering initiatives to support aquaculture, marketing campaigns to attract investors and infrastructure development, and provides specialized research centers in marine sciences and aquaculture, such as King Abdullah University of Science and Technology. There is also a focus on entrepreneurship in regenerative tourism that goes beyond sustainability to regenerate ecosystems. This trend creates opportunities for youth startups focused on immersive and educational tourism experiences that contribute to protecting and regenerating the marine environment. As well, drone coastal monitoring technologies, a government initiative through the National Center for Environmental Compliance, use drones to monitor coasts and protect marine resources, opening new horizons for youth startups specialized in developing and operating these technologies (interview with Emirati expert, dated 28/6/2025).

8.2.5 Kuwait

Kuwait, through Vision 2040, encourages investment in marine technology, aquaculture, renewable energy, and infrastructure development, creating new job opportunities and enhancing food security.

8.2.6 Jordan

Jordan seeks to establish Aqaba as a regional center for the Blue Economy, while providing support for young entrepreneurs in sectors such as coastal tourism, waste management, renewable energy, and desalination projects, and other youth initiatives in marine ecotourism. Jordan focuses on innovation in water resource management, opening doors for the Blue Economy in unconventional ways. For instance, in the field of water innovation and aquaculture, initiatives like the "Water Innovation Expansion" project focus on youth ideas and leadership to solve the water crisis (Abd-Elkader & Sayed, 2019). This involves supporting youth entrepreneurial projects in developing startups specialized in low-water consumption aquaculture technologies, such as integrated aquaponics with hydroponics, as well as water treatment and reuse solutions, and marine applications.

8.2.7 Djibouti

The "Djibouti COVID-Affected Livelihoods and Jobs Response" project, funded by USAID, aims to enhance youth skills and pilot new youth-led value chains. The "Transformative Governance for Inclusive and Resilient Socio-Economic Recovery" project, run through the UNDP, aims to empower youth through training, access to finance, technology, and decision-making roles. The "Djibouti Youth Employment Activity" successfully identified over 600 potential jobs in the construction and tourism sectors, and achieved a 77% employment rate among youth who completed workforce development programs (National Plan, 2024).

8.2.8 Sudan

The Intergovernmental Authority on Development (IGAD) helps organizes regional training for youth on the Blue Economy and healthy aquatic ecosystems. Other projects include "Promoting Employment in Darfur for Refugees, IDPs and Host Communities / Youth, Employment, Skills", in addition to marine environmental conservation projects such as the management of the Dungonab National Marine Park (National Blue Economy Strategy 2023-2027).

8.3. Selected Case Studies of Innovative and Successful Youth Projects and Initiatives in the Blue Economy.

This section presents case studies of innovative and successful entrepreneurial projects and initiatives in the Blue Economy led by youth, highlighting technological innovation as a pivotal enabling factor. These examples underscore the importance of integrating advanced technologies such as renewable energy, artificial intelligence, and robotics, to overcome challenges and achieve sustainable solutions. They also confirm that investment in Science, Technology, Engineering, and Mathematics (STEM) education, digital literacy, and providing advanced technological infrastructure are vital elements for developing a sustainable Blue Economy led by youth at both regional and international levels.

8.3.1 Al-Faqm Women's Tuna Canning Association in Aden, Yemen

Location:
Aden, Yemen

• Innovation and impact:

With support from the Enhancing Social Cohesion and Building Community Resilience in Yemen (SIERY) project of the European Union and the UNDP, a small tuna canning factory was established. This project represents a model for enhancing the added value of marine products through local processing and extending the shelf life of tuna products, which enhances food security and provides a stable product in the local market (UNDP Yemen, 2025).

• Youth Participation:

Women and girls were economically empowered by training them in tuna preservation and processing techniques. Young women like Fatima and Saboot Abdo are inspiring success stories, having transformed raw tuna into a reliable source of income, and now training others to do the same, contributing to increased demand for locally processed tuna and expanding distribution (UNDP Yemen, 2024).

• Lessons learned:

- **Focus on Community Development:** The importance of involving local communities, especially marginalized groups such as women, in designing and implementing projects to ensure their sustainability and effectiveness.

- **Bottom-Up Capacity Building:** The necessity of providing targeted training and funding for SMEs led by youth and women to economically empower them and generate sustainable income opportunities.

- **Partnerships with International Organizations:** Leveraged technical and financial support provided by international organizations to scale up local initiatives and achieve greater impact.

8.3.2 Aquaventure Initiative in Oman

Location: Oman

• **Innovation and Impact:**

This is an entrepreneurial initiative in the marine tourism sector led by Omani youth Muhab Mohammed Al-Shibli. The initiative focuses on sustainable ecotourism, offering diving and exploration tours of Omani islands, with an emphasis on raising environmental awareness among tourists. The initiative started with one boat and expanded to include two boats, with support from national entrepreneurship programs in the Sultanate (Muscat Daily, 2025). The project contributed to creating local job opportunities for Omani youth and enhanced awareness of the importance of preserving the marine environment.

• **Youth Participation:**

The young man "Muhab" represents an inspiring model for youth entrepreneurship in the Blue Economy. His team mostly consists of young Omanis trained in ecotourism principles and customer service, highlighting the pivotal role of youth in developing new and sustainable sectors.

• **Lessons Learned:**

- **Ambitious Strategic Vision:** The importance of a clear national vision that directs investments towards the Blue Economy and supports youth initiatives within it.

- Investment in Smart Infrastructure: **The availability of** advanced infrastructure (such as port facilities and logistics services) contributed to supporting the growth of tourism entrepreneurial projects.

- **Providing Support and Training:** Providing an attractive environment through financial support and continuous training for emerging entrepreneurship programs in promising sectors.

8.3.3 "Strider" AI Platform in the UAE

Location: United Arab Emirates

• **Innovation and impact:**

High school students developed an advanced AI-powered platform specifically designed to protect marine biodiversity. The platform predicts future trends in marine environmental changes and proposes innovative solutions to challenges, using data collected from satellites and drones. This project represents a significant advancement in marine environmental monitoring and management, providing accurate analyses and vital indicators (Aletihad, 2025).

• **Youth Engagement:**

This project, led by young Emirati women, illustrates how AI can effectively contribute to data-driven environmental solutions, and emphasizes the ability of youth to harness advanced technology to solve complex environmental problems.

• Lessons learned:

- **Importance of Government Support and Funding:** Providing initial capital and logistical support is crucial for the growth of technology-based startups, especially in sensitive environmental areas.

- **Advanced Infrastructure:** The existence of an advanced technological environment (such as 5G networks and data centers) is essential to support innovation in emerging sectors that rely on modern technologies.

- **Attracting Global Talent:** The ability to attract minds and competencies from all over the world enhances competitiveness and innovation, and accelerates the pace of technological development.

- **Focus on the Future:** Investing in future and unconventional sectors that offer innovative and sustainable solutions is key to long-term economic diversification.

8.3.4 Enara Project in Bahrain

Location: Bahrain

• Innovation and impact:

A youth-led project aimed at developing an innovative lamp powered by seawater, integrating technology with local heritage and culture. The lamp uses ionization and electrolysis processes to generate electricity, and also functions as a charging port and Bluetooth speaker (The Dawoodi Bohras Middle East, 2025). The project aims to promote awareness of sustainable practices and provide alternative and eco-friendly energy solutions, inspired by the uses of salt and water in Bahraini culture.

• Youth Participation:

An architecture student led the design and development team for this project, highlighting the ability of youth to integrate advanced technology with cultural design to create sustainable and practical solutions that meet community needs.

• Lessons learned:

- **Technological Infrastructure:** The existence of an advanced technological environment is vital to support innovation in emerging sectors and projects of a complex technical nature.

- **Forward Thinking:** Focused on investing in future, unconventional sectors that offer innovative and sustainable solutions to current challenges.

- **Integration of Technology and Heritage:** The possibility of integrating modern technological solutions with cultural and heritage elements to create unique products.

8.3.5 Ocean Cleaning Robots in the UAE

Location: United Arab Emirates

• Innovation and impact:

Emirati youth designed and built innovative solar-powered robots to clean oceans from plastic pollution. These tangible efforts to combat marine pollution demonstrate the ability of youth to inspire a new generation of environmental innovators and change perceptions about what youth can achieve in marine environmental conservation (UAE Stories, 2025).

• Youth Participation:

These projects are led by youth aged (13-17), combining advanced technical skills (such as programming, mechanical design, and 3D printing) with a strong environmental commitment. This reflects the level of awareness and the ability to practically apply technological solutions.

• Lessons learned:

- **Advanced Infrastructure:** The existence of an advanced technological environment in the country supports innovation in emerging sectors and high-tech projects that require research and development resources.

- **Focus on Future Technology:** This includes early investment in future, unconventional sectors that offer innovative and sustainable solutions to global challenges.

- **Early STEM Education:** Emphasises the importance of encouraging STEM education at an early age to develop youth's innovative capabilities.

8.3.6 "Blue Lab" Center in Piraeus, Greece

Location: Piraeus, Greece

• Innovation and impact:

"Blue Lab" is an innovation center aimed at introducing entrepreneurs and youth to the concept of the Blue Economy through the use of advanced industrial technologies, such as 3D printers and automation systems. The center fostered entrepreneurial growth, it raised awareness of the Blue Economy through targeted entrepreneurship and education programs, becoming a reference point for innovation in the Blue Economy in the Attica region (Blue Lab, 2025).

• Youth Engagement:

Youth lead this center, offering "blue" acceleration programs for young entrepreneurs to help them develop innovative business strategies and products, in addition to workshops for building essential practical skills.

• Lessons learned:

- **Targeted Education and Training:** Establishing supportive training programs and targeted education initiatives (formal and informal) to enhance blue knowledge and skills is crucial.

- **Integrated Innovation System:** Providing funding, mentorship, and support networks for startups helps ensure their success and sustainability.

- **Focus on Human Resources:** Investing in educating and training youth in the advanced skills is necessary to develop the Blue Economy, transforming them into leaders and innovators in this field.

8.4 General Lessons Learned from Practices and Case Studies.

The wide diversity of support models, ranging from global programs to regional initiatives and specialized local projects, underscores the need for a multi-level approach to empowering youth in the Blue Economy. This diversity emphasizes that there is no one-size-fits-all solution, necessitating the construction of an integrated support ecosystem that combines international frameworks, regional cooperation platforms, and comprehensive national and local programs for all stages of youth entrepreneurship development. Therefore, policymakers should design an integrated ecosystem, leveraging various stakeholders such as UN agencies, NGOs, government bodies, the private sector, and youth leaders, to ensure comprehensive coverage of the entrepreneurial journey. In light of this, a set of best practices focusing on building a supportive and inclusive system can be adopted, namely:

- **Integrated Approach:** Blue Economy and economic development strategies must be integrated with environmental protection and social justice. This comprehensive approach contributes to achieving true sustainability and ensures equitable distribution of benefits.

- **Targeted Capacity Building:** Providing training programs, mentorship, and skill development is vital to equip youth with the knowledge and capabilities necessary to work in Blue Economy sectors. These programs should focus on technical, digital, and entrepreneurial skills.

- **Facilitating Access to Finance:** The necessity of establishing diverse financing mechanisms specifically designed for youth-led startups, including grants, soft loans, venture capital, and crowdfunding platforms. Risks associated with investing in these projects must also be reduced through public-private partnerships.

- **Incubation and Acceleration Programs:** Business incubators and accelerators provide workspaces, legal support, market access, and networking opportunities with investors, enhancing the chances of startup success.

- **Favorable Policy Frameworks:** Policy frameworks must be dynamic, inclusive, and encouraging of innovation, and reduce regulatory barriers that may hinder the growth of startups.

- **Enhancing Cooperation and Partnerships:** It is important to encourage cooperation between governments, the private sector, NGOs, academic institutions, and local communities. This cooperation enables the exchange of knowledge and resources and enhances the effectiveness of initiatives.

- **Data and Knowledge Exchange:** Improving access to reliable information and data on marine resources and economic opportunities is essential to support informed decision-making for entrepreneurs.

- **Focus on Local Needs and Context:** Entrepreneurial solutions must be designed to suit local contexts and address the specific needs of coastal communities. This approach ensures that initiatives are community-rooted and sustainable in the long term.

- **Gender Inclusivity:** Efforts must ensureeffective participation and empowerment of women at all levels of the Blue Economy, and providing training, support, and equal opportunities.

09 Results of Qualitative Data Analysis from Interviews

Experts' responses show varying and similar insights into the Blue Economy and youth entrepreneurship in their different regional contexts. The main points of agreement and disagreement can be summarized as follows:

9.1 Points of Agreement and Similarity:

1. Comprehensive Definition of the Blue Economy: All experts agree that the Blue Economy goes beyond traditional exploitation of marine resources to include sustainable development, a balance between economic growth and environmental preservation, and diversification of income sources. All consider it a vital engine for sustainable development and a lever for food security and job creation.

2. Importance of Economic Diversification: Experts believe that the Blue Economy represents an important opportunity to diversify national income sources, whether away from oil, such as in the UAE, or to enhance food security and job opportunities in countries like Yemen and Egypt.

3. Increasing Youth Interest: All experts note a growing interest among youth in entrepreneurship in marine-related sectors, with existing initiatives to support them, although they vary in size and scope.

4. Promising Opportunities: Experts interviewed for this paper agreed that sectors such as sustainable fisheries, aquaculture, ecotourism, marine technology, marine biotechnology, and marine infrastructure hold great opportunities for development and investment.

- Common Challenges: The experts agree that there are major challenges hindering the development of the Blue Economy and youth entrepreneurship, most notably:

- Environmental Challenges: Such as marine pollution, overfishing, and the impacts of climate change.
- Economic and Financial Challenges: Difficulty in accessing sufficient and affordable finance, especially for SMEs and startups.
- Regulatory Challenges: The existence of unclear or complex legal and policy frameworks.
- Skill Shortages: There is a need for specialized vocational training programs to bridge the gap in competencies required for modern Blue Economy sectors.

