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BEYOND THE SHORELINE

Towards a Blue and Resilient Future for Tunisia

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This synthesis report is a key deliverable of the World Bank's technical assistance to support Tunisia in defining a roadmap to unlock and develop its blue economy potential.

Several deep dive analyses were conducted to inform the Tunisia blue economy roadmap, including a policy and institutional gap analysis, a Blue Public Expenditure Review, and an analysis of innovative financing and private sector investments in blue sectors. An integrated database for the blue economy was also designed. Various sources, including academic research and government reports, have been consulted and interviews have been conducted with various stakeholders, including government agencies, academia, and non-governmental organizations (NGOs). Between February and September 2023, stakeholder consultation workshops and meetings were also run to gather views and information. A national stakeholders' workshop was organized on November 9, 2023, to present the findings of the deep dive analyses.

This report synthesizes the key findings from these analyses and activities and aims to provide strategic guidance to support the Government of Tunisia's key national environmental and economic sectors in moving towards a blue economy agenda that is aligned with the country's national ecological transition strategy, which was adopted by the Tunisian government in February 2023.

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Acronyms and Abbreviations

ANPE	*Agence Nationale de Protection de l'Environnement* (National Environmental Protection Agency)
APAL	*Agence de Protection et d'Aménagement du Littoral* (Agency for Coastal Protection and Development)
APIP	*Agence des Ports et des Installations de Pêche* (Agency for Ports and Fishing Facilities)
CGDSR	*Comité Général du Développement Sectoriel et Régional* (General Committee for Sectoral and Regional Development)
CMAM	*Commission Ministérielle des Affaires Maritimes* (Ministerial Commission for Maritime Affairs)
ESG	Environmental, social, and governance
GHG	Greenhouse gas
GIS	Geographic information system
ICZM	Integrated coastal zone management
INSTM	*Institut National des Sciences et Technologies de la Mer* (National Institute of Marine Sciences and Technologies)
ITCEQ	*Institut Tunisien de la Compétitivité et des Études Quantitatives* (Tunisian Institute for Competitiveness and Quantitative Studies)
km	Kilometers
LISP	*Littoral Sans Plastique* (Plastic-Free Coastline)
ME	*Ministère de l'Environnement* (Ministry of Environment)
MEP	*Ministère de l'Economie et de la Planification* (Ministry of Economy and Planning)
MPA	Marine protected area
NGO	Non-governmental organization
NPL	Non-performing loans
OMMP	*Office de la Marine Marchande et des Ports* (Merchant Marine and Ports Office)
ONTT	*Office National du Tourisme Tunisien* (Tunisian National Tourism Office)
OTEDD	*Observatoire Tunisien de l'Environnement et du Développement Durable* (Tunisian Observatory for the Environment and Sustainable Development)
PER	Public Expenditure Review
PMU	Program Management Unit
SDG	Sustainable Development Goal
SGAM	*Secrétariat Général des Affaires Maritimes* (General Secretariat of Maritime Affairs)
SME	Small and medium-sized enterprise
SSP	Shared Socioeconomic Pathways
ZAA	*Zones Attribuées à l'Aquaculture* (Allocated Zones for Aquaculture)

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Executive Summary

The Tunisian economy's challenging past decade has highlighted the pressing need for a sustainable and resilient development model. The nation's strategic response, encapsulated in Vision Tunisia 2035 and the 2023–2025 National Development Plan, emphasizes a green and **blue economy** that focuses on sectors such as **tourism, fisheries, aquaculture, and maritime transport** as key drivers for recovery and long-term sustainability.

Environmental threats such as resource overexploitation, coastal erosion, marine submersion, and pollution—in particular plastic pollution—pose significant risks to these critical economic sectors, especially when exacerbated by climate change. To address these challenges, proactive investments in sustainable practices within key sectors can enhance Tunisia's global market competitiveness, reduce fiscal pressures, and foster innovative growth and job opportunities.

While stakeholders recognize the blue economy's importance, it's full implementation could be enhanced by appropriate regulatory frameworks and clarification of responsibilities. Stakeholder consultations underline the need for robust governance with an emphasis on regular updates, capacity-building, and effective communication. Strategic actions and clear financing instruments are essential for aligning national efforts with blue economy objectives. The World Bank has been critical in supporting Tunisia's effort to chart the path towards harnessing the potential of the blue economy. Starting with a comprehensive diagnostic in 2021–2022, the collaboration has led to the development of a strategic roadmap focusing on policy and institutional analysis, public expenditure review, exploration of innovative financing, and critical sectoral analyses to unlock the potential of the key sectors while protecting the environment. Extensive stakeholder consultations have shaped the roadmap, which emphasizes sustainable growth, environmental conservation, and resilient coastal communities. The roadmap addresses key sectors through the **three pillars** of the blue economy development framework: (i) data, analysis, and dissemination; (ii) policy, institutional, and fiscal reforms; and (iii) fostering investment.

Under the **first pillar** of the roadmap for Tunisia's blue economy, several analyses have contributed to the development of an integrated, multisectoral information system to facilitate decision-making and sustainable resource management. Key activities include creating and federating a comprehensive and reliable database on marine and coastal information, preparing an initial prototype of the Blue Economy Geoportal, and using geospatial data and technologies to monitor and evaluate the natural carbon sequestration deposits in marine and coastal ecosystems.

As part of the roadmap's **second pillar**, deep analytical work first focused on institutional reforms to address the need for a strong coordination function as underlined in the blue economy diagnostic. This involved analyzing the country's policy framework and sectoral policies, conducting comparative international case studies, and engaging stakeholders to align visions and overcome governance challenges. The discussion on the second pillar includes recommendations and proposed priority activities to establish an interinstitutional coordination mechanism, assess and modernize regulatory frameworks, and enhance governance structures. The coordination mechanism could include an inter-ministerial steering committee, a general coordination structure, and an execution structure. Additionally, a review of blue public expenditure was conducted to determine how public funds are being allocated and identifying opportunities to stimulate the blue economy through strategic investments and fiscal reforms.

The **third pillar** of the roadmap identifies priority activities that could promote blue economy investments in key sectors of the economy and enhance environmental protection and restoration, as well as climate resilience and adaptation.

These activities can be summarized by sector as follows:

For coastal tourism, the roadmap identifies challenges such as coastal erosion and pollution, and advocates transitioning to sustainable practices. Key activities include developing guidelines for sustainable coastal tourism, deploying pilot projects for ecological transition, creating ecotourism offers, training stakeholders, and promoting "Sustainable Tourism Champions".

For the fisheries and aquaculture sectors, the focus is on addressing gaps such as the inadequacy of stock assessments and the need to improve data collection. Proposed activities include developing participatory information collection protocols, mapping and assessing fish stocks, updating management plans for major species and areas, promoting inclusive resource management, implementing integrated fisheries monitoring, designing and managing *Zones Attribuées à l'Aquaculture* (ZAA, allocated zones for aquaculture), updating the Aquaculture Master Plan, and modernizing outdated aquaculture infrastructures.

For maritime transport, the roadmap emphasizes modernizing infrastructure and improving international competitiveness. Activities include renewing the maritime fleet to meet environmental standards, updating regulatory frameworks for port concessions, establishing refueling and treatment infrastructures, and strengthening safety and environmental controls.

Necessary efforts in **environmental protection and climate change mitigation and adaptation** have also been highlighted. Activities include implementing management plans for marine protected areas (MPAs), mapping ecologically sensitive zones, establishing a sustainable implementation mechanism for the *Littoral Sans Plastique* (LISP, Plastic-Free Coastline)[1] strategy, and executing the LISP Action Plan. Other measures include establishing coastal and marine ecological restoration and climate adaptation projects in identified vulnerable coastal and marine areas, leveraging integrated coastal zone management (ICZM) approaches, community participation, and nature-based solutions.

The Government of Tunisia has taken proactive steps to unlock the potential of the blue economy that includes adding blue economy financing to the 2023 national budget. However, direct allocations and specific actions are still limited. A balanced approach in public and private sector collaboration that includes innovative financing models is necessary. Using this comprehensive and pragmatic blue economy roadmap, Tunisia could adopt a multifaceted investment strategy that includes public fund reallocation, international financing, public-private partnerships, and novel instruments such as blue bonds. Fiscal incentives and corporate social responsibility practices also play a potentially significant role in attracting investments and promoting a sustainable blue economy.

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Résumé Exécutif

Les défis que l'économie Tunisienne a rencontrés au cours de la dernière décennie ont révélé le besoin urgent de disposer d'un modèle de développement durable et résilient. La réponse stratégique du pays, articulée dans la « Vision Tunisie 2035 » et le « Plan National de Développement 2023–2025 », met l'accent sur une **économie verte et bleue**, se concentrant sur des secteurs tels que **le tourisme, la pêche, l'aquaculture et le transport maritime** comme moteurs clés de la reprise et d'un développement durable à le long terme.

Les menaces environnementales, exacerbées par le changement climatique, telles que la surexploitation des ressources, l'érosion côtière, la submersion marine ainsi que la pollution en particulier par le plastique, représentent des risques importants pour ces secteurs économiques essentiels.

Pour relever ces défis, des investissements proactifs dans des pratiques durables au sein de secteurs clés peuvent améliorer la compétitivité de la Tunisie sur le marché mondial, réduire les pressions budgétaires et favoriser une croissance innovante et des opportunités d'emploi. Tout en reconnaissant l'importance de l'économie bleue, son opérationnalisation peut être favorisée par des cadres réglementaires appropriés et une clarification des responsabilités. Les consultations avec les parties prenantes soulignent la nécessité d'une gouvernance solide, en mettant l'accent sur des mises à jour régulières, le renforcement des capacités et une communication efficace. Des actions stratégiques et des instruments de financement clairs sont essentiels pour aligner les efforts nationaux sur les objectifs de l'économie bleue. La Banque mondiale a joué un rôle essentiel en soutenant les efforts de la Tunisie pour tracer la voie vers l'exploitation du potentiel de l'économie bleue. Commençant par un diagnostic approfondi en 2021–2022, la collaboration a abouti à l'élaboration d'une feuille de route stratégique s'appuyant sur une analyse des capacités institutionnelles et des politiques, l'examen des dépenses publiques, l'exploration de financements innovants et des analyses sectorielles essentielles pour libérer le potentiel des secteurs clés tout en protégeant l'environnement. De vastes consultations des parties prenantes ont façonné la feuille de route, qui met l'accent sur la croissance durable, la conservation de l'environnement et la résilience des communautés côtières. La feuille de route aborde des secteurs clés à travers les trois piliers du cadre de développement de l'économie bleue : (i) Données, Analyse et Dissémination ; (ii) Réformes Stratégiques, Institutionnelles et Budgétaires ; et (iii) Promotion des Investissements.