5. Importance of Partnerships and Capacity Building: Experts emphasize the importance of effective partnerships between the public, private, academic, and civil society sectors, and the necessity of building capacities and developing specialized skills to support this sector.

6. Focus on National Strategies: All experts' recommendations include the necessity of developing clear and comprehensive national strategies for the Blue Economy that integrate youth and support entrepreneurship.

9.2 Points of Disagreement and Variation:

Level of Awareness:

- **Yemen:** Awareness of the Blue Economy is very limited, and the focus is on crisis and conflict response.

- **Gulf:** Awareness is very high among leaders and policymakers, and there is strong institutional commitment.

- **Red Sea Littoral States:** In Egypt, awareness is growing governmentally and academically, and the challenge is to translate it into large-scale practical projects. Awareness in Sudan, Eritrea, and Somalia is generally limited. Except for Djibouti, there is a developing growth at the level of policymakers and youth.

Reality of Youth Entrepreneurship:

- **Yemen:** Youth participation is weak and limited due to infrastructure destruction and security risks. Transformational youth leadership is almost absent.

- **Gulf States:** Youth participation is strongly supported by national visions, incubators, and accelerators, and a remarkable shift towards strategic youth leadership is observed.

- **Red Sea Littoral Countries:** Youth participation is growing, there are incubation initiatives in Egypt, and transformational youth leadership has begun to emerge, but it needs greater enhancement in the rest of the countries.

Type of Opportunities and Challenges:

- **Yemen:** Opportunities and challenges are related to basic needs and reconstruction (traditional fisheries, basic ecotourism, destroyed ports). Challenges are existential (conflict, lack of oversight, huge funding gap).

- **UAE:** Opportunities and challenges focus on advanced technology and innovation (smart ports, marine renewable energy, biotechnology). The biggest challenge is the SME funding gap and the lack of specialized national competencies in advanced fields.

- **Egypt:** Opportunities and challenges are medium-scale, combining traditional and advanced practices in sectors such as ecotourism, aquaculture, water desalination, and Suez Canal logistics. Challenges include bureaucracy and a lack of targeted funding mechanisms.

- **Sudan, Djibouti, Somalia, and Eritrea:** Opportunities and challenges focus on exploiting the geographical positioning, as the Blue Economy represents a golden opportunity for these countries to achieve sustainable development and create promising job opportunities for youth. The major challenges are instability and underdeveloped infrastructure.

Best Practices Model:

- **Yemen:** Lessons learned focus on community support, partnerships with international organizations, and bottom-up capacity building.

- **UAE:** Lessons learned focus on government investment in advanced technologies, multilateral partnerships, and innovative financing mechanisms.

- **Egypt:** Lessons learned focus on cooperation between governments, universities, and the private sector, simplifying procedures, and digitalization.

- **Sudan, Djibouti, and Somalia:** Lessons learned focus on ensuring that entrepreneurial solutions address local contexts and the specific needs of coastal communities.

9.3 General Recommendations:

• **Yemen:** Focus on restoring stability as a prerequisite, while also exploring internationally supported small financing funds and vocational training programs.

• **UAE:** Focus on transparent regulatory frameworks, expanding specialized business incubators, sovereign investment funds, advanced blue finance tools, and educational programs in STEM and ocean technology.

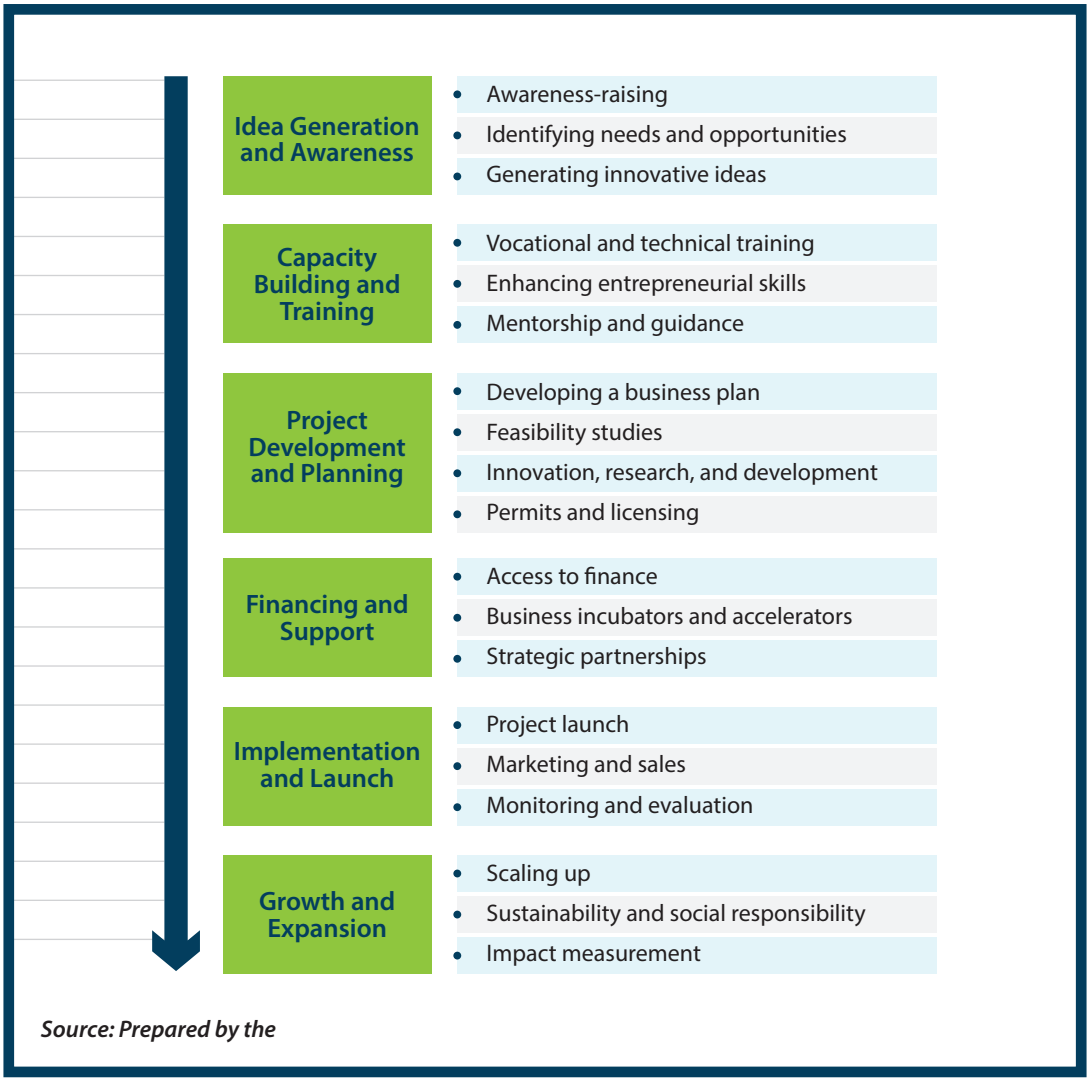
• **Egypt:** Focus on simplifying regulatory frameworks, business incubators in coastal cities, financing funds in cooperation with development banks, encouraging crowdfunding, and integrating the Blue Economy into curricula.

• **Sudan, Djibouti, Somalia, and Eritrea:** Focus on leveraging geographical positioning through investment in capacity building, exploring new funding sources, developing policy frameworks, and enhancing cooperation.

10 Proposed Pathways to Enhance Youth Engagement in the Blue Economy: From Idea to Project

Figure No. (2) illustrates the six pathways to enhance blue youth entrepreneurship from idea generation to capacity building, project development, access to finance, implementation and launch, and finally growth and expansion. Empowering youth in the Blue Economy in the region requires the implementation of two parallel pathways: establishing initiatives and innovative entrepreneurial projects, while enhancing regional cooperation. This all requires a roadmap to create a stimulating environment for innovation and entrepreneurship, and support youth in their professional and entrepreneurial journey.

Figure (2) Youth Blue Entrepreneurship Pathway "From Idea to Implementation."



Source: Prepared by the

10.1 Pathway One: Potential Initiatives

Enhancing a youth-led Blue Economy at the regional level requires a collaborative approach that brings together countries, institutions, and stakeholders. This shift from purely national efforts to regional cooperative initiatives can accelerate the development of the Blue Economy, enhance competitiveness, and address common challenges more efficiently, particularly in areas that require significant capital or specialized knowledge.

10.1.1 Ideas for Joint Regional Initiatives:

The following regional initiatives can contribute to maximizing impact:

- Regional Program for Knowledge and Experience Exchange in the Blue Economy:

Establish a regional program that facilitates the exchange of youth and experts between countries. Yemeni youth, once conditions stabilize, can receive intensive training in advanced institutions in Gulf countries, while experts from the Gulf can provide training workshops and capacity building in Yemen. This contributes to the transfer of knowledge, technology, and best practices (World Bank, n.d. b).

- Regional Network for Young Entrepreneurs in the Blue Economy:

Launch a strong digital platform and physical network for communication and ideas exchange among young entrepreneurs from various Red Sea littoral countries. This network can organize specialized regional conferences and workshops, as well as facilitate partnerships between emerging projects and the exchange of investment opportunities.

- Regional Blue Economy Investment Fund:

Establish a joint investment fund involving regional countries, with the aim of supporting youth-led startups in the Blue Economy. This fund should specifically focus on innovative projects that serve sustainable development goals and create a positive economic, social, and environmental impact.

- Joint Regional Awareness Campaigns for Marine Environmental Protection:

Organize wide-ranging regional awareness campaigns, in cooperation with regional and international organizations (such as the UNEP), targeting marine environmental protection and raising awareness of the importance of the Blue Economy as a promising future career and economic path, with broad youth participation (Clean Seas, n.d).

- Joint Initiatives for Marine Environmental Conservation:

Launch joint regional campaigns to combat marine pollution and overfishing, actively involving youth in planning and implementation (UAE Stories, 2025). Expand regional Blue Carbon networks to protect and restore vital coastal ecosystems such as mangroves and seagrasses.

- Initiatives to Encourage Innovation and Technology Adoption:

Develop applications for water quality monitoring, vessel tracking, and fisheries management using artificial intelligence and big data for marine data analysis. Support startups that offer technology-based solutions to address environmental and economic challenges in the marine sector.

- Developing In-depth Comparative Research and Studies:

Encourage young researchers from Yemen, the Gulf States, and the Red Sea littoral states to conduct studies on best practices, challenges, and opportunities in the Blue Economy at the regional level, and publish them in scientific journals. In addition to scientific journals, publish joint articles in specialized media platforms to exchange knowledge, highlight success stories, and showcase pioneering projects in the region. Conduct detailed feasibility studies for potential and promising projects in the region, in cooperation with international experts and institutions, to ensure the economic feasibility and environmental and social sustainability of these projects.

10.1.2 Ideas for Potential Marine Initiatives to Enhance Youth Opportunities and Funding

To maximize the entrepreneurial potential of youth in the Blue Economy, these proposed initiatives offer integrated solutions to enhance employment opportunities and facilitate access to necessary funding.

- Establish Community Blue Innovation Hubs

• **Idea:** Create centers in coastal cities and areas that provide co-working spaces, logistical support, and mentorship for young entrepreneurs. These centers can include small workshops and mini-labs for prototyping innovative marine products and services, and basic equipment such as 3D printers and simple welding equipment.

• **Target:** Yemen (for recovery and reconstruction), rural areas in Red Sea littoral states, and less developed areas in the Gulf.

• **Partnerships:** Local municipalities, private sector, civil society organizations, and international donors.

- Establish Blue Seed Fund

• **Idea:** A dedicated fund that provides small, soft, and accessible loans or grants for promising youth projects in the Blue Economy. The fund can include an "Angel Investment" system to support projects in their early stages. Projects are evaluated based on their economic viability and their environmental and social impact.

• **Target:** All regions where access to finance is difficult.

• **Partnerships:** Development banks, microfinance institutions, investment companies, international donors.

- Create a Blue Market Linkage Program

• **Idea:** An initiative to connect the products and services of young entrepreneurs in the Blue Economy with local, regional, and international markets. This can include organizing trade fairs, assisting in brand building, and developing e-commerce platforms for marine products.

• **Target:** Gulf States (for export), other countries (for access to international markets), and Yemen (to stimulate local trade).

• **Partnerships:** Chambers of commerce and industry, shipping companies, e-commerce companies, and trade promotion organizations.

10.1.3 Ideas for Initiatives to Enhance Youth Capabilities and Awareness

Enhancing youth capabilities and raising their awareness are crucial elements in driving innovation and entrepreneurship within the Blue Economy. In this context, the following proposed initiatives are presented:

- Organize Blue Innovation Challenges and Ocean Hackathons:

Organize annual or semi-annual competitions for youth to present innovative solutions to pressing challenges related to the marine environment and the Blue Economy. These challenges can include issues such as pollution control, improving fishing methods, and developing sustainable tourism. These competitions offer financial prizes and support for developing winning ideas.

- Start Blue Youth Ambassadors Programs

• **Idea:** Select a group of inspiring young people to be ambassadors for the Blue Economy in their communities. They are trained on the concept of the Blue Economy, its opportunities, and the importance of sustainability. They then spread awareness in their local and regional communities through media campaigns, volunteer activities, organizing workshops, awareness events, and field visits to schools and universities.

• **Target:** Yemen (for basic awareness), Gulf States and Red Sea littoral states (to enhance community participation).

• **Partnerships:** Ministries of youth and sports, ministries of education, environmental organizations, universities.

- Establish a Blue Digital Academy

• **Idea:** An online educational platform that offers free or low-cost training courses in specialized Blue Economy fields, such as the principles of sustainable aquaculture, basics of marine navigation, digital marketing for marine products, and designing eco-tours. It can include advanced courses in ocean technology and marine data.