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Au titre du **premier pilier** de la feuille de route pour l'économie bleue de la Tunisie, les analyses ont permis de prioriser le développement d'un système d'information intégré et multisectoriel pour faciliter la prise de décision et la gestion durable des ressources. Les activités clés comprennent créer et fédérer une base de données complète et fiable sur les informations marines et côtières, préparer un premier prototype de géoportail de l'économie bleue et utiliser les données et technologies géospatiales pour surveiller et évaluer les dépôts naturels de séquestration de carbone dans les écosystèmes marins et côtiers (Carbone Bleu).

Concernant le **deuxième pilier** de la feuille de route, un travail d'analyse approfondi s'est d'abord concentré sur les réformes institutionnelles pour répondre à la nécessité de mettre en place une fonction de coordination forte comme souligné dans le diagnostic de l'économie bleue. Il a reposé sur l'analyse du cadre réglementaire et des politiques sectorielles, la réalisation d'analyses comparatives d'études de cas internationales et l'engagement des parties prenantes pour aligner les visions et surmonter les défis de gouvernance. La discussion autour du deuxième pilier a permis de formuler des recommandations et proposer des activités prioritaires afin d'établir un mécanisme de coordination interinstitutionnelle, évaluer et moderniser les cadres réglementaires et améliorer les structures de gouvernance. Le mécanisme de coordination comprend un Comité de Pilotage Interministériel, une structure de coordination générale et une structure d'exécution. De plus, un « Examen des Dépenses Publiques Bleues » a été mené, se concentrant sur l'allocation des fonds publics et l'identification des opportunités pour stimuler l'économie bleue par des investissements stratégiques et des réformes fiscales.

Enfin, dans le cadre du **troisième pilier** de la feuille de route, des activités prioritaires ont été identifiées visant à promouvoir les investissements dans l'économie bleue dans des secteurs clés de l'économie ainsi que pour la protection et à la restauration de l'environnement, la résilience et l'adaptation au climat. Ces activités peuvent être résumées par secteur comme suit :

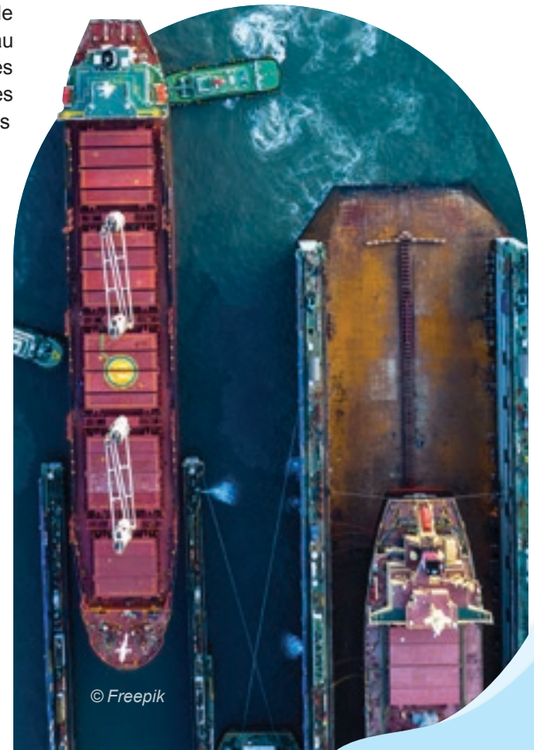
Concernant le tourisme côtier, la feuille de route identifie des défis tels que l'érosion côtière et la pollution, et préconise une transition vers des pratiques durables. Les activités clés comprennent l'élaboration de lignes directrices pour un tourisme côtier durable, le déploiement de projets pilotes pour la transition écologique, la création d'offres d'écotourisme, la formation des acteurs et la promotion de champions du tourisme durable.

Concernant les secteurs de la pêche et de l'aquaculture, l'accent est mis sur la résolution des lacunes telles que l'insuffisance des évaluations des stocks et la nécessité d'améliorer la collecte de données. Les activités proposées comprennent l'élaboration de protocoles participatifs de collecte d'informations, la cartographie et l'évaluation des stocks de poissons, la mise à jour des plans de gestion pour les principales espèces et zones, la promotion d'une gestion inclusive des ressources, la mise en œuvre et le suivi intégré de la pêche, la conception et la gestion des Zones Attribuées à l'Aquaculture (ZAA), la mise à jour du plan directeur de l'aquaculture et la modernisation des infrastructures aquacoles vétustes.

Concernant le transport maritime, la feuille de route met l'accent sur la modernisation des infrastructures et l'amélioration de la compétitivité internationale. Les activités comprennent le renouvellement de la flotte maritime pour répondre aux normes environnementales, la mise à jour des cadres réglementaires pour les concessions portuaires, la création d'infrastructures de ravitaillement et de traitement et le renforcement des contrôles de sécurité et environnementaux.

De plus, les efforts nécessaires en matière de **protection de l'environnement et d'atténuation et d'adaptation au changement climatique** ont été mis en exergue. Les activités comprennent la mise en œuvre de plans de gestion pour les Aires Marines Protégées, la cartographie des zones écologiquement sensibles, l'établissement d'un mécanisme durable de mise en oeuvre de la stratégie Littoral Sans Plastique (LISP) et l'exécution de son plan d'action pour la réduction de la pollution plastique ainsi que la mise en place de projets de restauration écologique côtière et marine et d'adaptation au changement climatique dans les zones côtières et marines vulnérables identifiées, en tirant parti de l'approche de Gestion Intégrée des Zones Côtières (GIZC), de la participation communautaire et des solutions basées sur la nature.

Enfin, pour libérer le potentiel de l'économie bleue, le gouvernement tunisien a pris des mesures proactives et a inclus le financement de l'économie bleue dans le budget national 2023. Cependant, il reste confronté à des défis en raison d'allocations budgétaires directes limitées dans les secteurs clés de l'économie bleue et du manque d'actions spécifiques. Une approche équilibrée de collaboration entre les secteurs public et privé, incluant des modèles de financement innovants, est nécessaire. Grâce à sa feuille de route détaillée et pragmatique pour le développement de l'économie bleue, la Tunisie peut adopter une stratégie d'investissement à multiples facettes, comprenant la réaffectation des fonds publics, le financement international, les partenariats public-privé ainsi que de nouveaux instruments. Les incitations fiscales et les pratiques de responsabilité sociale des entreprises peuvent jouer un rôle important pour attirer les investissements et promouvoir une économie bleue durable.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Introduction

Tunisia is strategically located at the heart of the Mediterranean's southern shore. With more than 1,300 kilometers (km) of coastline and 64 islands and islets, it is a country with a strong maritime identity. This connection to the sea is evident in the importance of the tourism industry, fishing and aquaculture sectors, and maritime transport for its economy. The coastal region is home to 85 percent of the population (7.6 million people) who rely on marine and coastal resources for their livelihoods. Most urban agglomerations and nearly all industrial activities are concentrated along the coast.

Tunisia's economy has faced numerous challenges, including the severe impact of the COVID-19 pandemic, which led to a sharp decline in GDP in 2020. After a recovery in 2022, economic growth showed a more moderate pace in 2023, hindered by persistent droughts, regulatory challenges, and mounting public service enterprise debts. The country's financial situation has been challenging, with high public debt and a significant annual budget deficit. Unemployment rates, particularly among women and youth, remain elevated, indicating a need for sustainable, resilient economic models.

Given this context, the blue economy emerges as a crucial element of Tunisia's economic strategy. Vision Tunisia 2035 and the 2023–2025 National Development Plan underscore the importance of sustainable resource use, climate change adaptation, and the development of a blue economy. These strategic frameworks prioritize environmental conservation and sustainable industry practices and aim to rebuild key sectors like tourism, fisheries, aquaculture, and maritime transport.

This synthesis report presents a structured overview of the challenges and opportunities within Tunisia's blue economy. Chapter 1 examines the economic, social, and environmental challenges impacting the development of blue sectors as well as strategic blue economy policy, institutional, and governance barriers. Chapter 2 follows with a detailed account of the World Bank's support in unlocking Tunisia's blue economy potential. Chapter 3 presents the proposed Tunisian blue economy roadmap with key priority action areas and related priority activities across the three pillars of the blue economy development framework:[2] (i) data, analysis, and dissemination; (ii) policy, institutional and fiscal reforms; and (iii) fostering investment. The report concludes with a focus on financing the blue economy in Chapter 4.

"Vision Tunisia 2035 and the 2023–2025 National Development Plan underscore the importance of

SUSTAINABLE RESOURCE USE, CLIMATE CHANGE ADAPTATION, AND THE DEVELOPMENT OF A BLUE ECONOMY.