• **Target:** All regions, with a focus on Yemen and Red Sea littoral states for ease of access.

• **Partnerships:** Universities, vocational training institutes, technology companies, international e-learning platforms.

- Enhancing Tripartite Partnerships:

Build strong and effective partnerships between the private sector, the public sector, universities and academic institutions, and civil society organizations. These partnerships should aim to provide practical training and employment opportunities for youth in companies operating in the Blue Economy, in addition to conducting joint research that contributes to the development needs of the sector.

10.2 Pathway Two: Proposing Innovative Youth-Led Projects in the Blue Economy:

Empowering youth to develop innovative entrepreneurial projects and technical solutions within the Blue Economy is vital for achieving sustainable development. Below matrix is a set of proposals for emerging projects that youth can implement and lead, categorized by major sectors:

10.2.1 Innovative Aquaculture Projects

These projects focus on adopting modern and sustainable aquaculture technologies to enhance food security and reduce environmental impact.

Table 4: Proposed Entrepreneurial Projects to Enhance Youth Participation in the Regional Blue Economy

Proposed Project	Idea/Goal	Innovation	Impact
Vertical or Circular Fish Farms with Precision Aquaculture Technologies	Designing and implementing advanced aquaculture systems (e.g., vertical or circular farming) that use small spaces and rely on water recycling, significantly reducing water consumption.	Providing high protein production in areas with limited water resources or high population density, while optimizing water use.	Enhancing food security, reducing pressure on water sources, and providing sustainable protein production solutions.
Cultivation of Non-Traditional Marine Species or Climate-Resistant Species	Focusing on cultivating marine species with high economic value or those that have shown high adaptability to environmental changes and rising water temperatures.	Diversifying fish production sources and reducing risks associated with climate change on traditional fish stocks.	Enhancing environmental resilience, opening new markets for marine products, and achieving sustainability for the aquaculture sector.
Microalgae Production Project for Extracting	Investing in microalgae farms to produce multi-purpose raw materials.	Using algae to produce sustainable animal feed, bio-fertilizers, or as a source of clean biofuel, providing	Contributing to the circular bioeconomy, reducing reliance on traditional resources, and providing value-added products.
and Manufacturing High-Value Bio-compounds from Marine Waste Project for Establishing "Environmentally	Using marine biotechnology techniques (e.g., fermentation and enzymatic hydrolysis) to extract high-value compounds from aquaculture farm waste or fish processing plants (e.g., collagen, chitin, Omega-3).	eco-friendly solutions. Transforming environmental waste into valuable products used in pharmaceutical, cosmetic, and nutritional supplement industries, creating	Reducing environmental pollution, promoting the circular economy, and creating job opportunities in the marine biotechnology sector.
Sustainable Oyster and Mussel Farms" as a Natural Defense Line	Utilizing the ecological role of oysters and mussels in water purification and forming natural structures (reefs) that weaken wave energy and stabilize sediments in shallow coastal areas, while achieving sustainable economic returns.	added economic value and reducing waste. Integrating commercial aquaculture with coastal protection functions and improving water quality, providing a natural, environmental, and economically effective solution.	Protecting coasts from erosion, improving water quality, supporting biodiversity, and providing sustainable marine products.

10.2.2 Eco-Friendly Marine Technology Initiatives

These projects aim to develop and apply innovative technological solutions to enhance sustainability and efficiency in marine activities.

Proposed Project	Idea/Goal	Innovation	Impact
Project for Developing Small Fishing Boats Powered by Solar or Hybrid Energy	Designing and manufacturing small fishing boats that rely on solar energy or hybrid propulsion systems to meet the needs of local fishermen.	Reducing carbon emissions, lowering fossil fuel consumption and operating costs for fishermen.	Protecting the marine environment, supporting sustainable livelihoods for fishermen, and promoting the use of clean energy.
Project for Developing and Providing a Specialized Service for Fisheries Monitoring Using Drones and Artificial Intelligence	Employing drones equipped with sensors and artificial intelligence to collect and analyze data on fish stocks, monitor illegal fishing, and assess the health of marine habitats.	Providing a technology-based service to government bodies and cooperative associations to enhance sustainable fisheries management, instead of traditional methods.	Improving the protection of fish stocks from depletion, reducing illegal fishing, and increasing the efficiency of fisheries management.
Project for Developing a Digital Platform (Application and Website) Directly Connecting Sustainable Fishermen with Consumers	Creating a transparent online marketplace that directly connects fishermen committed to sustainable fishing practices with consumers (individuals, restaurants, hotels), with a product tracking system.	Shortening the supply chain, empowering sustainable fishermen, and providing a conscious seafood choice for consumers.	Encouraging responsible fishing practices, increasing fishermen's income, and stimulating the local economy of coastal communities.

10.2.3 Sustainable and Community-Based Marine Tourism Projects

These projects focus on providing unique tourism experiences that respect the environment and support local communities.

Proposed Project	Idea/Goal	Innovation	Impact
Project for a Floating Hotel or Eco-Resort Powered by Renewable Energy	Establishing floating accommodation units that are entirely self-sufficient in energy and water needs (powered by solar and wind energy and desalination), with advanced waste treatment systems.	Reducing environmental impact on coastal lands and coral reefs, promoting the use of clean energy, and providing a unique tourism experience.	Creating local job opportunities, attracting high-value tourism, and protecting coastal and marine ecosystems.
Project for Diving and Marine Adventure Tourism Programs Focused on Sustainability and Participation	Organizing diving, snorkeling, and marine adventure trips (such as kayaking) with an emphasis on the educational aspect and environmental participation, such as workshops on marine life and waste collection sessions.	Transforming tourism activity into an interactive, educational, and environmentally responsible experience, increasing tourists' awareness of the importance of the marine environment.	Cleaning the marine environment, supporting efforts to preserve coral reefs, providing job opportunities for local guides, and enhancing environmental awareness.
Eco-Tourism Villages on Coasts Fully Managed by Local Youth	Developing and managing tourism villages that offer authentic cultural and marine experiences, with a focus on sustainability, respect for the local environment, and support for coastal communities.	A community-based tourism model that ensures economic benefits remain within local communities and promotes heritage preservation.	Economic empowerment for youth and local communities, preservation of cultural and natural heritage, and development of sustainable tourism.
Workshops for Teaching Marine Handicrafts	Organizing workshops to teach youth and the local community handicrafts using recycled materials from the beach (such as driftwood or sea glass) or sustainable materials.	Transforming waste into products with artistic and economic value, and enhancing local creativity and skills.	Creating new income opportunities, reducing marine waste, and preserving traditional arts and crafts.
Project for a Sustainable Marine Tourism Transport Network Using Electric or Hybrid Boats	Providing tourist transport services between coastal sites and nearby islands using fully electric or hybrid-powered boats, with the development of clean charging infrastructure.	Reducing carbon emissions and noise pollution, while improving air quality in marine tourism areas.	Reducing environmental pollution, providing a quiet and enjoyable transport experience for tourists, and creating new job opportunities in the maintenance and operation of electric boats.
Project for Developing "Your Marine Guide" Application	Developing a smartphone application that provides guidance services for tourists in coastal areas (diving spots, seafood restaurants, water activities), with environmental information and a direct booking system for local trips.	Integrating technology to enhance environmental awareness and facilitate access to sustainable tourism services provided by young locals.	Increasing environmental awareness, supporting youth entrepreneurship in the tourism sector, and improving the tourist experience.

10.2.4 Sustainable Projects in Marine Waste Management and the Circular Economy

These initiatives are a cornerstone in addressing the problem of marine pollution, relying on circular economy principles to transform waste into valuable resources, thereby enhancing environmental and economic sustainability.

Proposed Project	Idea/Goal	Innovation	Impact
Establishing a Specialized Project for Collecting Lost or Abandoned Fishing Gear (Ghost Nets) and Recycling Them	Organizing campaigns and patrols to collect lost fishing gear at sea, sorting and processing it, and then recycling high-quality plastic materials from it to produce new products.	Addressing a serious environmental problem (ghost fishing) through a circular economy business model that transforms pollution into valuable raw material.	Reducing plastic pollution in the marine environment, protecting marine life, and creating job opportunities in the recycling sector.
Building Small Units for Processing Collected Marine Plastic and Designing Small Autonomous Marine Robots for Waste Collection	Establishing local units for processing plastic waste collected from the sea and beaches and converting it into raw materials or useful products, in conjunction with designing and manufacturing autonomous marine robots for waste collection.	Integrated solutions for collecting and processing plastic waste using advanced robotics technologies.	Cleaning the marine environment, reducing waste, and providing recycled raw materials.
Small Project for Processing Fish and Seafood Waste in Local Fishing Ports	Collecting fish and seafood waste from fishing ports and markets and converting it into valuable products such as high-protein fishmeal (as feed or fertilizer), liquid fertilizer, or collagen extraction.	Reducing environmental pollution resulting from waste and providing additional income sources for fishermen and operators by fully utilizing resources.	Reducing pollution, promoting the circular economy, and increasing income for coastal communities.
Project for a Wastewater Treatment Unit for Aquaculture Farms Using Marine Biotechnology	Designing and building specialized units that use marine microorganisms (bacteria or algae) in bioreactors to treat and purify wastewater from aquaculture farms and extract excess nutrients.	Reduces environmental pollution, and nutrients can be recovered and converted into biomass used as organic fertilizers, closing the nutrient loop and reducing water consumption.	Protecting the marine environment, improving water quality, and providing additional resources.

10.2.5 Sustainable Projects in Maritime Transport and Logistics

These projects aim to improve the efficiency and sustainability of the maritime transport sector and its associated logistics operations

Proposed Project	Idea/Goal	Innovation	Impact
Smart Platform (AI-Powered) for Optimizing Vessel Routes and Reducing Emissions	Developing a software platform that uses AI and big data to calculate and recommend the most efficient routes for vessels in terms of fuel consumption, avoiding sensitive environmental areas, and optimizing trip speed.	Significantly reducing fuel consumption and carbon emissions, lowering operating costs for shipping companies, and increasing logistical efficiency.	Protecting the marine environment, reducing the carbon footprint of maritime transport, and increasing profitability for companies.
Launching a Smart and Sustainable Shipping Container Leasing and Management System Project	Providing shipping containers designed with more sustainable materials (lighter weight and recyclable), and equipped with Internet of Things (IoT) technologies to monitor their status and track their location.	Reducing waste in the supply chain, improving the efficient use of containers, and reducing empty return trips, as well as enhancing cargo safety.	Reducing the environmental footprint of container production and transport, and improving the operational efficiency of supply chains.
Establishing and Equipping (Fixed or Mobile) Stations for Supplying Vessels and Marine Transport Systems with Sustainable Fuel	Providing the necessary infrastructure to enable vessels to switch to low or zero-emission fuels such as green hydrogen or green ammonia.	Supporting the maritime transport sector's transition towards carbon neutrality, reducing reliance on fossil fuels, and stimulating sustainable fuel production.	Contributing to combating climate change, reducing air and marine pollution, and creating a new sector in the Blue Economy.

10.2.6 Sustainable Projects in Offshore Renewable Energy

These initiatives aim to harness marine resources to generate clean and renewable energy.

Proposed Project	Idea/Goal	Innovation	Impact
Project for Developing and Deploying Modular Wave Energy Converters to Generate Electricity for Coastal Communities and Isolated Islands	Developing small and distributed solutions for generating electricity from wave energy, suitable for remote areas and islands as an alternative to diesel generators.	Providing clean and continuous energy, improving the quality of life in remote areas, and reducing carbon emissions.	Achieving energy independence, reducing environmental and economic costs, and creating local job opportunities.
Establishing Hybrid Floating Energy Platforms Combining Solar Wind and Small Waves, Designed to Power Offshore Aquaculture Farms and Marine Monitoring Platforms	Integrating multiple renewable energy sources (solar wind and waves) into floating platforms to provide reliable power for aquaculture projects, scientific research, and offshore environmental monitoring.	Increasing the reliability of offshore power supply, reducing the carbon footprint of vital sectors, and expanding the possibility of establishing farms or monitoring stations away from the coast.	Supporting sustainability in the aquaculture and marine research sectors, and reducing reliance on fossil fuels.
Project for Developing and Deploying Small-Scale Tidal Stream Turbines to Generate Energy for Port Facilities or Small Coastal Desalination Plants	Utilizing predictable and continuous tidal energy to provide direct power for relatively stable and large loads, such as port lighting, operating electric cranes, or supplying desalination plants.	Providing a continuous and clean source of energy for vital coastal facilities, reducing reliance on the public electricity grid.	Enhancing energy security, reducing operating costs, and contributing to achieving renewable energy goals.
Developing Smart Grid & Energy Storage Systems Dedicated to Managing and Integrating Energy Generated from Offshore Renewable Sources into Coastal or Island Grids	Developing smart storage systems and forecasting and management software to maximize the utilization of generated offshore renewable energy and ensure the stability of the coastal or local grid.	Solving the challenge of renewable energy variability and availability to enable expansion in offshore renewable energy projects.	Increasing the reliability and efficiency of offshore renewable energy use, reducing the need for traditional energy sources, and building more resilient and sustainable electricity grids.
Establishing Offshore Data Centers Fully Powered by Offshore Renewable Energy	Building floating data centers that operate entirely on locally generated offshore renewable energy and utilize the cold marine environment for cooling.	Meeting the growing need for data centers while achieving sustainability and reducing pressure on terrestrial electricity grids and land areas.	Providing a sustainable and efficient solution for data centers, creating job opportunities in advanced marine technology, and pioneering sustainable computing solutions.

10.2.7 Building, Education, and Awareness Projects

These initiatives aim to equip youth with the necessary skills for, and enhance environmental awareness and community participation in, the Blue Economy.

Proposed Project	Idea/Goal	Innovation	Impact
Establishing a Practical Training Center and Business Incubator in Sustainable Marine Technology	Providing a center that equips youth, graduates, and entrepreneurs with the necessary skills and knowledge to utilize and develop modern technologies for monitoring and protecting the marine environment, as well as sustainably developing its resources (e.g., using drones and marine robots).	Integrating practical training with an incubation period for emerging entrepreneurial projects, creating new job opportunities and supporting innovation.	Developing young competencies, improving marine environmental monitoring and resource management, and encouraging entrepreneurship.
Developing an Integrated Community Training Program for Sustainable Marine Practices and Small Entrepreneurship	Targeting traditional coastal communities (fishermen, artisans) to enhance and update their skills with eco-friendly practices and technologies, while integrating an entrepreneurship component to help them develop their businesses.	A model that ensures the sustainability of local community livelihoods while preserving the marine environment and natural resources.	Enhancing sustainable livelihoods, reducing pressure on marine resources, and economic empowerment for coastal communities.
Launching an Interactive Digital Platform for Marine Environmental Education and Citizen Science	Creating a platform (application and website) to increase awareness and knowledge of the marine environment and its importance, while integrating a "Citizen Science" component that allows users to record observations and contribute to building a scientific database.	Transforming education into active participation in environmental protection and collecting valuable data for research and management.	Increasing environmental awareness, encouraging community participation, and changing behaviors towards sustainability.

10.2.8 Sustainable Projects in Policy Development and Governance

These initiatives aim to support policymakers in formulating and implementing effective and sustainable Blue Economy policies.

Proposed Project	Idea/Goal	Innovation	Impact
Project for Establishing and Developing an Interactive Data Platform to Support Policy Decision-Making	Building a digital platform that collects and analyzes data related to various aspects of the Blue Economy from multiple sources, to provide a strong and up-to-date evidence base for policymakers.	Providing an advanced data analysis service and interactive visualizations not readily available currently, as a subscription-based entrepreneurial business model.	Developing data-driven policies, modeling policy impacts before implementation, and enhancing good governance.
Project for Designing and Implementing a Methodology to Facilitate Participatory Blue Economy Policy Formulation	Developing and implementing a structured process for gathering input and engaging various stakeholders (fishermen, businesses, civil society, researchers) in the process of developing policies related to marine and coastal resources.	Providing a specialized consulting service and methodology in "policy facilitation" using innovative tools and techniques.	Ensuring comprehensive policies that consider the interests of all parties and enjoy broader acceptance, facilitating their implementation and reducing conflicts.
Project for Establishing a Specialized Program for Capacity Building and Policy Modeling for Policymakers	Developing an intensive and specialized training program (interactive workshops, policy simulations and modeling, field visits) specifically aimed at policymakers and government officials concerned with Blue Economy sectors.	Raising the level of awareness, knowledge, and analytical capabilities of policymakers, to enable them to formulate more effective, sustainable, and adaptable policies.	Enhancing institutional capacities in Blue Economy management and achieving better environmental and economic governance.

10.3 Mechanism for Implementing Innovative Projects in the Blue Economy

This table provides a concise list of proposed projects and initiatives, focusing on success factors and their potential for local and regional implementation, thereby enhancing blue youth entrepreneurship in the region.

Table 5: Project Success Factors and Implementation Mechanisms, Locally and Regionally

Project Name	Sustainable Fishing and Aquaculture Projects		
	Success Factor	**How to Implement the Project Locally**	**How to Implement the Project Regionally**
	- Modern Technologies: Recirculating Aquaculture Systems (RAS), deep-sea cages, Integrated Multi-Trophic Aquaculture (IMTA) - Training and Empowerment: Specialized training programs for youth on best practices and management - Market Access: Building effective marketing channels for local and international products, focusing on added value - Environmental Compliance: Adherence to strict environmental standards.	- Identify suitable sites (ponds, floating cages); train youth on modern aquaculture techniques; provide small loans; link farms to local markets (restaurants, hotels, fish markets, etc.). - Establish small equipped workshops; train youth on preservation, canning, and packaging techniques; assist in obtaining quality certifications; market locally processed products in stores and markets - Organize training workshops for young fishermen; provide incentives for using sustainable fishing tools; establish fishermen's cooperatives for sharing experiences and equipment. - Train youth on converting fish waste into organic fertilizers, animal feed, or even cosmetics (e.g., collagen); build partnerships with farmers or feed factories.	- Exchange of experiences and technologies at regional workshops and conferences. - Establish regional research and development centers to study local species and develop technologies. - Develop integrated supply chains to facilitate the movement of inputs (e.g., feed and seeds) and outputs (products) across borders. - Build unified regulatory frameworks to ensure quality and environmental safety

Project Name	Marine Ecotourism and Recreation Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
Environmental Preservation: Protecting coral reefs, marine organisms, and coastal areas . - Sustainable Infrastructure Development: Eco-resorts, eco-friendly diving centers . - Youth Capacity Building: Eco-tourism guides, diving instructors. - Targeted Marketing: Promoting unique natural sites.	- Train youth as guides for diving, snorkeling, and marine life viewing; develop eco-tourism routes; market services through hotels, tourism companies, and social media platforms. - Purchase kayaks, stand-up paddleboards (SUPs), snorkeling equipment, and rent them to tourists and residents; organize group tours; provide short training courses. - Design and build small, eco-friendly accommodation units (using local and sustainable materials); train youth in hospitality management; promote the location as a destination for relaxation and connecting with nature. - Train youth in underwater photography and provide necessary equipment; display works online; collaborate with diving centers and hotels to offer this service to tourists.	- Pursue joint promotion as part of inified regional marketing campaigns. - Develop cross-border tourism routes and packages connecting sites in different countries. - Exchange best practices in protected area management and eco-tourism development. - Unify regional sustainability standards for resource conservation.

Project Name	Logistics and Marine Services Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
- Workshop Development: Modernizing workshops and equipping them with modern equipment. - Youth Training: Qualifying them in maintenance and repair skills (engines, marine electronics, etc.) . - Spare Parts Provision: Ensuring the availability of original and suitable spare parts. - Safety Compliance: Applying marine safety standards.	- Train youth in repairing and maintaining boats and their engines; establish small workshops in ports or coastal villages; provide mobile maintenance services. - Train youth in supply chain management; provide food, water, fuel, and other supplies to vessels and boats docked in ports or near coasts. - Use small boats to transport goods between islands and coastal areas, or transport passengers on short trips; develop schedules and booking services.	- Establish regional vocational training centers to qualify young cadres. - Conduct experience exchange programs between technicians and marine engineers. - Build a regional supplier network for marine spare parts and equipment. - Unify maintenance and technical standards to ensure quality and safety.

Project Name	Maritime Transport Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
- Clean Technologies: Use of low-emission fuels, electric/hybrid vessels. - Energy Efficiency Improvement. - Port Infrastructure: Eco-friendly ports, electric charging stations, smart waste management.. - Vocational Training: Qualifying youth in port logistics, supply chain management, and green technology maintenance. - Compliance with International Regulations: Adherence to International Maritime Organization (IMO) standards.	- Use small boats to transport goods between islands and coastal areas, or transport passengers on short trips, develop schedules and booking services. - Provide technical skills in marine transport and port services. - Ensure availability of equipped workshops.	- Coordinate policy regionally to promote sustainable maritime transport and green ports. - Pursue joint investment in regional port development and logistics infrastructure. - Exchange experiences and technological know-how in port management and green vessel operation. - Develop regional shipping networks to enhance intra-regional trade.

Project Name	Coastal and Marine Waste Management and Recycling Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
- Community Awareness: Launch intensive awareness campaigns about marine pollution risks and the importance of recycling. - Provide waste collection points in coastal areas and ports, and systems for collecting floating waste. - Recycling Technologies: Investment in small plants for recycling plastic and other materials. - Youth Participation: Involving them in cleanup campaigns, pollution monitoring, and solution development. - Simple monitoring tools (phone apps, cameras), training on data collection, partnership with research or government entities. - Creative ideas, technical support, possibility of applying solutions on a small scale.	- Organize regular cleanup campaigns led by youth and volunteers; train youth on sorting marine waste; establish collection points for recyclable waste (plastic, glass); explore opportunities to convert plastic waste into new products (e.g., beach furniture or building materials). - Identify degraded areas; train youth on mangrove cultivation techniques and coral reef rehabilitation; organize volunteer workshops; involve schools and universities in awareness and planting programs. - Train youth on using applications to document pollution, types of marine organisms, and monitor coral reef health; establish community marine monitoring teams and provide data to relevant authorities. - Encourage youth to innovate local solutions (e.g., plastic waste traps in small ports, or developing alternatives to single-use plastic products); organize environmental innovation competitions.	- Organize regional awareness campaigns targeting coastal communities, fishermen, and tourists. - Establish regional partnerships between countries to exchange waste treatment and recycling technologies. - Training programs for youth on waste sorting, recycling, and converting it into new products. - Coordinate regional efforts to address transboundary pollution.

Project Name	Marine Technology and Innovation Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
- Innovation and Research: Discovering and exploiting active compounds from marine organisms (medicines, cosmetics, functional foods). - Access to Finance: Supporting startups and SMEs. - Marketing and Export: Developing strong brands and marketing in local and international markets - Presence of youth competencies in programming and design, understanding of marine sector needs (fishermen, ports); technical support. - Availability of drones, operation and data analysis skills, partnership with security or environmental entities. - Skills in electronics and programming, availability of simple components, partnership with universities or technical institutes.	- Encourage youth to develop smartphone applications (e.g., fish price tracking, marine weather forecasts, fishing boat booking, platforms for selling marine products); organize hackathons for marine innovation; provide mentorship from technology and marine sector experts. - Train youth on operating drones to monitor beaches, track pollution, monitor boat movements, or even assist in search and rescue operations; analyze visual data and submit reports. - Train youth on installing and maintaining solar panels or small wind turbines to generate electricity for coastal homes or small fishing boats; provide loans for purchasing equipment. - Encourage youth to design and assemble simple sensors to measure water quality, temperature, or salinity; use these sensors to collect environmental data.	- Establish regional innovation centers to encourage joint scientific research and product development. - Facilitate technology transfer between universities, research institutions, and companies. - Develop joint marketing platforms to promote value-added marine products. - Unify quality and safety standards to ensure regional and international acceptance of products.

Project Name	Education and Capacity Building Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
- Support for schools and universities, availability of marine experts, attractive and interactive educational programs. - Specialized trainers in entrepreneurship, practical training materials; linking participants to funding and mentorship opportunities. - Skills in graphic design and content writing, knowledge of marine concepts. - Use of diverse media.	- Establish marine science clubs in schools and universities, organize field trips to coastal areas and protected areas, host lectures from experts, organize small competitions and research projects. - Create a platform (application and website) to increase awareness and knowledge of the marine environment and its importance. - Organize intensive workshops to teach youth how to transform their Blue Economy ideas into viable projects, provide business models, feasibility studies, and marketing skills.	- Establish a regional network for research and educational institutions to exchange students, professors, and expertise. - Joint research projects to address regional marine challenges (e.g., climate change, pollution). - Develop regional scholarship programs to support youth in marine specializations. - Unify accreditation standards for marine educational and training programs.

Project Name	Monitoring, Surveillance, and Marine Policy Building Projects

Success Factor	How to Implement the Project Locally	How to Implement the Project Regionally
- Use of satellites, drones, and smart sensors. - Capacity Building: Training youth on colletcting and analyzing marine data. - Collaboration with research institutions to ensure data accuracy and interpretation. - Support projects focused on monitoring and evaluation. - Establish a regional platform to provide specialized and systematic consulting services in "policy facilitation" using innovative tools and techniques and ensuring comprehensive policies that consider the interests of all parties.	- Presence of youth competencies in data collection, analysis, and design. - Provide infrastructure of monitoring and analysis devices and software. - Use early warning systems for coastal disasters. - Apply a structured process for gathering input and engaging various stakeholders (fishermen, businesses, civil society, researchers) in the process of developing policies related to marine and coastal resources. - Develop an intensive and specialized training program (interactive workshops, policy simulations and modeling, field visits) specifically aimed at policymakers and government officials concerned with Blue Economy sectors.	- Establish a regional network of monitoring centers to collect and exchange data in real-time. - Establish a regional data bank for climate and coastal information. - Design joint training programs for youth on using modern monitoring techniques. - Develop regional data platforms for sharing information on marine environmental health. - Coordinate rapid response to transboundary environmental incidents. - Raise the level of awareness, knowledge, and analytical capabilities of policymakers, enabling them to formulate more effective, sustainable, and adaptable policies. - Enhance institutional capacities in Blue Economy management, and achieve better environmental and economic governance.

11 Key Findings/Main Results

• Theoretical literature provides a rich framework for understanding the complexities of the Blue Economy, emphasizing the importance of sustainability, innovation, and inclusivity. However, more research is needed that directly links entrepreneurship, youth participation, and the unique conditions of Yemen, the Gulf States, and the coastal states in the region.

• The Blue Economy represents a strategic opportunity for Yemen, the Gulf States, and the Arab coastal states, as it is a driver for economic diversification, food security, and creating sustainable livelihoods, while preserving marine ecosystems.

• Youth in this region emerge as a pivotal driving force for this transformation, driven by their increasing awareness of sustainability issues and their innate ability for technological innovation.

• Promising opportunities in key sectors such as sustainable fisheries, aquaculture, marine ecotourism, renewable energy, and marine technology highlight immense youth entrepreneurial potential.

• Case studies, such as solar-powered fish processing plants in Yemen and youth-led ocean cleaning robots in the UAE, have demonstrated the ability of youth technological innovation to create dual economic, environmental, and social impact.

• Despite their growing ambition and interest in sustainability and innovation, youth face challenges in specialized skills and entrepreneurship. These gaps are clearly evident in advanced fields such as artificial intelligence and marine biotechnology, hindering the exploitation of their potential in emerging Blue Economy sectors.