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Challenges and Opportunities for Blue Growth in Tunisia

Economic and social challenges impacting blue economy development Tunisia's economy has been grappling with a challenging decade and a host of systemic issues. The country was hit hard by the COVID-19 pandemic, which caused a drop in GDP in 2020 (-9.2 percent). Commodity price increases linked to the Russia-Ukraine war further exacerbated the country's financial challenges. While Tunisia's real GDP witnessed a growth of 2.4 percent[3] in 2022. As a first estimate for the whole year 2023, the national economy recorded 0.4% growth rate. Excluding agriculture, the annual Real GDP increased by 1.6%[4], mainly attributed to persistent droughts, regulatory hurdles, and the increasing debt of key public service enterprises.[5]

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Inflation surged, the budget deficit persisted, and the current account deficit expanded due to rising import prices. The annual current account deficit has been above 4.6 percent since 2010, peaking at 10.8 percent in 2018.[6] This deficit position has improved, as it showed a notable decrease from 4.1 percent of GDP in the first half of 2022 to 1.5 percent in the corresponding period of 2023, aided by reductions in the trade deficit.[7] Inflation has been above 5 percent since 2017, reaching 9 percent in 2023.[8] The annual budget deficit was, on average, 4.7 percent between 2010 and 2021 (excluding 2020), leading to public debt increasing from 66.9 percent of GDP in 2017 to 79.4 percent of GDP in 2022.[9]

The unemployment rate[10] stood at 16.4 percent at the end of 2023[11] and disproportionately affects certain segments of the population, mostly women and youth. As much as 22.2 percent of women are unemployed and 40.9 percent of people between the ages of 15 and 24 are jobless. In 2023, the national poverty rate was 15.3 percent.[12]

Amid such a challenging environment, Tunisia needs a new, sustainable, and resilient development model to ensure short-term recovery and long-term prosperity. The blue economy, an integral segment of the nation's economic fabric, offers a promising avenue in this direction. A plan to rebuild key blue economy sectors such as coastal tourism, fisheries and aquaculture, and maritime transport could drive the recovery process and unlock opportunities towards the long-term transformation of these sectors while making them more resilient and sustainable, ultimately supporting economic growth and creating jobs to drive the expected ecological transition.[13]

Tunisia has already initiated a holistic and integrated reform process,[14] starting with Vision Tunisia 2035 and the 2023–2025 National Development Plan.

Vision Tunisia 2035[15] outlines the principles of sustainable development for Tunisia. It identifies green economy and climate change as its fourth pillar, which prioritizes the "sustainable use of resources and adaptation to climate change to guarantee the right of next generations", the need for a "change in production and consumption models" with a focus on "developing the blue economy",[16] and "taking care of the ocean".[17] Vision Tunisia 2035 also aims to preserve water resources and increase the country's resilience to climate change.[18]

Tunisia's 2023–2025 National Development Plan[19] aims to ensure the short-term implementation of the guiding principles of the Vision and includes a series of "major strategic axes for the new development model" that incorporate a blue economy dimension.

In the strategic axis on "a competitive and diversified economy supporting entrepreneurship", Tunisia expresses the objective of supporting Sustainable Development Goal (SDG) 14 (life below water) and SDG 13 (climate action) through new sector strategies that increase the sustainability and competitiveness of key sectors such as industry, agriculture, and tourism, in addition to promoting public-private partnerships. This axis aims to improve the efficiency of Tunisia's production system, increase the position of its industries in global value chains, and promote exports and investment. The development of this strategic axis is budgeted at 10.7 billion Tunisian dinars (TD) (US$3.5 billion, calculated at an exchange rate of TD 3.09 per US$1 throughout the report).[20]

In the strategic axis on the green economy and climate change, Tunisia expresses its aims to support SDG 12 (responsible consumption and production), SDG 13 (climate action), SDG 14 (life below water), and SDG 15 (life on land), giving priority to climate change adaptation. The development of this strategic axis is budgeted at TD 6.7 billion (US$2.2 billion).

The 2023–2025 National Development Plan includes recommendations on the role of public investment as "the main engine for development, the incentive to private investment, and the main leverage to improve the attractiveness of Tunisia for foreign investors".[21] It further recommends that public investment should be directed towards projects that target "economic, social, and environmental" outcomes.

Tunisia's Finance Law for 2024 considers these recommendations and emphasizes the blue and green economy, as well as adaptation to climate change. The Finance Law 2024 represents a strategic shift and aligns Tunisia's financial policies with sustainable practices. For example, it places significant emphasis on bolstering the agricultural sector, fisheries, and water resources. The law also includes fiscal incentives to promote the use of renewable energy and to support green, blue, and circular economic projects. The Finance Law 2024 further promotes carbon taxation and enhances the competitiveness of the maritime transport sector and the Tunisian Navigation Company by granting it tax benefits for local procurement and services.

Harnessing the potential of the blue economy is a critical step towards accelerating Tunisia's sustainable development model, ensuring that the country not only addresses its immediate economic concerns but also paves the way for future growth and stability.

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Environmental threats undermining the development of the blue sectors

Tunisia recognizes the interplay of economic, social, and environmental dimensions in Vision Tunisia 2035. It places the blue economy as an invaluable asset pivotal to achieving the vision's goals. Historically and geographically, the nation's coastline has been instrumental in shaping its economic trajectory—the blue economy contributed nearly 14 percent to Tunisia's GDP in 2018.[22] In Tunisia, investing in the development of the blue economy is both a matter of protecting existing economic activities from the threat of environmental degradation and of exploring new avenue for future long-term prosperity.

The coastal and marine ecosystems of Tunisia—the health of which is vital to its blue economy—are currently grappling with numerous threats. Many of these threats are anthropogenic, including unsustainable extraction of marine resources, unchecked coastal development, and pollution. These human-induced factors have, in tandem with climate change, exacerbated challenges such as coastal erosion, eutrophication, and soil salinization, threatening the current and future prospects of some of the pillars of the Tunisian economy.

Tunisia faces significant climate-induced risks.[23] A substantial portion of its land, including 24 percent of its populous coastal areas, is vulnerable to shoreline erosion, sea-level rise, and flooding. The impact of climate change, particularly under the representative concentration pathway (RCP) 8.5 scenario and Shared Socioeconomic Pathways (SSPs) 2 and 3, is expected to increase the variability of precipitation and escalate the likelihood of catastrophic floods. By 2050, about 0.4 percent of Tunisia's total land area could be affected by sea-level rise, leading to potential land losses valued at up to US$1.6 billion.

This scenario presents a critical threat to various sectors, especially coastal tourism. Without adaptation measures, the direct and indirect effects of coastal surface area loss could cost Tunisia's economy up to 6.9 percent of its 2020 GDP by 2050. A significant portion of Tunisia's beaches, integral to its tourism, are already showing alarming signs of degradation. Of the 570 km of tourist beaches, 190 km have deteriorated noticeably[24] and are at risk of vanishing entirely. This loss primarily affects the hotel, restaurant, and catering sector, along with public revenue, tourism-related economic activities, and employment. A strong ICZM approach could mitigate these impacts, significantly reducing the potential economic losses.

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Agriculture[25]—another cornerstone of Tunisia's economy that accounts for close to 10 percent of GDP[26] and 16 percent of employment—is also threatened. Coastal agricultural resources—including 43,000 hectares of agricultural land identified by the *Agence de Protection et d'Aménagement du Littoral* (APAL, Agency for Coastal Protection and Development)—face the threat of submersion due to rising sea levels. These agricultural lands support diverse agricultural practices, from arboriculture to grazing lands. Furthermore, coastal water resources, fundamental for both agriculture and human consumption, are under stress. Half the water potential of groundwater is found in coastal aquifers and constitutes approximately 7 percent of available water in the country.[27] These coastal water resources are already experiencing significant losses,[28] with estimates suggesting a 221 million cubic meter (m^3) reduction in total coastal groundwater resources, from about 291 million m^3, according to a study by APAL in 2012.[29] Protecting water resources is one of the key objectives of Vision Tunisia 2035's fifth pillar (green economy).

The fisheries and aquaculture sector[30] represents 8 percent of agricultural output and provides employment for about 100,000 people (about 54,000 people directly and 45,000 indirectly).[31] While still comparatively small, aquaculture has grown in Tunisia, with production increasing from 3,400 tons in 2007 to 17,000 tons in 2017, which represents about 16 percent of the national fish production. If developed sustainably, aquaculture represents an exciting contribution to the blue economy. A total of 41 aquaculture sites have already been developed, generating about 2,000 direct and indirect jobs. Aquaculture production is expected to reach 30,000 tons in 2030.[32] Tunisia's Long-Term Carbon Neutral and Climate Resilient Development Strategy by 2050[33] notes that, in the context of climate change, the fisheries and aquaculture sector faces significant challenges due to anticipated transformation within marine ecosystems. Rising temperatures, increased salinity, and acidification are expected to intensify existing pressures on these sectors, accelerating the depletion of fishery resources and potentially leading to decreases in the export volume of fishery products.

Pollution, both physical and chemical, is another pressing concern.[34] Several coastal sites have been transformed into open-air landfills, leading to deterioration in water quality. Landfill pollution is particularly acute near economically active zones, notably the vulnerable coastal wetlands, which span about 200,000 hectares. These wetlands, mainly concentrated in the Gulf of Gabès region,[35] encompass lagoons, 155,000 ha of salt marshes, and 5,100 ha of maritime oases.

Plastic pollution,[36] which already threatens Tunisia's coastlines, is further exacerbated by tourism and fishing activities, with some estimates suggesting that between 60 percent and 70 percent of all beach waste is plastic. As fishing activities intensify, the generation of plastic waste will increase, given the sector's reliance on plastic tools such as nets and plastic traps. Inefficient waste management practices, coupled with factors such as adverse weather conditions and unregulated fishing that uses extensive nets, further aggravate the situation. According to the WWF,[37] fishing and aquaculture in Tunisia produce about 1.3 kilotons of plastic debris—including plastic traps, mussel nets, shipping containers, and more—each year. Specifically, aquaculture in Tunisia is estimated to produce 275 tons of plastic waste each year, based on an annual production figure of 25,080 tons for 2020.[38]

International trade dynamics add another layer of complexity to Tunisia's situation. Key markets, such as the European Union, are rolling out stringent environmental and climate policies. These policies, combined with a global shift in consumer preferences towards sustainability, have concerning implications for Tunisia's export prospects if sectors such as tourism or fisheries do not adopt sustainable practices.

Given these challenges, Tunisia's approach to the blue economy needs to be based on practices that balance economic and environmental imperatives, including ICZM. The tourism sector, given its deep ties with the coastal ecosystem, could be at the forefront of this transformative journey. Conscious of such imperatives, Tunisia has already integrated blue economy considerations in a multitude of national and sectoral strategies.

Macroeconomic impacts and opportunities of the blue economy

A growing body of evidence shows that climate change and environmental degradation can have a significant impact on macroeconomic stability, both in the short and long term. While such evidence is scarce for Tunisia, an analysis of key blue economy sectors shows vulnerabilities that, if not addressed, could jeopardize the achievement of Vision Tunisia 2035 in the long term and the 2023–2025 National Development Plan in the short term.[39] Addressing these vulnerabilities by developing new industries and business models could provide new avenues for sustainable growth and prosperity.

One of the key issues the Tunisian economy has faced over the past decade is its current account deficit. The annual current account deficit has been above 4.6 percent since 2010, peaking at 10.8 percent in 2018.[40]

The Tunisian economy is sensitive to adverse shocks in the tourism sector with potential significant impacts on employment, foreign exchange earnings, and the profitability of large segments of the economy related to the tourism industry. Tourism receipts grew by 28.1 percent in 2023, reaching TD 6.9 billion, or 4.4 percent of GDP up from 3.8 percent of GDP in 2022.[41] The sector accounted for 10.2 percent of the jobs in Tunisia, or 345,000 direct and indirect jobs.[42] In 2019, international tourism generated TD 5.6 billion (US$1.8 million) in revenue, or 6.3 percent of total exports, and placed as the country's second-largest export sector behind textiles and clothing. Tourism plays an important role in terms of share of foreign exchange reserves as it contributed 44 percent of total foreign exchange reserves in 2019.

As mentioned previously, the tourism sector is already threatened by sea level rise, with 190 km of the 570 km beaches used for tourism noticeably deteriorating.[43] Given the sector's contribution to Tunisia's GDP, the potential short-term economic fallout is enormous in terms of foreign exchange reserves.

In 2022, Tunisia adopted a long-term strategy for the tourism sector, called the Tunisia Tourism 2035: National Sustainable Tourism Strategy,[44] which outlines several exploratory scenarios evaluating the future contribution of tourism to the economy up to 2035. Under the desirable scenario,[45] the tourism sector's GDP contribution would be 16.38 percent, with a revenue of €13.3 billion, in 2035 (US$14.5 billion at an exchange rate of €0.91 to US$1). However, climate risks and environmental degradation could jeopardize such a strong contribution.

A World Bank study[46] shows that direct economic costs associated with climate impacts could reach more than US$986.5 billion by 2030, escalating to a staggering US$3.6 trillion by 2100.[47] Investing in an ambitious adaptation approach as part of a broader blue economy plan, could reduce these projected losses to US$2.97 billion, leading to savings of over US$600 million.[48]

Investment in the tourism sector has been relatively stable, at about TD 200 million (US$64.6 million) since 2010 from a peak of almost TD 400 million (US$129.3 million). Most investment was directed towards increasing bed capacity and addressing the issue of aging infrastructure. Aligning infrastructure upgrade investments with climate resilience and sustainability objectives could protect the sector's contribution to the economy and support the emergence of new opportunities.

Demand for coastal tourism in Tunisia may also be affected by the shifts in consumer preference and the emergence of sustainable travelling trends. For example, the cruise ship sector—an important component of Tunisia's tourism development strategy—has increased significantly, driven by the development of new ports and improved infrastructure along the Tunisian coastline.[49] To remain competitive against other Mediterranean ports and contribute to reducing the government's current account and budget deficit, Tunisian ports need to engage in sustainable cruising initiatives similar to the Cruise 2030 initiative working group initiated by European port cities to discuss the sustainability of the cruise industry.[50]

Promoting blue and green economy principles in the tourism sector through adoption of renewable energy, energy efficiency, electric mobility, and better waste management practices and related circular economy concepts has two advantages. First, it could reduce the weight of fossil fuel subsidies on government finance and help reduce the government budget deficit and vulnerability to energy price shocks. Second, it could reduce energy and water expenditure for coastal tourism operators, improve their profitability, and potentially reduce non-performing loans (NPLs) in the portfolios of public financial institutions and enhance financial system stability.[51] The profitability of the tourism sector has been a risk to financial stability in Tunisia in the past, especially for public banks. The balance sheets of the public banks that finance the tourism sector concentrate a large portion of NPLs and are thus vulnerable to poor performance in the tourism sector.[52]

Fisheries and aquaculture are export-oriented sectors that could help increase Tunisia's foreign exchange reserves while providing additional growth and job opportunities as it modernizes and embraces sustainability practices. Sea products are the second largest agricultural export after olive oil in Tunisia, with an annual revenue of TD 248 million (US$80.2 million).[53]

Tunisia has 41 ports equipped with the storage and distribution infrastructure necessary for industrial and artisanal fishing. Fisheries and aquaculture play an important role in the Tunisian economy[54] as they represent 8 percent of agricultural output, 17 percent of agricultural exports, and provide 54,000 direct jobs despite an aging fleet and infrastructure.[55] The sector includes a fleet of 13,476[56] boats, of which 41 percent are non-motorized. Tunisia's marine aquaculture sector, particularly the cultivation of wolffish and seabream in offshore cages, has shown remarkable growth. With a current annual output of 17,000 tons, and the potential to nearly double this to 30,000 tons by 2030, the sector's future looks promising. However, while the sector experienced steady annual growth of 20 percent between 2006 and 2015,[57] aquaculture represents only 2 percent of the jobs in the fisheries and aquaculture sector, with fisheries still playing the far more prominent role.[58]

Modernizing the fishing fleet and port infrastructure would increase the productivity and resilience of the fisheries sector and aquaculture in Tunisia. This would not only increase food security in the country, but also enable it to capture a larger portion of global fisheries and aquaculture demand as the world pursues food security objectives.

Europe imports approximately 60 percent of Tunisia's fisheries exports.[59] If the fisheries and aquaculture sectors fail to move to more sustainable practices, access to the European Union—an important export market for Tunisia—could be compromised, reducing the sectors' prospects. Poor sustainability practices in the sector would hinder competitiveness as the EU further implements sustainable fisheries policies.[60]

Boosting exports and enhancing Tunisia's integration in global value chains, as outlined in the 2023–2025 National Development Plan, cannot be achieved without significant investment in maritime transportation. According to the *Institut Tunisien de la Compétitivité et des Études Quantitatives* (ITCEQ, Tunisian Institute for Competitiveness and Quantitative Studies), as of 2020, 95 percent of Tunisia's trade is conducted through eight ports (Bizerte, La Goulette, Radès, Sousse, Sfax, Gabès, Zarzis, and Skhira).[61] In 2020, the maritime transportation sector included 560 companies and employed 6,000 people. Unfortunately, data is scarce on the economic performance of the sector, though the ITCEQ study showed that the national maritime transport fleet in Tunisia consisted of eight vessels, and that maritime transport cost the country 2 percent of GDP annually due to a weak connectivity to the global maritime transport network. As Tunisia modernizes its port infrastructure and grows its national merchant vessels fleet, it could also invest in technologies that both decrease the reliance of fossil fuels and increase the resilience of ports to climate change, again contributing to improved fiscal revenues for the government while reducing some of the burden linked to fossil fuel imports.

Finally, implementing strategies and plans already in place to address plastic pollution would reduce the cost of plastic pollution on tourism, fisheries, and maritime trade,[62] which is currently estimated at US$25.6 million. Investment in innovative plastic waste collection and recycling technologies and practices could even offer new avenues for employment and growth.

Blue economy-focused investments and projects could significantly contribute to increasing the resilience of key sectors of the economy, improve public finances, and generate growth and jobs opportunities.

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A prominent blue economy agenda lays the foundation for opportunities while alleviating governance challenges

The blue economy has been integrated into numerous multisectoral national strategies to address the significant challenges to Tunisia's coastline and support the country's sustainable development. The **2023 Ecological Transition National Strategy**[63] presents a forward-looking framework that holistically addresses Tunisia's environmental, social, and economic challenges. This strategic vision recognizes the degradation of the coastline, the loss of marine biodiversity, and poor waste management as key environmental challenges for Tunisia, and integrates the blue economy—as well as a series of associated measures—in many of its pillars.

For instance, the strategy's second pillar focuses on building the adaptation and resilience of the coastline and coastal ecosystems. And the third pillar—on the sustainable management of natural resources and ecosystems—explicitly recommends the "adoption and implementation of the blue economy strategy" as its twenty-fifth action.[64] The strategy and its action plan set out indicators for sustainable fisheries and aquaculture, the protection and restoration of marine and coastal ecosystems, clean marine transportation, marine renewable energy, and a plastic-free coastline.[65] The pillar's twenty-sixth action focuses on extending marine and coastal protected areas.

The fourth pillar of the strategy—on the promotion of sustainable consumption and production modes, as well as the reduction of pollution—identifies the blue economy as a tourism opportunity and links it to Tunisia's National Tourism Strategy by 2035, which promotes sustainable tourism and aims to protect and showcase Tunisia's diverse cultural and natural assets.[66]

Tunisia's **Long-Term Carbon Neutral and Climate Resilient Development Strategy by 2050**[67] also makes extensive mention of the challenges climate change poses to the Tunisian coastal economy and ecosystems. Some identified risks include the degradation of natural assets and infrastructure supporting tourism, agriculture, fisheries and aquaculture, and marine transportation.

Tunisia's commitment to coastal protection and sustainable management is further evidenced by the formulation in 2019 of the National Integrated Coastal Zone Management Strategy and the ratification of the Integrated Coastal Zone Management Protocol in November 2022.

Tunisia demonstrates a clear and multifaceted commitment to integrating the blue economy into its broader vision for sustainable development. However, the successful implementation of the blue economy recommendations of these strategies requires overcoming significant governance and cross-sector coordination challenges.

Despite the vital importance of the blue economy in Tunisia's strategic framework, multiple challenges hinder its implementation.

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One of the primary challenges is the **multifaceted nature of blue economy objectives.** When coupled with the diversity of stakeholders, this multifaceted nature makes aligning interests a complex endeavor. Effective coordination across different sectors, governmental bodies, and private entities demands robust communication, meticulous planning, and seamless cooperation. **The creation of a robust interinstitutional coordination mechanism and breaking silos is, therefore, foundational for the blue economy's development.**

A central issue in Tunisia's pursuit of a robust blue economy is the absence of a clear implementation roadmap to operationalize the country's vision and strategic objectives, as well as a regulatory framework for the blue economy's development. While the blue economy concept has been integrated into the National Development Plan for 2023–2025, the translation of this vision into tangible policies and actions, cohesive legal structures, and efficient planning tools is still not in place. The lack of such a framework may hinder the blue economy's growth, interfere with the effective management of public investments, and make sectoral progress assessments challenging.