• Collecting unified and up-to-date statistics on startups in Gulf countries faces a challenge due to differing data collection and classification methods among labor ministries. However, the region is witnessing significant government support, advanced digital infrastructure, and growth in funding, with expectations of billion-dollar startups emerging by 2030. Ongoing challenges include access to talent and the unification of regulatory frameworks.

• Access to finance is a major challenge for young entrepreneurs in the Blue Economy in the region. Therefore, overcoming this obstacle requires adopting innovative financial tools and models that reduce risks for private investors, such as blended finance, first-loss guarantees, and specialized blue funds that understand the unique nature of marine projects.

• The disparity between regional and international practices shows significant opportunities for mutual learning. While regional countries focus on basic capacity building and job localization in traditional sectors, international practices highlight the importance of investing in research and development, advanced technologies, and innovative solutions with broad environmental impact, to effectively promote youth entrepreneurship in the Blue Economy.

• Case studies demonstrate the immense potential of youth entrepreneurship in the Blue Economy, emphasizing that investment in STEM education, digital literacy, and providing technological infrastructure is crucial for the development of this sector.

• The differences in experts' responses generally reflect the developmental and geopolitical contexts of each region. While the Gulf States strive for global leadership in innovation within the Blue Economy, Yemen focuses on recovery and basic capacity building, while Egypt and Jordan are on a path that combines growth and sustainability with a focus on available resources. Nevertheless, points of agreement on common challenges and solutions are evidence of the potential for effective regional cooperation.

• The proposed framework in this paper is an essential step towards building a strategic and integrated ecosystem that effectively supports youth leadership in the Blue Economy. Through these pathways – including appropriate funding, continuous training, favorable policies, and strategic partnerships – the creative energies of youth can be harnessed to drive and lead sustainable blue development, achieving comprehensive prosperity for coastal communities and marine environments in the region and beyond.

• Aggregated regional resources constitute a vital strategy for bridging technological and funding gaps, as countries can overcome individual challenges (such as skill gaps, SME funding, and limited R&D outputs) by pooling expertise and resources. This allows for the creation of regional innovation platforms that provide access to advanced technologies and specialized mentorship, in addition to regional investment funds to reduce risks.

• Encouraging technological innovation is key to building a prosperous and sustainable future for coastal communities in Yemen, the Gulf States, and the Red Sea littoral states. Youth are the natural leaders of this transformation, and by empowering them, the region can unleash the potential of its seas to achieve a better future for all. Investing in youth entrepreneurship in the Blue Economy is not just an option, but a strategic necessity to build resilient economies, prosperous communities, and a healthy marine environment for future generations.

• To foster entrepreneurship and enhance full youth participation in the Blue Economy, strategic efforts must focus on four main pillars: (1) enhancing a supportive environment for marine entrepreneurship through clear regulatory frameworks, expanding specialized business incubators and accelerators, and strengthening effective partnerships between the public and private sectors; (2) developing capabilities and skills through specialized educational and training programs that bridge specific skill gaps in technical and scientific fields, with a focus on experiential learning and mentorship; (3) providing innovative financing mechanisms that go beyond traditional banking restrictions, and utilize blue finance tools such as blue bonds and blended finance to reduce risks and attract private investment; (4) emphasizing the importance of regional cooperation as a pivotal factor in stimulating innovation and entrepreneurship. These initiatives can include establishing regional innovation and cooperation platforms, developing a youth-led regional Blue Economy fund, knowledge exchange and capacity building programs, enhancing youth participation in regional ocean governance, and launching joint campaigns for marine environmental conservation.

12

Strategic Recommendations for Empowering Youth in Marine Entrepreneurship and Sustainable Initiatives

Based on a comprehensive analysis of the literature, the current state of the Blue Economy, promising sectors, best practices and lessons learned, and expert insights, this document provides strategic and executive recommendations directed at key stakeholders to promote entrepreneurship and youth engagement in the Blue Economy in Yemen, the Gulf States, and the Red Sea littoral states. These recommendations constitute a comprehensive approach that requires coordinated and multilateral effort, coordination among relevant ministries, and the involvement of all stakeholders to ensure their effectiveness and sustainability.

Table 6: Strategic and Practical Recommendations for Empowering Youth in Marine Entrepreneurship and Sustainable Initiatives

Responsible Entity for Recommendation

12.1 Recommendations Directed at Policymakers and Governments in the Region

Recommendation Area	Recommendation	Implementing Body - Action	Objective
A. Developing Legislative and Regulatory Frameworks:	1. Preparing unified and clear legal and regulatory frameworks:	Governments, especially in GCC countries, should formulate and unify legal and regulatory frameworks for the sustainable Blue Economy.	Ensuring a balance between economic activities and marine environmental protection, and providing legal certainty for local and international investors and young entrepreneurs.
	2. Formulating integrated national and regional strategies:	Governments, academic institutions, and other entities should develop and implement comprehensive national and regional strategies for the Blue Economy.	Integrating youth entrepreneurship, environmental sustainability, and economic diversification as key objectives, providing clear guidance, reducing regulatory barriers, and offering targeted incentives for sustainable business practices and innovation.
	3. Simplifying bureaucratic procedures:	Government agencies and local organizations should work to simplify bureaucratic procedures and facilitate obtaining licenses and permits for startups and small projects in the marine sector.	Accelerating the launch and growth of these projects.
	4. Involving youth in policy formulation:	Governments, organizations, and official bodies should activate the role of youth in marine and environmental policy formulation committees.	Ensuring their effective representation in advisory committees and working groups that develop Blue Economy strategies, and benefiting from their innovative ideas.
B. Investing in Marine Infrastructure and Technologies: Strategic investment in infrastructure and modern technologies is a fundamental pillar for enhancing the Blue Economy's capacity for growth and innovation.	1. Modernizing marine infrastructure:	Ministries of Transport, Planning, and Investment should modernize ports and develop logistical infrastructure.	Supporting the shipping, marine tourism, and logistics sectors.
	2. Investing in renewable energy-powered desalination plants:	Ministries of Energy, Water, and Environment should invest in establishing and operating desalination plants that operate entirely on renewable energy sources.	Providing clean water for coastal communities and marine industrial activities sustainably.
	3. Allocating specialized marine industrial zones:	Urban and industrial planning authorities should establish and allocate specialized marine industrial zones.	Supporting innovation and production in emerging Blue Economy sectors such as marine biotechnology and advanced marine equipment manufacturing.
	4. Improving data infrastructure:	Relevant government agencies should develop reliable public data infrastructure, including credit bureaus and business registries. Ministries of Communications and research entities should enhance knowledge and data exchange between countries and institutions to support innovation and scientific research.	Supporting data-driven lending for SMEs.
C. Stimulating Investment and Providing Funding: Governments and development finance institutions must actively work to create a more attractive investment environment for the Blue Economy through innovative risk-sharing mechanisms and providing catalytic capital.	1. Providing attractive investment incentives:	Investment authorities should offer attractive investment incentives (e.g., golden licenses, tax exemptions, residency facilities).	Attracting to the region international companies and talent specialized in the Blue Economy.
	2. Developing alternative financing mechanisms:	Central banks and government financial institutions should develop alternative financing mechanisms. Government loan guarantee programs would reduce risks for banks and financial institutions and encourage them to lend to youth projects in this vital sector.	Addressing the SME funding gap, which often faces traditional banking restrictions (such as high collateral requirements).
	3. Offering tax incentives and regulatory privileges:	Ministries of finance and economy should provide financial incentives and administrative facilities for companies that employ youth and invest in sustainable Blue Economy projects.	Encouraging the creation of an attractive environment for young entrepreneurs and increasing employment opportunities.
	4. Encouraging investment in early-stage startups:	Government development funds and national business accelerators should support investment in early-stage startups (pre-seed and seed stage).	Activating the role of individual investors and venture capital firms to attract private funding to support promising startups and provide cash investments and integrated support programs for these companies.
	5. Mobilizing innovative financial instruments (Blue Finance):	Ministries of finance, environment, and development partners should use innovative financial instruments such as blue bonds, debt-for-nature swaps, and blended finance.	Reducing perceived risks and attracting private investment, with a special focus on "blue carbon" projects that attract environmental finance.
	6. Utilizing sovereign wealth funds:	Boards of directors of GCC sovereign wealth funds should direct a portion of their investments towards the Blue Economy and youth-led projects.	Diversifying investments and supporting sustainable development, with clear mechanisms for assessing the environmental and social impact of these projects.
	7. Establishing dedicated youth financing funds:	Governments and development institutions should establish dedicated sovereign or private funds to support youth in the Blue Economy.	Providing soft loans, grants, and seed funding for youth-led startups, with favorable terms that consider the nature of small projects and their initial risks.

Responsible Entity for Recommendation

12.2. Recommendations Directed at Academic Institutions, Institutes, and Government and Private Training Centers

Recommendation Area	Recommendation	Implementing Body - Action	Objective
A. Developing Specialized Education and Training Programs: Developing human capital in the Blue Economy is a top priority for bridging the skills gap and empowering youth.	1. Designing specialized educational and vocational programs:	Ministries of higher education, scientific research, technical education, and vocational training should design educational and vocational programs that focus on sustainability and 21st-century skills.	Ensuring equitable access for all youth, integrating "green jobs" skills into curricula, supporting experiential learning, and developing programs to connect youth with education, training, and leadership opportunities in the sustainable Blue Economy (such as "Blue Futures Pathways").
	2. Providing targeted vocational and technical training:	Specialized vocational and technical training centers and academic institutions should offer practical training programs (internships) and project simulations. This includes providing practical training opportunities in companies and institutions operating in the marine sector, and organizing workshops and simulations for marine entrepreneurship projects to equip youth with practical experience.	Bridging gaps in required practical skills, as youth may lack practical experience and specialized knowledge in complex marine sectors. For example, supporting programs like the SFISH project in Yemen, which supports vocational training in the fisheries sector.
	3. Bridging qualitative skill gaps:	Universities, research centers, and industrial institutions should focus on developing talent in marine biotechnology, artificial intelligence, marine data analytics, and robotics.	Bridging clear gaps in these areas and encouraging cooperation between universities and industrial institutions to develop programs that meet market needs.
	4. Mentorship and guidance programs:	Government and private educational institutions should provide individual mentorship and guidance from industry experts to young entrepreneurs.	Supporting the growth of their projects, and benefiting from models such as "Silatech" programs in Yemen, which provide mentorship and support for startups.
	5. Lifelong learning and continuous professional development:	Educational institutions and relevant government agencies should develop executive education programs and lifelong training for youth in Blue Economy fields.	Enhancing career paths for youth in ocean sciences and renewable Blue Economy sectors.
B. Investing in Research and Development Directed Towards Regional Challenges:	1. Directing research towards innovative solutions:	Academic institutions, research centers, and the private sector should direct research towards innovative solutions for specific challenges in the region.	Addressing issues such as water scarcity, coral reef degradation, and developing sustainable fishing technologies that adapt to local conditions.
	2. Supporting targeted research and development (R&D):	International organizations and the private sector, in partnership with academic institutions, should allocate budgets for applied research led by youth in Blue Economy fields.	Developing marine energy technology, innovative aquaculture, and solutions for marine pollution treatment.
	3. Designing and implementing specialized academic and vocational postgraduate programs:	Universities and technical institutes should design and implement academic and vocational programs at the master's and doctoral levels focusing on modern Blue Economy specializations.	Preparing youth for the labor market in fields such as ocean engineering, aquaculture technology, marine renewable energy, marine biotechnology, integrated coastal management, and sustainable marine tourism.

Responsible Entity for Recommendation

12.3. Recommendations Directed at All Actors (Private Sector, International Organizations, Civil Society)

Recommendation Area	Recommendation	Implementing Body - Action	Objective
A. Enhancing Mentorship Programs and Specialized Incubators:	1. Providing mentorship for young entrepreneurs:	Large companies, experts in the marine sector, and civil society should provide mentorship for young entrepreneurs.	All actors have a shared responsibility in supporting and empowering youth to be leaders in the sustainable Blue Economy. Transferring practical experiences and knowledge.
	2. Designing intensive Mentorship Networks:	International organizations and civil society should design intensive mentorship networks and platforms.	Connecting ambitious youth with successful and experienced leaders, experts, and entrepreneurs in the marine sector, with a focus on cross-border mentorship networks for knowledge exchange.
	3. Developing specialized business incubators and accelerators:	The private sector, international organizations, and academic institutions should establish and develop innovation hubs and specialized business incubators and accelerators in the Blue Economy.	Providing a stimulating environment for youth to develop their ideas, with guidance, training, tools, and access to technical resources and specialized laboratories, and focusing on advanced technologies such as artificial intelligence.

Recommend-ation Area	Recommend-ation	Implementing Body - Action	Objective
B. Supporting Public Awareness Campaigns on the Importance of the Blue Economy and Sustainability:	1. Use various media in awaresness campaigns:	All actors (private sector, civil society, international organizations) should use various media (television, radio, social media, community events).	Spreading awareness of the importance of oceans and their role in our daily lives, and encouraging individuals and communities to adopt sustainable practices, with a focus on inspiring stories of young entrepreneurs, as youth may not be fully aware of the diverse opportunities offered by the Blue Economy beyond traditional activities.
C. Facilitating Access to Technology and Knowledge:	1. Technology and expertise transfer: 2. Connecting	International organizations, academic institutions, and the private sector should work to transfer technology and expertise to countries in the region.	Facilitating access to databases and information related to marine sciences and modern innovations.
	youth with global marine innovation networks:	Academic and international organizations should facilitate youth participation in international conferences, specialized workshops, and cultural exchange programs.	Informing them about the latest global developments in the Blue Economy and building international relationship networks.

Responsible Entity for Recommendation

12.4. Recommendations Directed at Youth Leaders and Organizations

To transform youth from mere participants into influential leaders and active entrepreneurs in building the Blue Economy, a strategic multi-dimensional approach is required, focusing on building their capacities, facilitating their access to resources, and fostering an innovation environment.