Another significant barrier is a lack of access to information about the public expenditures related to the blue economy. Despites efforts by Tunisia to develop and invest in priority blue economy sectors—including the modernization of the fishing and aquaculture sectors, improving the capacity and efficiency of ports, and developing ecotourism and adventure tourism—information is too scarce to determine whether investments in these areas are increasing in a sustainable way. Current expenditure data does not discriminate how investments are realized, making it difficult to draw comparisons between various investment programs. This lack of information curtails in-depth research on the blue economy's status and trajectory and poses hurdles for monitoring the sector's future evolution.

The information deficit concerning public and private sector involvement in the blue economy is a barrier to understanding the role of private sector and the opportunities available to enhance its participation in the blue economy.

The need for strategic and institutional reforms within the blue economy is palpable. While there have been reformative overtures in the 2024 supplementary budget and the national reform program for 2023–2026, there is a need to ensure that these reforms align with sustainable blue economy objectives. Ensuring their congruence with the sustainable growth of blue economy sectors is crucial for the sectors' strategies' successful implementation.

The financial dimensions of the blue economy present another challenge. It is essential to identify the appropriate financing instrument for each type of intervention in the blue economy sector.

In conclusion, multiple issues hinder the potential sustainable development contribution of the blue economy in Tunisia. The governance of Tunisia's blue economy, while layered across multiple stakeholders, needs to be strengthened because fragmented institutions with sometimes overlapping responsibilities can reduce the efficiency and coherence of cross-sectoral actions. Financial constraints exacerbate these challenges, with many institutions operating on limited budgets, leading to the deprioritization of environmental concerns. Coupled with the insufficient integration of private sector initiatives and a lack of consolidated knowledge, these challenges necessitate a well-structured response that promotes intersectoral communication, sustainable financing, and the conscientious and sustainable use of marine and coastal resources.

The proposed roadmap in Chapter 3 is a pragmatic response to move Tunisia's blue economy agenda forward, seizing all the opportunities it offers and considering all the challenges it faces.

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2

World Bank Support to Unlock Tunisia's Blue Economy Potential

The World Bank has played a pivotal role in supporting the Tunisian government's efforts to harness the potential of a blue and resilient economy as a catalyst for sustainable development. This collaboration began in 2021 and is based on strong stakeholder engagement and consultation processes that facilitated the development of a comprehensive blue economy diagnostic report.

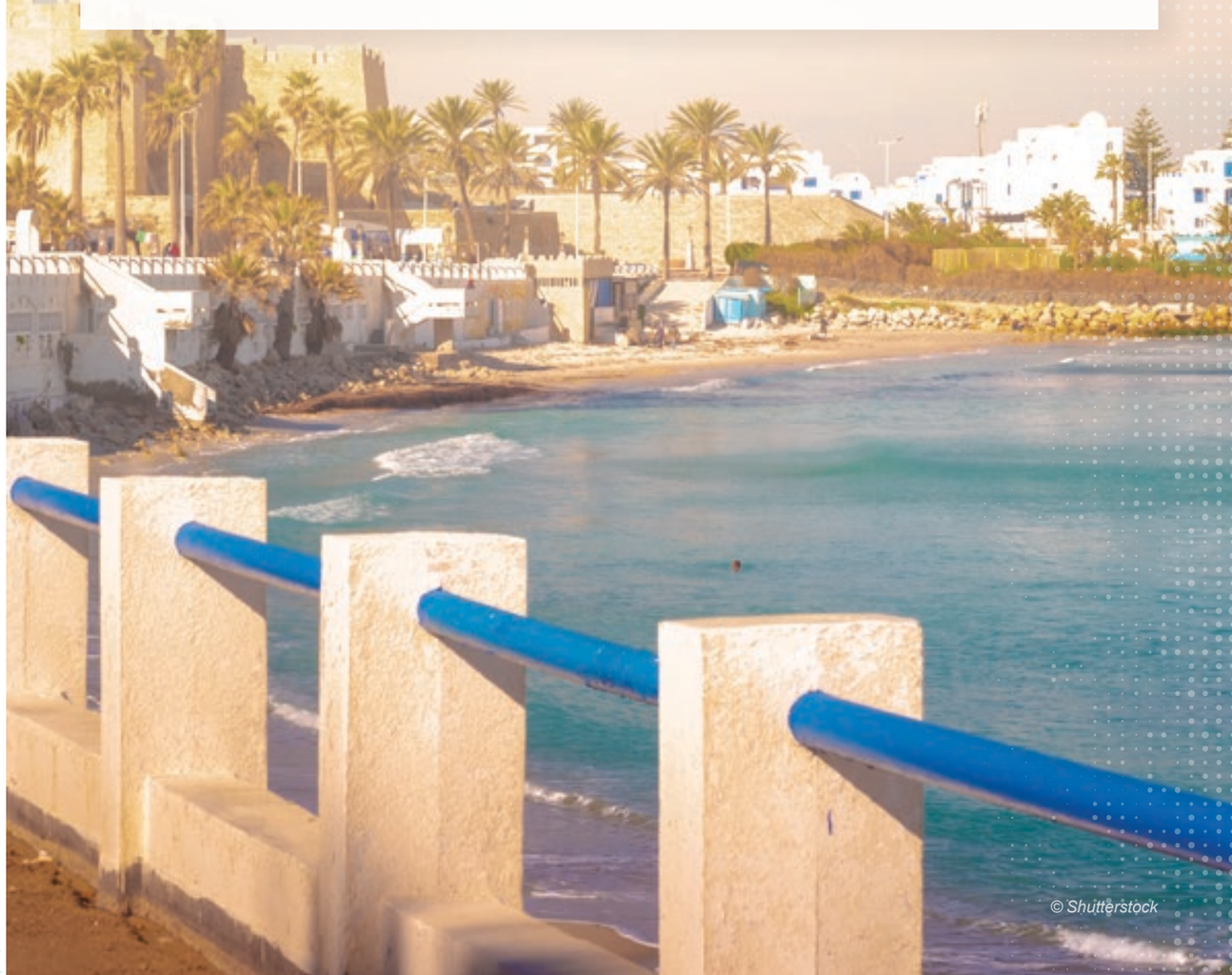

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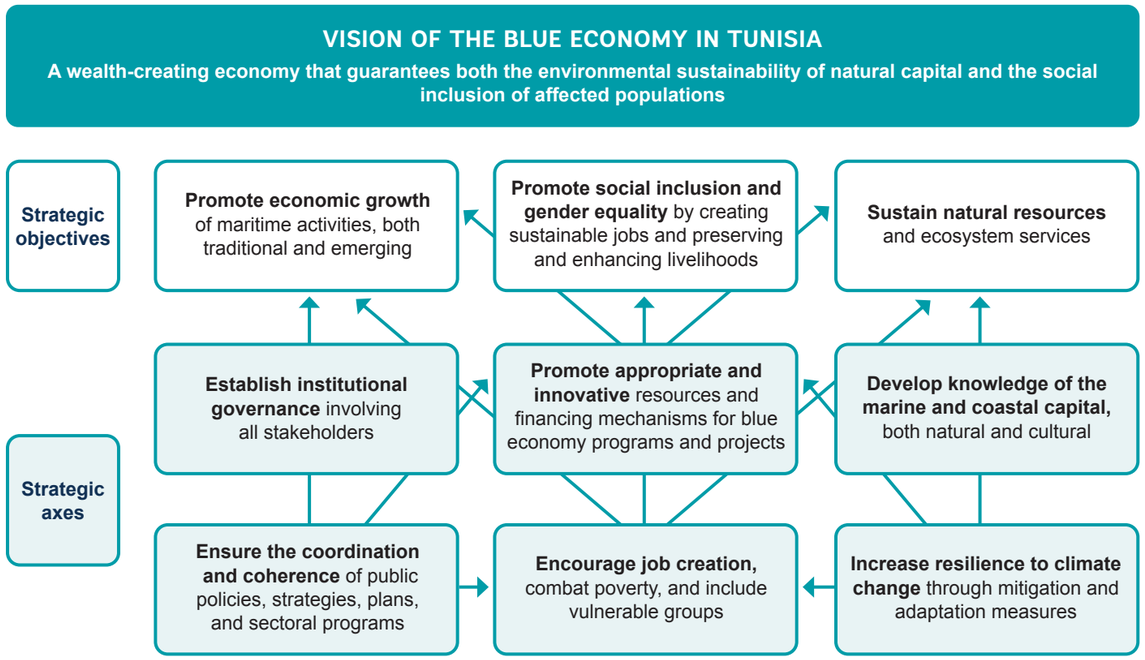
Figure 1: Theory of change for the blue economy in Tunisia



MAIN CHALLENGES

1. **Creation of wealth with socioeconomic benefits** for current and future generations
2. **Preservation of natural capital** by protecting and restoring biological diversity and marine ecosystems
3. **Adaptation and resilience** to the intensifying impacts of climate change

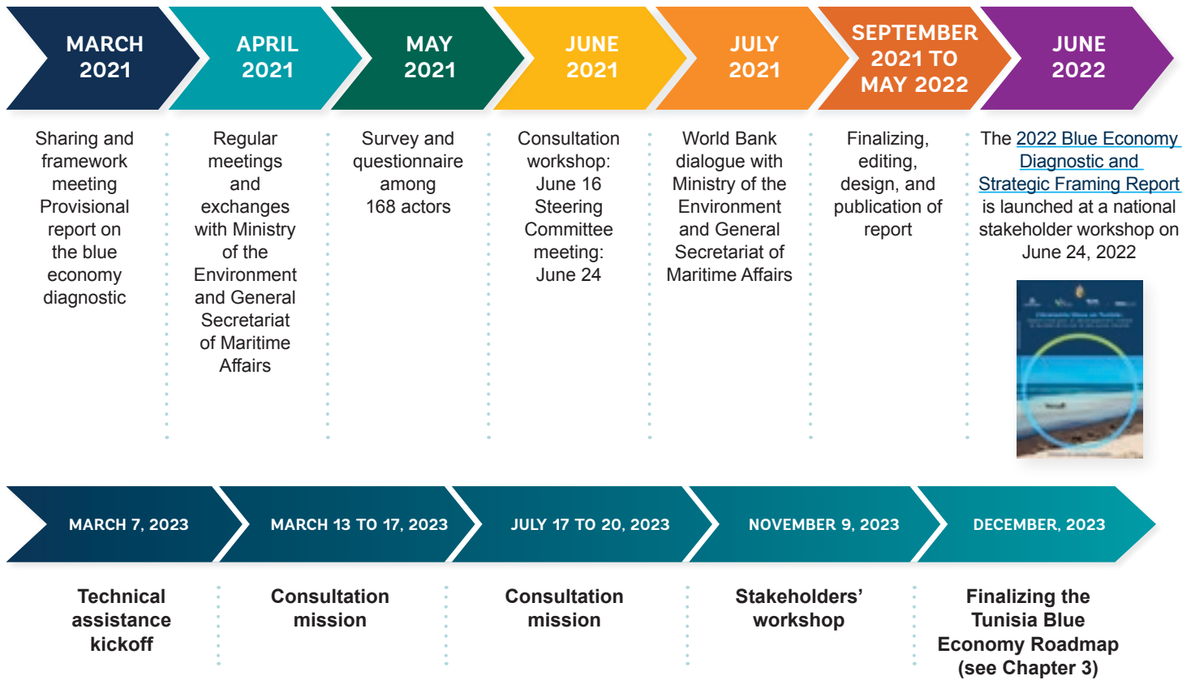
Published in June 2022, the diagnostic report laid the groundwork for a deeper understanding of the opportunities and challenges of the blue economy in Tunisia. Building on these insights, the following deep dive analyses were undertaken and produced to support the development of the roadmap presented in Chapter 3:

- A policy and institutional gap analysis and vision consultation,
- A Blue Public Expenditure Review,
- An analysis of innovative financing and private sector investments in blue sectors,
- An assessment and design of an integrated database for the Blue Economy,
- Analytical and technical work on combating the impact of climate change (coastal erosion and marine submersion) on coastal development in Tunisia, in particular on the tourism value chain,
- A note on blue carbon in the Middle East and North Africa Region,
- An ecosystem assessment to support blue carbon evaluation in Tunisia,
- A strategy for a plastic-free coastline (LISP) diagnosis and draft action plan for the reduction of marine pollution by plastic and promotion of circular economy approaches,[68] and
- Sectoral analyses to promote sustainable and climate change resilient blue investments in coastal tourism, fisheries, and aquaculture, as well as on maritime transport.

The roadmap was formulated through a series of consultations and meetings, ensuring a broad and inclusive approach. The initial stage was set in motion with a kickoff meeting on March 7, 2023. This was followed by focused stakeholder consultation meetings, which were held during two missions from March 13 to 17, 2023, and from July 17 to 20, 2023. These consultations provided valuable insights and perspectives from various stakeholders, further shaping the roadmap's development.

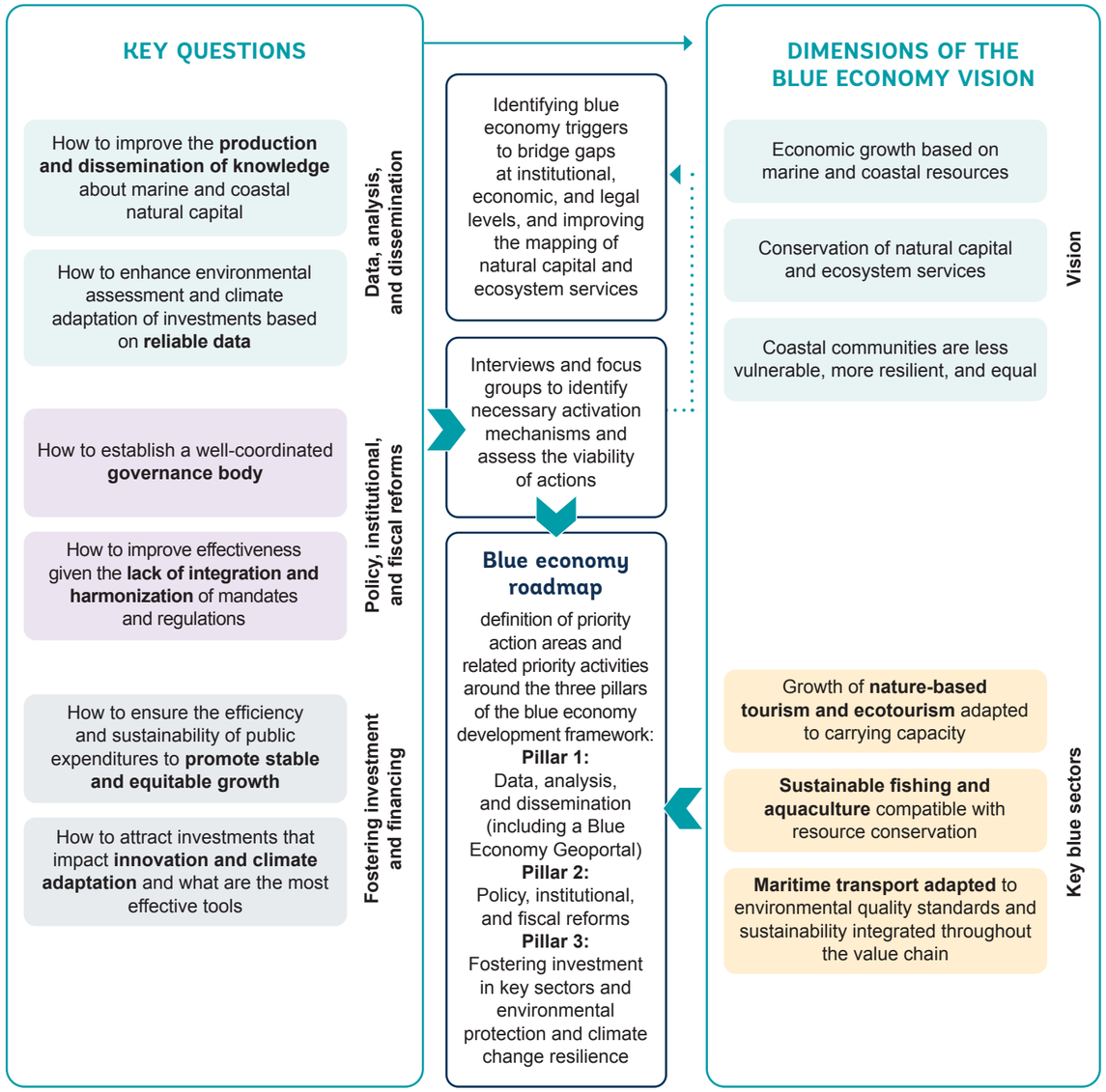
The stakeholder workshop held on November 9, 2023, was a critical milestone on this journey. This event served as a platform to finalize the proposed roadmap and integrate feedback and inputs gathered throughout the consultation process. The workshop underscored the commitment of all involved parties to foster a sustainable and resilient blue economy in Tunisia that aligns economic growth with environmental stewardship and social inclusion.

Figure 2: From the initial diagnostic report to the final roadmap



Articulated around the blue economy development framework outlined by the World Bank (2022), the deep dive analyses helped to answer key questions through targeted research, stakeholder engagement, and comprehensive data analysis. This approach focused on various dimensions of the blue economy, aligning with a vision that emphasizes economic growth based on marine resources, the conservation of natural capital and ecosystem services, and the creation of resilient, equitable coastal communities. The analyses specifically addressed how to improve the generation and transmission of knowledge about marine and coastal natural capital, enhance environmental assessment and climate adaptation of investments, and improve governance.

Figure 3: Logical framework and working hypothesis



The series of studies delved into key sectors of the blue economy, including sustainable nature-based tourism, fishing and aquaculture compatible with resource conservation, and maritime transport that adheres to environmental quality standards and integrated sustainability throughout the value chain. By examining these sectors, the analysis pinpointed critical areas for investment and policy intervention that were aligned with Tunisia's environmental sustainability and economic growth priorities.

The final result is a roadmap that focuses on the three key pillars outlined in the blue economy development framework, namely:

- Data, analysis, and dissemination,
- Policy, institutional, and fiscal reforms, and
- Fostering investment.

3

The Three Pillars of the Blue Economy Roadmap

Strategic actions are required to harness Tunisia's blue economy potential while considering the country's challenges and sustainable development priorities. The roadmap proposed for Tunisia draws on the three pillars of the World Bank's Blue Economy Development Framework,[69] which recognize the centrality of data and knowledge, the need for institutional reforms, and urgency of budgetary realignment as well as the need for blue investments to generate economic growth and development outcomes. Each of the proposed pillars includes priority action areas and related priority activities aimed at transforming the challenges Tunisia faces into sustainable opportunities for Tunisia's maritime and coastal sectors.

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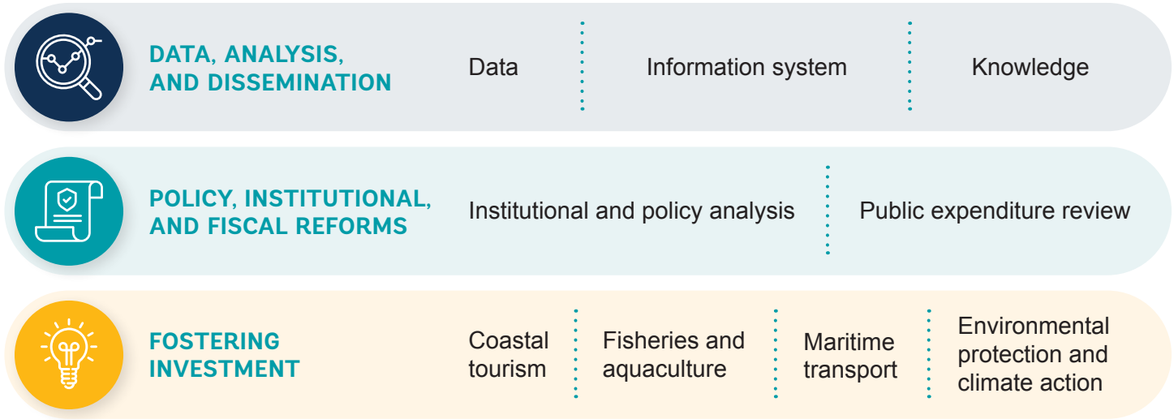
Figure 4: The three pillars of the blue economy roadmap

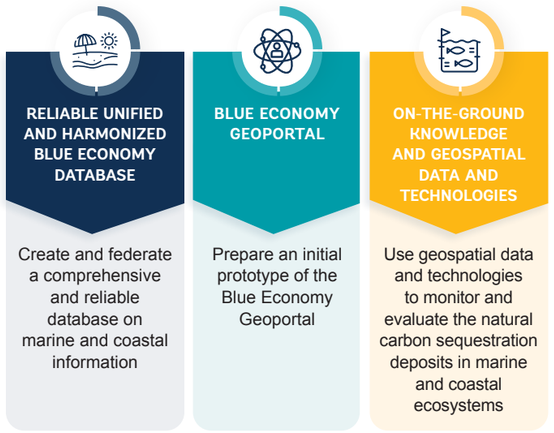


The roadmap for Tunisia's transition focuses on **11 priority action areas,** setting out 31 long-term objectives and **36 specific activities** (which are categorized by urgency into short-, medium-, and long-term activities) within a five-year program. This roadmap clearly delineates responsibilities between stakeholders to ensure accountability and collaborative effort. An adaptive management system with robust monitoring and evaluation mechanisms will be crucial for the roadmap's effective implementation. Such mechanisms include clearly defined indicators with targeted results to allow for ongoing assessment, with the scope to make necessary adjustments to ensure progress towards sustainable management of coastal and marine resources.