Recommend-ation Area	Recommend-ation	Implementing Body - Action	Objective
A. Building Strong Networks for Young Blue Economy Entrepreneurs:	1. Establishing online platforms and regular events:	Youth leaders and organizations should initiate the establishment of online platforms and regular events (e.g., conferences, hackathons, workshops).	Connecting young entrepreneurs with each other, and with experts, investors, and industry players, with a focus on regional cooperation and exchange of experiences and knowledge.
B. Advocating for Youth-Supportive and Blue Economy Policies:	1. Forming youth advocacy groups:	Youth leaders and organizations should form organized and effective youth advocacy groups.	Working with policymakers to ensure the inclusion of youth priorities in Blue Economy strategies and legislation.
	2. Changing the stereotype of marine jobs:	Youth organizations and youth-affiliated media groups should highlight sustainable and innovative career opportunities in the Blue Economy.	Breaking the traditional image of routine fishing or navigation jobs, and sharing inspiring success stories of young entrepreneurs through media and social media platforms to encourage and motivate others.
C. Continuous Development of Personal and Professional Capacities:	1. Seeking training and mentorship opportunities:	Young individuals and youth organizations should continuously seek training opportunities, educational courses, and mentorship programs.	Developing skills in technical, managerial, and entrepreneurial fields related to the Blue Economy.
	2. Developing specialized leadership programs:	Youth organizations should design and develop specialized leadership and entrepreneurship programs.	Equipping youth with essential leadership skills, managing complex projects, strategic thinking, effective negotiation, and constructive communication in the context of the Blue Economy.
	3. Developing green and blue skills:	Youth organizations should organize workshops and training courses focusing on developing green and blue skills.	Training youth in sustainable techniques and practices in marine sectors, such as responsible fishing methods, offshore renewable energy technologies, marine waste management, and assessing the environmental impact of marine projects.
D. Focusing on Sustainability and Social Impact in Entrepreneurial Projects:	1. Integrating sustainability principles:	Young entrepreneurs and supporting organizations should ensure that youth projects in the Blue Economy are not only profitable but also contribute to protecting the marine environment, providing decent job opportunities, and supporting local communities.	Achieving comprehensive development.
	2. Adopting circular economy practices:	Young entrepreneurs should focus on adopting circular economy practices in their projects.	Reducing waste and transforming it into valuable resources (e.g., recycling marine waste, or converting fish waste).

Recommendation Area	Recommendation	Implementing Body - Action	Objective
E. Participation in the Most Suitable Investment Sectors in the Blue Economy According to the Region:	1. Participation in investment activities most suitable for the geographical region.	Forming youth groups in the region's countries that work with policymakers to ensure that investments rely on the best available local capacities, to create sustainable job opportunities for youth.	Ensuring that any investment strategy is integrated and sustainable. They must consider youth active partners in development and investment in small, environmentally responsible tourism projects managed by the local community. This does not require large initial investments, and benefits from the passion of youth for preserving their environment.
	2. Investing in recovery and basic infrastructure.	The Yemeni government should integrate youth participation in the Blue Economy within national reconstruction plans, especially in affected coastal areas, and allocate resources for this. International, regional, and local organizations should provide immediate and sustainable support for youth-participating reconstruction programs.Youth leaders should identify youth priorities and needs in affected areas.	In Yemen.
	3. Investing in innovation and advanced technologies.	For governments, youth investments should focus on high value-added sectors that benefit from technological advancements. These include offshore renewable energy, marine biotechnology, smart ports, and innovative marine logistics, providing opportunities in research and development and engineering technologies.	In the GCC.
	4. Investing in enhancing regional and international cooperation and in traditional sectors, while also integrating sustainable practices and modern technologies in the Red Sea littoral states.	Governments and regional organizations (e.g., League of Arab States, COMESA, etc.) should develop joint training programs among Red Sea littoral states to unify standards and exchange experiences and trainers. Academic and vocational institutions should design and implement these programs. Youth leaders shouldparticipate in coordination committees for these programs.	Youth investments should focus on leveraging regional and international cooperation. The focus here should include developing sustainable fisheries and improving the value chain, coastal eco-cultural tourism, and marine environmental protection and monitoring projects using modern technologies (drones, robots). This includes building and repairing eco-friendly or clean energy-powered boats, creating opportunities in technical and craft skills.

Responsible Entity for Recommendation

12.5. Special Recommendations for Policymakers in Yemen:

Given the special circumstances in Yemen, these recommendations require a focus on recovery and reconstruction.

Recommendation Area	Recommendation	Implementing Body - Action	Objective
General	1. Preparing a comprehensive national strategy for the Blue Economy:	Once the situation stabilizes, the Yemeni government should formulate a comprehensive national strategy for the blue economy.	Include clear targets and measurable performance indicators, with a particular focus on youth participation at all stages of planning and implementation.
	2. Rehabilitating damaged marine infrastructure:	The Yemeni government, in collaboration with development partners, should prioritize the reconstruction of ports, fish landing centers, and storage and refrigeration facilities.	Supporting livelihoods and enhancing food security.
	3. Launching intensive and targeted vocational training and qualification programs for youth:	The Ministry of Technical Education and Vocational Training (TVET), in partnership with international organizations such as UNDP and FAO, and regional expertise, should launch intensive and targeted vocational training and rehabilitation programs for youth.	Focus on skills required in vital marine sectors such as sustainable fishing, aquaculture, marine equipment maintenance, and marine environmental safety and management.
	4. Supporting youth-led small and medium-sized enterprises:	Development funds and local banks should provide soft loans, technical support packages, and guidance.	Facilitate administrative and legal procedures for establishing youth-led maritime businesses.
	5. Activating and implementing laws and legislation related to marine environmental protection:	The judicial and executive authorities shall activate and apply laws and legislation related to the protection of the marine environment.	Combating overfishing and pollution in all their forms to preserve resources for future generations and ensure their sustainability.

Responsible Entity for Recommendation

12.6. Special Recommendations for Policymakers in the Gulf and Red Sea Littoral States:

These recommendations focus on enhancing innovation, advanced technologies, and supporting regional integration.

Recommend-ation Area	Recommend-ation	Implementing Body - Action	Objective
General	1. Increasing investment in specialized education and training for youth:	Ministries of Education, academic entities, and the private sector should increase investment in specialized education and training programs for youth.	Developing competencies in modern and advanced Blue Economy specializations, such as advanced marine engineering, marine biotechnology, smart port management, marine renewable energy, marine protected area management, and marine logistics.
	2. Encouraging youth entrepreneurship in the marine sector:	Governments and project support agencies should provide specialized business incubators and support funds.	Facilitating access to finance and venture capital for promising youth-led projects.
	3. Developing a flexible and supportive legislative and regulatory framework for the sustainable Blue Economy:	Legislative and regulatory bodies should develop a flexible and supportive framework.	Facilitating responsible investment, protecting the marine environment, and encouraging innovation, research and development in the sector.
	4. Enhancing effective partnerships:	Governments should encourage and enhance effective partnerships between the public and private sectors, academic institutions, and research centers.	Linking educational outputs with labor market needs in the Blue Economy and ensuring youth are equipped with the necessary skills and knowledge.
	5. Integrating Blue Economy concepts into educational curricula:	Ministries of education should integrate Blue Economy concepts into educational curricula starting from early stages.	Increasing youth awareness of the importance of oceans and seas and the promising economic opportunities available therein.
	6. Launching continuous and wide-ranging national awareness campaigns:	Government and media entities should launch continuous and wide-ranging national awareness campaigns.	Introducing diverse and future career opportunities in the Blue Economy, the importance of preserving the marine environment, and highlighting inspiring success stories of youth in this sector.
	7. Enhancing youth participation in regional ocean governance:	Governments and regional organizations should effectively involve youth in formulating regional marine strategies and policies.	Establishing specialized youth advisory bodies in the Blue Economy to provide recommendations to government agencies and regional organizations, ensuring the integration of youth perspectives into decision-making processes.

13 Roadmap for Enhancing Youth Participation in the Blue Economy

This roadmap serves as a strategic framework to enhance youth participation in the Blue Economy and link key recommendations with specific funding entities to adopt youth ideas, contributing to sustainable development and economic prosperity in Yemen, the Gulf States, and the Red Sea littoral states. The roadmap focuses on specialized education, supportive policies, innovation and entrepreneurship, accessible finance, and effective awareness. Investing in youth is an investment in the region's marine future.

13.1. Strategic Vision:

"Empowering a generation of aware, trained, and innovative youth to become leaders and active contributors to the development of the Blue Economy."

13.2. Strategic Pillars of the Roadmap:

The roadmap is based on five essential pillars that have been detailed to ensure a comprehensive and integrated approach to empowering youth participation in the Blue Economy:

Table 7: Essential Pillars of the Roadmap for Enhancing Youth Participation in the Blue Economy

PILLAR ONE		
Education, Capacity Building, and Skills Development		
Objective: Equipping youth with specialized knowledge and practical skills necessary for effective participation in diverse and future-oriented Blue Economy sectors.	Action	Include basic concepts about the marine environment, the importance of oceans, and Blue Economy principles in primary and secondary education curricula to increase early awareness.
		Establish and develop specialized academic programs (bachelor's, master's, doctorate) in Blue Economy fields.
		Establish or strengthen vocational and technical training centers that offer internationally recognized certifications in in-demand marine professions (e.g., vessel maintenance technicians, commercial rescue divers, marine equipment operators, marine ecotourism guides, aquaculture technicians).
		Provide short, intensive training courses focusing on Green Skills related to the sea, such as: marine waste management, sustainable fishing techniques, water quality monitoring, and offshore solar energy technologies.
		Encourage close cooperation between universities, research centers, and companies operating in the marine sector to design educational programs that meet market needs, and provide practical training opportunities (Internships) for students.
		Launch mentorship programs that connect students and youth with professionals and experts in the Blue Economy to exchange experiences and knowledge.
		Facilitate student and faculty exchange programs between educational institutions in the region to enhance knowledge exchange and best practices.
		Develop E-learning platforms that provide training courses and educational resources on the Blue Economy, allowing flexible access for youth in remote areas.
		Encourage the concept of lifelong learning by providing continuous skill updating courses and professional certifications.

PILLAR TWO

Policies, Regulatory, and Legislative Frameworks

Objective:

Creating a stimulating and supportive legal and regulatory environment to enable youth to participate effectively and safely in the Blue Economy.

Action

- Develop clear and comprehensive national strategies for the Blue Economy that include specific objectives and key performance indicators for youth participation in various marine sectors.
- Include youth as active members in committees for drafting policies and legislation related to marine sectors to ensure their perspectives are represented.
- Enhance regional cooperation to develop joint policy frameworks that support the Blue Economy across borders.
- Provide tax incentives, customs exemptions, and credit facilities for companies that employ recent graduates or are led by youth in Blue Economy sectors.
- Allocate quotas or priority for startups and youth-led projects in major government tenders and projects related to the sea.
- Simplify and facilitate procedures for registering youth-owned startups in marine sectors and reduce bureaucracy.
- Establish clear legal frameworks for protecting the intellectual property of youth innovations and projects in the Blue Economy.
- Develop legislation that supports investment in modern and sustainable marine technologies.
- Apply principles of transparency and accountability in the management of marine resources and Blue Economy projects.
- Enhance the role of regulatory institutions to ensure compliance with environmental and marine legislation.

PILLAR THREE

Innovation and Entrepreneurship

Objective:

Stimulating youth creativity, developing innovative solutions, and establishing their own projects that contribute to the growth of the Blue Economy.

Action

- Establish and activate specialized business incubators and accelerators in the Blue Economy, providing technical, administrative, and logistical support for youth startups.
- Provide co-working spaces and innovation centers equipped with the latest technologies for youth interested in the marine sector.
- Provide Prototyping Labs for developing and testing innovative ideas.
- Connect young entrepreneurs with mentors who have extensive experience in the marine sector, successful business professionals, and investors.
- Organize intensive workshops on Business Model Canvas, Design Thinking, and project management.
- Launch periodic national and regional competitions for the best innovative youth ideas and projects in the Blue Economy (e.g., solutions for marine pollution, sustainable fishing techniques, smart navigation applications).
- Provide financial prizes, technical support, and incubation opportunities for winning projects.
- Organize hackathons and "Innovation Camps" to enable youth to develop rapid solutions for marine challenges.
- Support research projects led by youth in areas such as marine biotechnology, new materials extracted from the sea, and marine energy.
- Encourage cooperation between universities and the private sector to market marine innovations.

PILLAR FOUR

Funding and Investment

Objective:

Facilitating youth access to diverse funding sources necessary to start and expand their projects in the Blue Economy.

Action

- Establish national or regional funds dedicated to supporting youth projects in the Blue Economy, with a focus on projects with a positive environmental and social impact.
- Allocate a portion of national and regional development budgets to support youth-led marine projects.
- Cooperate with banks and financial institutions to provide soft loans with low interest rates and reduced collateral for young entrepreneurs.
- Develop microfinance mechanisms for small projects in coastal areas, with a focus on local communities.
- Launch loan guarantee programs that reduce risks for banks when financing youth projects.
- Encourage foreign direct investment and local investment in Blue Economy sectors that provide opportunities for youth, such as large-scale aquaculture and marine energy.
- Organize specialized investment forums to connect young entrepreneurs with potential investors (venture capitalists, angel investors, impact investors).
- Develop public-private partnership (PPP) mechanisms to support major youth projects.
- Provide workshops and training courses for youth on financial planning, preparing feasibility studies, and how to attract funding.
- Provide information platforms on available funding opportunities.

PILLAR FIVE

Awareness, Advocacy, and Community Participation

Objective:

Increasing public awareness of the importance of the Blue Economy and the role of youth in it, enhancing their active participation in decision-making processes and marine environmental protection.