Pillar I: Data, analysis, and dissemination

The 2022 Blue Economy Diagnostic and strategic framing report[70] highlights the need to design and develop an integrated, multisectoral information system for Tunisia's blue economy. This system should incorporate climate-related data in acknowledgment of the critical role that data management plays in guiding decisions on the sustainable use of coastal and marine resources.

Figure 5: Proposed priority action areas and activities relating to Pillar I



Based on the diagnostic reports guidance, the roadmap's first pillar focuses on the collection, analysis, and dissemination of data to create and enhance knowledge relating to key sectors of Tunisia's blue economy. Two reports were produced: one focusing on benchmarking and identifying needs, and the other proposing the design for a future integrated database and related geoportal[71] to enhance transparency and access to information.

The following work was undertaken to determine the characteristics of the proposed geoportal:

- **A comparative analysis of blue economy databases and geographic information systems.** This involved reviewing international best practices, existing national databases, and specific needs to develop an integrated geoportal for the blue economy in Tunisia.
- **A design for the geoportal was proposed.** This involved creating a design dossier based on the comparative analysis results. The design envisages a centralized platform, with secure access levels, that provides users with access to integrated data on the blue economy.

COMPARATIVE ANALYSIS OUTCOMES TO DESIGN A GEOPORTAL

The following key outcomes emerged from the comparative analysis:

- **Current situation:** Stakeholders use a diversity of data covering various themes. However, spatial referencing is often lacking.
- **Limitations of existing portals:** Identified issues included a lack of dynamism, irregular updates, low interactivity with little ability to answer custom queries, and a predominance of PDF-format data often unrelated to the blue economy.
- **Stakeholder expectations:** Stakeholders would welcome a tool for communication and data-sharing where strategies, programs, and projects related to the blue economy could be centralized.
- **Need for a dedicated Blue Economy Geoportal:** The analysis identified the need to harmonize existing data, facilitate information-sharing, and address the gaps in current portals.

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CREATING DATA AND SHARING KNOWLEDGE

As part of creating data and sharing knowledge about coastal and marine ecosystems through the geoportal (Box 1), an analysis to evaluate blue carbon potential was performed using satellite technologies to monitor blue carbon sequestration in coastal and marine ecosystems. The analysis (Box 2) also included an assessment of the economic potential of blue carbon sequestration in Tunisia and the Middle East and North African region. Overall, Tunisia is the third country in the area (after Saudi Arabia and Yemen) in terms of its blue carbon potential and economic value. The next objective is to enhance the knowledge and use of new technologies to assess and monitor carbon sequestration rates by marine and coastal ecosystems.

BOX 1: TUNISIA'S PROPOSED BLUE ECONOMY GEOPORTAL

The Tunisia Blue Economy Geoportal[72] is conceptualized as an innovative digital platform designed to facilitate a comprehensive understanding and exploration of the nation's blue economy. Its architecture should encompass a broad array of sections to provide targeted insights. Ideally, the homepage would feature a menu bar directing users to essential topics while providing context regarding the portal's objectives and services. The homepage could also include sections for the latest news and upcoming events related to the blue economy.

Figure 6: The Tunisia Blue Economy Geoportal

The following sections are proposed for the geoportal:

- **Indicators.** This section could offer detailed quantitative and qualitative data on the economic, environmental, and social dimensions of Tunisia's blue economy.
- **Dashboard.** This section could provide a holistic view of the sector's performance, integrating statistics and key indicators.
- **Mapping** could deliver critical geospatial information, empowering users to explore and analyze geographic data related to the blue economy.
- **About Us** could outline the portal's mission, governance, and contact information, establishing a transparent communication channel with users.
- **Projects** could offer insights into ongoing and completed projects related to the blue economy.
- **Themes** could provide thematic insights and resources on various aspects of the blue economy such as fisheries, aquaculture, marine transport, and coastal tourism.
- **Resources** could provide users with an array of resources, including documents, photos, videos, maps, and policy information.

The geoportal's proposed design combines a user-friendly experience with a robust authorization management system that provides customized access based on user roles and needs. Robust access control is essential to ensuring both efficient and secure use of the portal's diverse functionalities.

BOX 2: SEAGRASS MEADOWS IN TUNISIA—AREA AND CARBON SEQUESTRATION POTENTIAL

A World Bank-commissioned study executed in 2023 by Planetek Italia using Copernicus Sentinel-2 satellite imagery, complemented by in situ data published by the *Institut National des Sciences et Technologies de la Mer* (INSTM, National Institute of Marine Sciences and Technologies) in 2013,[73] evaluated the extent of seagrass meadows in the Gulf of Gabès and around the Kerkennah Islands. The study focused on mapping *Posidonia oceanica* and *Cymodocea nodosa* seagrass species, with a notable decrease in their total area from 2017 to 2022. The data showed a **5 percent reduction in the seagrass meadows'** coverage (Table 2), highlighting environmental variability and challenges such as water turbidity and a **reduction in its carbon sequestration potential.**

Figure 7: Seagrass meadows for reference years 2017 (left) and 2022 (right)

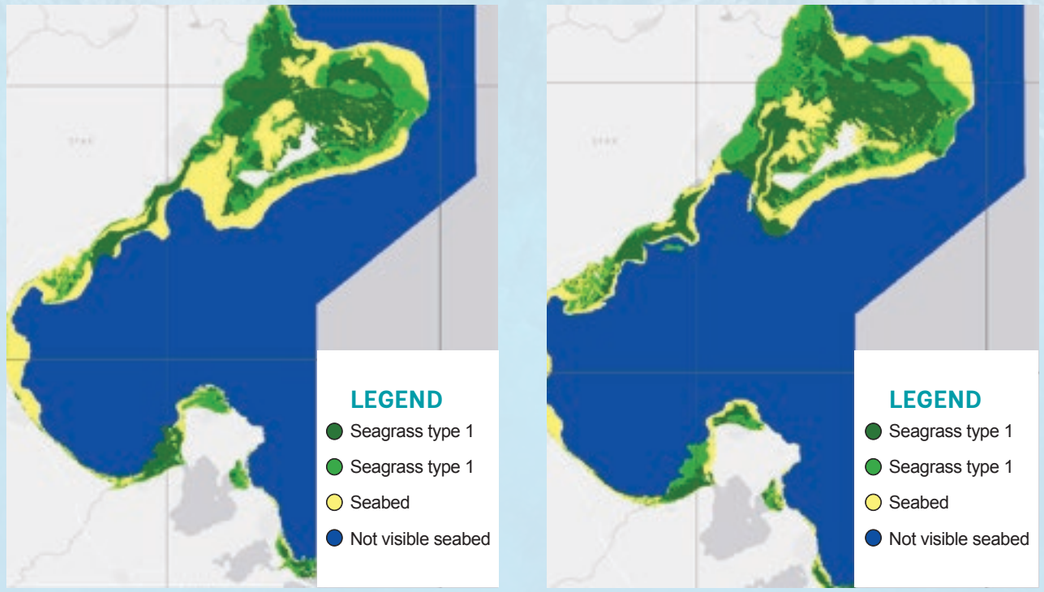

Table 1: Area of seagrass meadows per year (km²)

Seagrass meadows type	2017	2022
Type 1	2,079	1,996
Type 2	1,450	1,368
Total	3,529	3,365

Table 2: Total area of seagrass meadows and total carbon sequestered

Year	2017	2022
Seagrass meadow area	3,529 km²	3,365km²
Total carbon sequestered	1,422.144 (tCO_2e)	1,355.960 (tCO_2e)

Seagrass meadows are highly productive ecosystems capable of sequestering significant amounts of carbon. Estimates based on available literature data revealed the total carbon sequestered by these meadows in 2017 and 2022, showing a slight decrease in line with the reduction in meadow area (Table 2).

Satellite imaging, combined with in situ data, provides valuable insights into the distribution and dynamics of seagrass meadows. However, challenges in data acquisition, processing, and interpretation persist. Enhancing knowledge of these crucial marine ecosystems, pivotal carbon sinks, and reinforcing policies for their conservation is imperative.

The Tunisian blue economy roadmap plans to integrate this data into a blue economy database and proposes measures for marine ecosystem conservation, including the management of MPAs, which are essential for ecosystem preservation and climate change mitigation and adaptation.

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PRIORITY ACTION AREAS AND RELATED PRIORITY ACTIVITIES

The following priority action areas and related priority activities were identified in the blue economy roadmap:

- **Establish a reliable, unified and harmonized blue economy database covering marine and coastal areas.** This activity involves creating an extensive, combined, reliable database of marine and coastal information and emphasizes the collection of accurate, reliable, and up-to-date data.
- **Develop an integrated, multisectoral information system on the blue economy (a Blue Economy Geoportal).** This activity involves preparing a prototype that can then be refined and enhanced to ensure functionality, stability, and to allow for regular updates.
- **Improve on-the-ground knowledge and leverage geospatial data and technologies to monitor and assess blue carbon (carbon sequestration rates by marine and coastal ecosystems).** This priority activity uses geospatial data and technology to monitor and assess the natural carbon sequestration potential in marine and coastal ecosystems, with a particular focus on seagrass meadows and wetlands. One objective of this activity is to estimate how much soil carbon has been emitted from the loss of meadows ecosystems.