Action

- Launch wide-ranging media and awareness campaigns through various channels (television, radio, newspapers, social media, community events) to highlight Blue Economy opportunities and their importance for the future.
- Use inspiring stories of successful young entrepreneurs in the marine sector as role models.
- Organize community events and interactive workshops in coastal areas to introduce youth to Blue Economy opportunities.
- Organize regional and national youth forums and conferences focusing on the Blue Economy, to provide a platform for exchanging ideas, experiences, and challenges.
- Invite youth to actively participate in international conferences and events related to oceans and seas.
- Establish Youth Blue Economy Councils to ensure youth voices are represented in national and regional dialogues.
- Support the establishment of specialized youth networks and organizations that advocate for youth and marine environmental issues.
- Provide digital platforms for youth to express their opinions, suggestions, and projects to policymakers and the public.
- Launch the Youth Blue Economy Ambassadors program to train youth in awareness and advocacy.
- Encourage youth to participate in citizen science programs related to marine environmental monitoring, such as collecting data on pollution or coral reef health.
- Organize beach and marine environment cleanup campaigns with broad youth participation to foster a sense of responsibility.

13.3 Key Stakeholders and Enhancing Roles:

Implementing this roadmap requires concerted efforts and close cooperation among many parties, with more detailed roles defined:

Table 9: Key Stakeholders and Their Roles in Enhancing Youth Participation in the Blue Economy

Responsible Entity		Roles and Responsibilities
Governments and Official Bodies	Role	Formulating comprehensive policies and strategies, providing advanced infrastructure, allocating financial and human resources, facilitating procedures, ensuring maritime security, and protecting the environment.
	Responsibility	Involving youth in decision-making processes, and providing a stimulating legal and legislative environment.
Private Sector and Large Companies	Role	Investing in Blue Economy projects, providing decent job opportunities for youth, partnering with educational institutions in training programs, adopting youth innovations, and developing sustainable value chains.
	Responsibility	Supporting youth entrepreneurship and providing mentorship.
Educational and Research Institutions	Role	Developing modern curricula, providing vocational and technical training, conducting applied research that serves Blue Economy sectors, and providing technical expertise.
	Responsibility	Linking education to labor market needs and providing opportunities for youth research and innovation.
Civil Society Organizations and NGOs	Role	Raising awareness, building youth capacities, supporting youth initiatives, implementing marine environmental protection projects, and advocating for youth and Blue Economy issues.
	Responsibility	Acting as a bridge between youth, policymakers, and local communities.
Financial Institutions and Banks	Role	Providing necessary funding, soft loans, microfinance mechanisms, and developing innovative financial products to support youth projects in the Blue Economy.
	Responsibility	Facilitating access to finance and reducing financial risks for youth.
Regional and International Organizations	Role	Providing technical and financial support, facilitating the exchange of experiences and best practices between countries, enhancing regional cooperation, and supporting joint research.
	Responsibility	Providing platforms for dialogue and international cooperation in the Blue Economy.
Youth Themselves	Role	Initiative, innovation, continuous learning, active participation in policy formulation, project establishment, and contributing to marine environmental protection.
	Responsibility	Being leaders of change and drivers of sustainable development.

13.4 Implementation Plan for the Roadmap:

The implementation strategy can be divided into overlapping phases, with a focus on flexibility and adaptation to changing conditions in each region. Implementing this roadmap requires the execution of several projects and initiatives, with concerted efforts and close cooperation among multiple parties, and more detailed roles defined for each. Continuous monitoring and evaluation are necessary to ensure the effectiveness of the roadmap and the achievement of its objectives. Measurable key performance indicators (KPIs) must be established. Table (9) illustrates all the details of the roadmap, as follows:

Table 9: Implementation Plan for the Roadmap to Enhance Youth Participation in the Blue Economy.

Phase One:	Suggested Duration	Objective:
Capacity Building and Awareness (Knowledge and Skill Foundation)	1–2 years	Establishing a solid knowledge and skill base for youth regarding the Blue Economy.

Key Activities	Actions			For Whom? (Responsible Entity). How? (Application).	Key Performance Indicators (KPIs)
1. Developing specialized training curricula:	**- Content:** Covering areas such as sustainable fisheries, aquaculture, marine ecotourism, marine renewable energy, marine waste management, marine biotechnology, sustainable maritime transport, and marine environmental protection.	**-Implementation:** In cooperation with universities, technical institutes, and specialized research centers.	**- Output:** Accredited training programs and digital and printed educational resources.	Governments (Ministries of Education): Lead the process of integrating Blue Economy and marine sustainability concepts into educational curricula from early stages to higher education. Academic, Scientific, Technical, and Vocational Institutions: Design and develop specialized courses and curricula (e.g., sustainable fisheries, marine ecotourism, marine renewable energy, marine information technology). Private Sector: Provide input on required skills in marine industries to ensure curriculum relevance to the labor market. Youth Leaders: Contribute to identifying youth's educational and training needs. International and Local Organizations: Provide technical and financial support for curriculum development and teacher training.	• Number of youth who completed accredited training programs. • Level of increase in Blue Economy awareness (pre- and post-campaign surveys). • Number of academic and training partnerships established.
2. Organizing national and regional awareness campaigns:	**- Means:** Interactive workshops, seminars, conferences, media campaigns (visual, audio, and print), and use of social media.	**- Focus:** Highlighting economic opportunities, environmental importance, and the role of youth in achieving ocean-related Sustainable Development Goals (SDG 14).	**- Outcome:** Increased general and youth awareness of the Blue Economy.	Governments: Launch comprehensive national awareness campaigns. Academic and Scientific Institutions: Disseminate research and knowledge about Blue Economy opportunities. Civil Society Organizations: Organize workshops and community events to raise awareness. Youth Leaders: Use their platforms to raise awareness among their peers and inspire them. Private Sector: Highlight available career and professional opportunities. International, Regional, and Local Organizations: Support awareness campaigns and provide educational resources.	
3. Organizing workshops and summer camps:	**- Means:** Workshops, summer camps, which can be implemented in cooperation with international and local organizations to increase outreach.	**- Focus:** Highlighting economic opportunities and the role of youth in achieving Blue Economy objectives.	**- Outcome:** Increased outreach and youth awareness of the Blue Economy.	Civil Society Organizations: Organize workshops and summer camps for youth to introduce them to Blue Economy opportunities and provide them with basic skills. Schools and Universities: Host these events and help promote them. Youth Leaders: Participate in organizing and facilitating these workshops. Private Sector: Sponsor these events and provide experts for lectures. International and Local Organizations: Provide logistical and financial support.	
4. Building academic-industry partnerships:	**- Content:** Covering areas of training, research projects, and exchange of best practices.	**-Implementation:** In cooperation with universities, technical institutes, and the private sector.	**- Outcome:** Accredited training programs and digital and printed research projects.	Universities and Institutes: Form strategic partnerships with companies operating in the Blue Economy to design practical training programs and joint research projects. Private Sector: Provide paid internship opportunities for students and employ graduates. Governments: Provide incentives for these partnerships. International and Regional Organizations: Facilitate the building of these partnerships and the exchange of best practices.	

Main Activities	Actions			For Whom? (Responsible Entity). How? (Application).	Key Performance Indicators (KPIs)
5. Highlight success stories:	**- Content:** Presenting positive role models to be emulated and encouraging more youth to get involved.	**-Implementation:** In cooperation with media, organizations, and the private sector.	**- Outcome:** Availability of inspiring role models for youth.	Media and Civil Society Organizations: Highlight youth success stories in the Blue Economy through TV programs, articles, social media, and events. Youth Leaders: Share their stories and inspire others. Private Sector: Support initiatives that celebrate successful youth.	
6. Launching intensive vocational training programs:	**- Fields:** Modern aquaculture techniques, port maintenance and management, commercial and environmental diving, building and maintaining eco-friendly boats, and marine tourism guiding.	**- Methodology:** Integrating theoretical training with practical and field training.	**- Outcome:** Qualified youth cadres for the labor market in Blue Economy sectors.	Governments (Ministries of Labor, Vocational Education): Support the establishment and development of vocational training centers. Vocational and Technical Institutes: Launch training programs in aquaculture, vessel maintenance, port management, marine information technology, commercial diving, and marine waste management, with a focus on practical skills. Private Sector: Provide practical training opportunities and employment after training. Youth Leaders: Help promote these programs among their peers. International and Local Organizations: Provide financial and technical support for training centers.	
7. Establishing support and advocacy networks:	**- Content:** Establishing advocacy networks and platforms.	**-Implementation:** In cooperation with the private sector and organizations.	**- Outcome:** Availability of dialogue and advocacy platforms for youth issues in the Blue Economy.	Private Sector: Provide funding. Youth Leaders: Establish specialized Blue Economy networks and organizations that advocate for youth. International and Local Organizations: Provide technical support and promotion for advocacy campaigns and provide dialogue and advocacy platforms for youth.	

Phase Two:

Empowerment and Entrepreneurship (Transforming into Opportunities)

Suggested Duration

2–3 years

Objective

Supporting youth in transforming innovative ideas into sustainable economic projects.

Main Activities	Actions			For Whom? (Responsible Entity). How? (Application).	Key Performance Indicators (KPIs)
1. Establishing specialized Blue Economy incubators and accelerators:	**- Services:** Providing co-working spaces, expert mentorship and guidance, capacity building in business management, marketing, and finance, linking projects to investments.	**- Focus:** Projects that adopt innovative and sustainable solutions for marine challenges.	**- Outcome:** Increased number of economically and environmentally viable startups.	Governments (Incubators and Accelerators): Establish specialized Blue Economy incubators and accelerators to provide technical and advisory support, as well as training, for young entrepreneurs, alongside co-working spaces. Government Entities: Provide land or buildings for these incubators and offer incentives. Private Sector: Provide mentorship and investment in startups. International and Local Organizations: Support the establishment and operation of these incubators.	• Number of incubated and accelerated startups. • Volume of investments received by youth projects. • Number of job opportunities created thanks to youth projects. • Number of events and platforms that facilitated networking
2. Establishing revolving funding funds or soft loan programs for youth.	**- Objective:** Providing initial capital for small and medium-sized enterprises led by youth in the Blue Economy.	**- Partnerships:** Commercial banks, development funds, international financial institutions.	**- Outcome:** Facilitating youth access to necessary funding to start and expand their projects.	Banks and Development Funds: Establish dedicated funds or soft loan programs for youth projects in the Blue Economy, with flexible repayment terms and reduced collateral. Governments: Provide support for loan guarantees and facilitate access to them. International and Regional Organizations: Provide financial support and expertise in managing these funds. Youth Leaders: Help raise youth awareness of these opportunities.	
3. Developing networking and experience exchange platforms:	**-Means:** Digital forums, annual conferences, networking workshops, and mentorship programs that bring youth together with experts and seasoned businesspeople.	**- Objective:** Building a connected youth community in the Blue Economy.	**- Outcome:** Enhanced cooperation and knowledge exchange among youth and relevant entities.	Business Incubators and Chambers of Commerce: Organize events and meetings (e.g., Demo Days) that bring young entrepreneurs together with potential investors (angels, venture capitalists). Government Entities: Provide platforms for exchanging investment opportunities. Private Sector: Participate as investors or mentors. International and Regional Organizations: Facilitate access to regional and international investor networks.	

Main Activities	Actions			For Whom? (Responsible Entity). How? (Application).	Key Performance Indicators (KPIs)
4. Organizing Blue Economy competitions and innovation camps (hackathons):	**- Objective:** Stimulating youth to develop creative solutions for pressing challenges in the marine sector.	**- Prizes:** Financial support, incubation, training, and promotion opportunities.	**- Outcome:** Innovative and applicable ideas and solutions.	Technology Companies and Universities: Organize competitions and hackathons for youth to develop technological solutions to address Blue Economy challenges, and provide prizes and technical support. And evaluate submitted projects. Youth Leaders: Promote these competitions and participate in them. Government Entities and Private Sector: Sponsor competitions and provide incubation opportunities for winning projects. Launch grant and award programs for innovative youth projects. International and Regional Organizations: Support the organization of regional hackathons.	
5. Facilitating startup registration procedures:	**- Objective:** Removing bureaucratic obstacles for young entrepreneurs.	**- Prizes:** Legal and technical support	**- Outcome:** A unified window for youth entrepreneurship services.	Governments (Ministries of Commerce, Investment, Justice): Simplify and accelerate registration and licensing procedures for startups in the marine sectors, and establish unified windows for entrepreneurship services. Local Organizations: Provide legal assistance to youth in the registration process.	
6. Establishing marine innovation centers:	**- Services:** Providing innovation laboratories. Funding research.	**- Focus:** On sustainable solutions in the Blue Economy.	**- Outcome:** Increased number of innovation and research centers.	Research Centers and Universities: Establish innovation, research, and development centers focusing on sustainable solutions in the Blue Economy, and provide research infrastructure. Private Sector: Invest in these centers and fund applied research. Governments: Provide financial and legislative support for establishing these centers. Youth Leaders: Participate in research and development teams. International and Regional Organizations: Support international research cooperation.	
7. Supporting youth scientific research:	**- Services:** Providing funding, developing new marine products.	**- Focus:** On innovative solutions based on scientific knowledge.	**- Outcome:** Increased number of research grants.	Academic and Scientific Institutions: Provide funding and support for youth-led research in areas such as clean marine technology, marine environmental monitoring, and the development of new marine products, and encourage the publication of scientific findings. Governments: Allocate budgets for research and development. Private Sector: Fund research relevant to industry needs. International and Regional Organizations: Provide research grants.	
8. Technology transfer:	**- Services:** Accelerating the pace of development and innovation in the Blue Economy.	**- Focus:** On transferring technological knowledge and expertise.	**- Outcome:** Increased number of licensing programs and capacity building programs.	Governments and Research Centers: Facilitate the transfer of modern technology related to sustainable marine sectors to youth and entrepreneurs, through licensing and awareness programs. Private Sector: Transfer technological knowledge and expertise. International and Regional Organizations: Support technology transfer and capacity building programs in this field.	

Phase Three:

Policies, Monitoring, and Sustainability (Long-term Growth).

Suggested Duration

Continuous after 5 years

Objective

Ensuring the continuity of initiatives, measuring impact, and developing a supportive policy environment.

Main Activities	Actions			For Whom? (Responsible Entity). How? (Application).	Key Performance Indicators (KPIs)
1. Developing national Blue Economy strategies:	**- Objective:** Formulating comprehensive national strategies for the Blue Economy and integrating youth participation as a priority.	**- Methodology:** Providing research expertise and data to support strategy formulation.	**- Outcome:** A favorable working environment for the development of the Blue Economy and activating the role of youth.	Governments (Relevant Ministries): Lead the process of formulating comprehensive national strategies for the Blue Economy that integrate youth participation objectives as a priority, in consultation with all actors. Youth Leaders: Active participation in strategy formulation committees. Academic and Scientific Institutions: Provide research expertise and data to support strategy formulation. Private Sector: Provide insights on sectoral opportunities and challenges. International and Regional Organizations: Provide best practices and international models.	

Main Activities	Actions			For Whom? (Responsible Entity). How? (Application).	Key Performance Indicators (KPIs)
2. Developing a supportive policy and legislative framework:	**- Objective:** Periodically measure the effectiveness of programs and initiatives, and identify strengths and weaknesses.	**- Methodology:** Data collection, analysis, and dissemination of periodic progress reports.	**- Outcome:** Regular performance reports and recommendations for program improvement.	Governments: Enact stimulating legislation and laws for youth entrepreneurship and simplify procedures. Parliaments and Legislative Bodies: Review and amend laws and regulations to be more supportive of youth projects in marine sectors, while considering environmental sustainability and access rights. Governments (Relevant Ministries): Propose necessary legislative amendments. Civil Society Organizations and Youth Leaders: Advocate for legislative amendments that serve youth interests. International and Regional Organizations: Provide legal advice and technical support. Youth Leaders: Participate in policy formulation that ensures a supportive environment.	• Number of legislative and policy amendments that support the blue economy and youth participation. • The extent to which the objectives set in the previous stages have been achieved. • Number of new regional and international agreements and partnerships. • The number of initiatives led by the Blue Economy Youth Council.
3. Establishing an impact monitoring and evaluation system:	**- Objective:** Periodically measure the effectiveness of programs and initiatives, and identify strengths and weaknesses.	**- Methodology:** Collect, analyze, and publish periodic reports on progress.	**- Outcome:** Regular performance reports and recommendations for software improvement.	Government Statistical Agencies: Develop reliable public data infrastructure and business registries. Ministries of Communications: Enhance knowledge and data exchange between countries and institutions to support innovation and project evaluation. Youth Leaders: Build a digital platform for data collection, analysis, and dissemination of periodic reports. Private Sector: Provide financial support.	
4. Allocating zones for youth:	**- Objective:** Providing tangible opportunities for the practical application of youth projects.	**- Methodology:** Site identification and financial and technical support.	**- Outcome:** Availability of suitable infrastructure.	Governments (Ministries of Planning, Fisheries, Environment): Identify specific marine or coastal areas that youth can utilize for their sustainable projects, with necessary support and basic infrastructure. Youth Leaders: Identify sites and submit proposals. Local Organizations: Assist in managing the areas.	
5. Enhancing regional and international cooperation:	**- Objective:** Exchanging best practices and experiences among countries in the region, and attracting technical and financial support from international organizations.	**- Means:** Signing Memoranda of Understanding, organizing regional meetings and workshops, participating in international forums.	**- Outcome:** Joint programs, cross-border projects, and increased international support.	Governments: Sign agreements and Memoranda of Understanding to exchange experiences and knowledge. International and Regional Organizations: Facilitate dialogue and cooperation among countries and actors. Academic and Scientific Institutions: Launch joint research programs and exchange students and researchers. Youth Leaders: Participate in regional and international forums and networks to exchange ideas. Private Sector: Explore cross-border partnership opportunities.	
6. Establishing a Regional Youth Blue Economy Council:	**- Objective:** Providing an official platform for youth to contribute to policy formulation, provide advice, and represent their interests.	**- Tasks:** Organizing regular meetings, submitting proposals, and participating in relevant government committees.	**- Outcome:** An influential youth voice in Blue Economy decisions.	Governments and Legislative Bodies: Involve youth in advisory committees and Blue Economy working groups. Youth Leaders: Represent youth voices and submit policy proposals. And active participation in strategy formulation committees. Civil Society Organizations: Facilitate youth participation in national and regional dialogues. International and Regional Organizations: Support mechanisms for youth participation in policy formulation.	
7. Providing tax incentives:	**- Objective:** Encouraging investment in this sector and reducing financial burdens on startups.	**- Tasks:** Exemptions, sustainability.	**- Outcome:** Increased volume of investment in startups.	Governments (Ministries of Finance): Provide tax incentives or exemptions for youth-led projects in the Blue Economy, especially those focusing on sustainability and innovation. Private Sector: Utilize these incentives to encourage investment in youth projects.	

Governance and Follow-up Framework

To ensure the effective implementation of this roadmap, this paper endorses **the establishment of a regional steering committee** comprised of representatives from governments, the private sector, youth, and academic and research institutions.

The **committee's mission** shall be tooversee implementation, review progress, and adapting the roadmap to emerging challenges and opportunities.

14 Conclusion

This study confirms that the Blue Economy represents a vital pillar for achieving sustainable development and prosperity in the region, particularly in Yemen, the Gulf States, and the Red Sea littoral states. The paper highlighted the immense potential of this sector, while also acknowledging the fundamental challenges that hinder its sustainable growth. Youth emerged as a pivotal driving force for innovation and transformation towards responsible environmental and economic practices. Through a comprehensive analysis of the literature, available opportunities, lessons learned from successful practices and case studies, and expert insights on the priorities, challenges, and opportunities that shape this vital sector in their unique regional contexts, this paper presented an integrated framework, practical pathways, and a roadmap to enhance youth entrepreneurship. Realizing the full potential of the Blue Economy requires strategic investment in developing youth capabilities, providing innovative financing mechanisms, and establishing stimulating policy frameworks, within an environment of effective regional cooperation. Thus, the region can unleash the energies of its youth and its marine wealth to ensure a more resilient, prosperous, and sustainable future for generations to come.

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16 Appendices

16.1 Appendix (1) Interview Guide for Experts in the Blue Economy and Youth Entrepreneurship

His Excellency / Respected [Expert's Name - if known, otherwise omit]

Greetings,

I am honored to extend my sincere thanks for dedicating a part of your valuable time to participate in this research interview. My name is Prof. Dr. Khaled Abduljalil Mohammed Al-Najjar, Professor of Economic Geography at Taiz University, and I am currently preparing a scientific study titled "Entrepreneurship and Youth Participation in the Blue Economy in Yemen, the Gulf, and the Red Sea Littoral States." This study aims to analyze the strategic potential of the Blue Economy as a lever for sustainable development, with a particular focus on exploring the challenges and opportunities associated with youth entrepreneurship within this vital sector in (Yemen, the Gulf States, and the Red Sea Littoral States). Your distinguished scientific and practical experience in the field is an essential element for enriching this study and achieving its research objectives. This interview follows a semi-structured model, allowing flexibility in discussion while ensuring coverage of the study's core themes. I would like to assure you that all personal data, information, and opinions you provide will be treated with utmost confidentiality and will be used exclusively for scientific research purposes. Would you kindly agree to conduct this interview? Do you have any questions before we begin the discussion?

Part One: Preliminary Participant Data (Optional)

1. Please state your current or previous job title that connects you to the field of study (Blue Economy, Sustainable Development, Entrepreneurship).

2. What is your specialized practical experience in this field?

Part Two: Conceptual Framework of the Blue Economy

1. How do you define the concept of the Blue Economy from your specialized perspective? What are the main components of this economy that you consider most vital in the regional context?

2. What is your assessment of the importance of the Blue Economy in supporting the sustainable development agenda and youth participation at regional and international levels? How does this concept differ from traditional maritime economic approaches?

3. What is your assessment of the level of awareness and knowledge of the Blue Economy concept and its transformative potential among stakeholders, policymakers, and local communities in the region? What are the most prominent gaps or strengths in this awareness from your point of view?

Part Three: Assessing the Reality of Youth Entrepreneurship in the Blue Economy

1. How do you evaluate the current state of youth contribution to entrepreneurship within the Blue Economy sectors in your region (the expert's country)?

2. Can you point to examples of current initiatives or programs aimed at supporting youth entrepreneurship in this sector? What is your assessment of their effectiveness and impact?

3. In the context of the evolving role of youth from mere participation to strategic leadership in the Blue Economy, do you see this transformation actually happening in the region? What are the indicators or evidence that support your view?

Part Four: Analysis of Opportunities and Challenges

1. Opportunities: What are the most prominent promising investment and entrepreneurial opportunities for youth within the Blue Economy sectors in the region? (Specific sectors can be mentioned, such as: sustainable aquaculture, marine ecotourism, marine renewable energy, advanced marine technology).

2. Environmental Challenges: What are the pivotal environmental challenges (e.g., climate change, marine pollution, overexploitation of marine resources) that face the region? How do these challenges pose obstacles to the development of youth entrepreneurship in the Blue Economy?

3. Economic and Financial Challenges: What are the most prominent economic and financial obstacles faced by young entrepreneurs in this sector? (For example: the SME funding gap, challenges in accessing capital, or perceived investment risks). What are the proposed mechanisms to overcome them?

4. Regulatory Challenges and Skills Development: To what extent do current regulatory frameworks, legislative uncertainty, and a lack of specialized qualitative skills affect the effectiveness of youth participation in the Blue Economy?

Part Five: Review of Best Practices and Lessons Learned

1. Can you provide examples of initiatives or best practices (at the international, regional, or local level) that have proven successful in empowering youth entrepreneurship within the Blue Economy?

2. What are the key strategic lessons that can be drawn from these successful experiences, and which can be applicable or adaptable in the context of the Arab region?

3. From your perspective, what are the essential components of the supportive ecosystem (such as policies, funding mechanisms, capacity building programs, strategic partnerships) that should be prioritized to promote youth entrepreneurship in this sector?

Part Six: Strategic Recommendations and Proposals

1. What strategic recommendations do you offer to relevant stakeholders (policymakers, governments, institutions) to foster a nurturing and stimulating environment for youth entrepreneurship in the Blue Economy, including the role of multilateral cooperation?

2. What innovative financing mechanisms do you believe are most effective in bridging the funding gaps that hinder youth entrepreneurial projects in this sector?

3. How can the qualitative capabilities and skills of youth be developed and enhanced to meet the changing demands of the labor market in the Blue Economy? What is the pivotal role of education and training in this regard?

4. What joint regional initiatives or partnerships are necessary to achieve maximum impact in developing the Blue Economy and empowering youth on a large scale?

5. What motivational or guiding message would you like to convey to youth to encourage them to actively engage in leading the Blue Economy?

6. Are there any additional points you would like to highlight or questions you would like to ask before concluding the interview?

In closing, thank you very much for your time and valuable knowledge contributions.

16.2 Appendix 2: Definitions and Components of the Blue Economy from the Perspective of Major International Organizations

Organization/Source	Definition/main focus	Key Components/Sectors Emphasized
World Wide Fund for Nature (WWF)	A marine economy that provides social and economic benefits for current and future generations, restores, protects, and maintains the diversity, productivity, and resilience of marine ecosystems, and relies on clean technologies, renewable energy, and circular material flows.	Social and economic benefits, restoration and protection of ecosystems, clean technologies, renewable energy, circular economy.
World Bank	The sustainable use of ocean resources for economic growth, improved livelihoods and jobs, while preserving the health of ocean ecosystems.	Economic growth, improved livelihoods and jobs, ocean ecosystem health.
United Nations Conference on Trade and Development (UNCTAD)	The Blue Economy refers to improving human well-being and social equity while significantly reducing environmental risks and ecological scarcity. The concept of the Blue Economy also embodies the economy, trade, and activities that integrate conservation, sustainable use, and management of biodiversity.	Includes marine ecosystems and environmental resources.
European Commission	All economic activities related to oceans, seas, and coasts, covering a wide range of interconnected established and emerging sectors.	Fisheries, aquaculture, coastal tourism, maritime transport, port activities, shipbuilding, oil and gas extraction, blue energy, blue biotechnology, seabed mining.
United Nations Environment Programme (UNEP)	A set of economic sectors and related policies that determine whether the use of ocean resources is sustainable.	Sustainable use of ocean resources, ecosystem health, pollution prevention, cross-border and cross-sectoral cooperation.
Indian Ocean Rim Association (IORA)	The integration of ocean economy development that enhances human well-being in an inclusive manner.	The concept of ocean economy development includes the practice of social inclusion, environmental sustainability, and an innovative business model.
Pacific Small Island Developing States (PACIFIC SIDS)	The Blue Economy refers to the sustainable management of ocean resources to support livelihoods, more equitable sharing of benefits, and the resilience of ecosystems in the face of climate change and destructive fishing practices.	Sustainable management, ecosystem resilience.
Regional Activity Centre for SCP/RAC (UNEP/MAP)	A low-pollution circular economic system based on sustainable consumption and production patterns that can increase well-being and social equity, and generate economic value and employment.	Significantly reduces environmental risks and the scarcity of natural resources.
Food and Agriculture Organization (FAO)	An economy centered on marine activities in water bodies such as oceans, seas, lakes, and gulfs, and the investment of their resources to achieve the best possible return from these economic activities, such as fishing, maritime transport, mining, logistics tourism, and services.	Fishing, maritime transport, mining, logistics tourism, and services.
Sustainable Blue Economy Initiative launched by the Union for the Mediterranean	The Blue Economy serves as a neighborhood policy and a commitment to preserving fish stocks.	It also seeks to achieve three main objectives: a more secure marine area, a smart and resilient blue economy, and optimal governance of the sea and its resources.

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