Pillar II: Policy, institutional, and fiscal reforms

The 2022 Blue Economy Diagnostic report emphasizes the need for a strong coordination function to transition towards a blue and resilient economy and incorporate blue economy principles into existing regulatory frameworks. It highlights the need for a comprehensive review of blue public expenditure to analyze public policies—particularly in budgetary and fiscal matters—and to identify strengths and areas for improvement that can either foster or hinder the development of the blue economy. Key areas for improvement are:

- Improve interinstitutional coordination, and
- Improve the efficiency and sustainability of public expenditures related to the blue economy.

IMPROVE INTERINSTITUTIONAL COORDINATION

The analysis of the institutional framework and sectoral policies[74] identifies that a strong interinstitutional coordination mechanism is essential to maximize the benefits and minimize environmental and social risks of developing the blue economy (activities corresponding to Pillar II). In order to evaluate the existing framework and policies, three activities were undertaken:

- **A policy framework analysis was conducted.** This analysis provided a thorough review of the policy framework as defined by strategies relating to the blue economy. It included an examination of legal texts and technical documents on regulatory instruments implemented in the country, aiming to understand the current institutional organization and its effectiveness.
- **A comparative international case analysis was conducted.** This analysis focused on examining successful blue economy strategies and their institutional configurations from around the world. The objective was to glean insights and best practices that can be adapted to the Tunisian context.
- **Stakeholder consultations for vision alignment were held.** Engaging stakeholders is crucial for understanding the roles that different institutional actors can play in developing the blue economy. This action also sought to identify key institutional and governance needs and obstacles that will need to be overcome to ensure coordinated and effective implementation (see Box 3).

The analysis indicated that an interinstitutional coordination mechanism would need to have the following functions:

- Coordinate policies and institutional framework at multiple levels,
- Provide support for national governance of coastal and marine resources,
- Enhance financial sustainability and mobilize resources in a coordinated way,
- Coordinate programs and monitor progress towards sustainability, and
- Provide complementary functions such as knowledge management, capacity-building, and awareness raising as required, whether on a regular or intermittent basis.

BOX 3: STAKEHOLDERS' PERSPECTIVES ON BLUE ECONOMY GOVERNANCE IN TUNISIA

The analysis of the institutional framework was underpinned by a review of legal documents and secondary sources, as well as extensive consultations with significant stakeholders to understand the roles played by each institution in the blue economy's development, and to highlight the main challenges hindering its growth.

These consultations[75] highlighted the complexity of the blue economy ecosystem. To kickstart the process, a stakeholder consultation workshop was organized to bring together representatives from 20 institutions. This workshop highlighted several critical areas that need attention in Tunisia's blue economy governance and implementation roadmap, namely:

The regulatory framework. Stakeholders emphasized that the current regulatory framework needs significant updating and harmonization, especially regarding coastal management. Existing legislation, such as the law that created APAL, needs to specify clearer roles and mandates. The participants also called for the legal definition and geographical delineation of the coastline. Matters relating to water treatment, waste management, energy efficiency, and the imposition of penalties for non-compliance or adverse environmental impacts were seen as paramount.

Current governance and innovation. The current governance structure was seen as inadequate, with a need to define responsibilities and overlapping mandates between different institutions intervening with coastal and marine areas. Stakeholders highlighted the need for a cross-sectoral governance group with better technical and financial capacities. There was a perceived lack of innovative knowledge and effective communication, with data and information often siloed within departments.

Proposed governance improvements. Drawing from best practices in other countries, more efficient use of resources, improved legislation updates, better knowledge and specialization in the blue economy field, and improved management of maritime activity authorizations were among the suggestions for governance enhancement.

Suggested institutional arrangements. Stakeholders have suggested a number of institutional structures to coordinate blue economy actions, while calling for their specific mandates to be reinforced. They also highlighted a need to revise the legislation governing maritime public domain use and recognized that real change in management would require time. The key observation that emerged was that none of the current institutions would be able to provide the strong intersectoral coordination that is required to lead development of the blue economy.

Challenges for the coordinating body. Effective communication with other institutions involved in the blue economy, legitimacy among other institutions and citizens, understanding and commitment to sustainability, addressing perceptions of being an "obstructive" institution, creating a conducive climate for planning, and the ability to conduct or oversee high-quality technical studies, such as environmental impact assessments, are some of the challenges the coordinating body would need to overcome.

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The analysis of the institutional framework proposed that an interinstitutional coordination mechanism could consist of three components:

- **An Interministerial Steering Committee (COPIL).** This would be a high-level body responsible for setting priorities and strategic orientations.
- **A General and Programmatic Coordination Structure.** The structure would be responsible for institutional coordination, harmonizing actions, monitoring progress, evaluating performance, and guiding implementation.
- **A Sectoral Execution Structure.** This structure would be allocated to various sectoral structures (ministries and government agencies) under the oversight of the Program Management Unit (PMU) for technical monitoring and result evaluation.

OPTIONS FOR A SECTORAL EXECUTION STRUCTURE

The Sectoral Execution Structure would bring together all sectoral ministries, specialized government agencies, and research institutions that may be involved in the implementation of actions linked to the development of the blue economy.

Two scenarios were evaluated for the Program Management Unit:

- **Scenario 1:** Integrated within the general and programmatic coordination body, and
- **Scenario 2:** Within an external structure (the Ministry of Environment or APAL).

The choice depends on the operational capacity, available resources, and required expertise.

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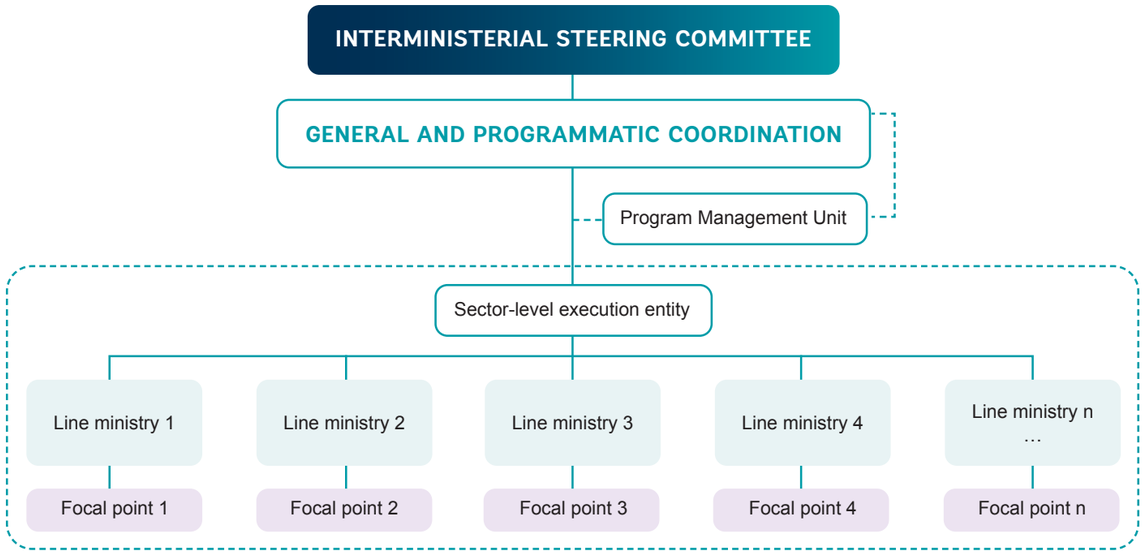
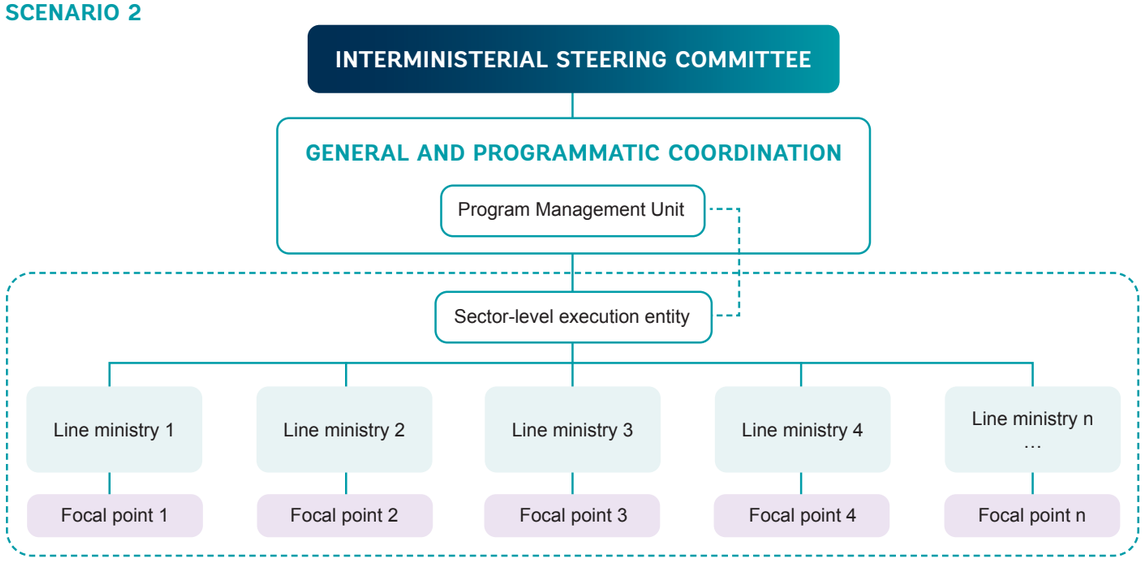
Figure 8: Proposed scenarios for the interinstitutional coordination mechanism[76]

SCENARIO 1



SCENARIO 2



Source: World Bank.

PRIORITY ACTIVITIES TO IMPROVE INTERINSTITUTIONAL COORDINATION

The institutional framework and policies analysis identified the following priority activities to improve the interinstitutional coordination:

- **Establish an interinstitutional coordination mechanism,**
- **Strengthen skills and provide appropriate training** to ensure the effectiveness of the interinstitutional coordination mechanism, and
- **Develop and use a monitoring and evaluation system** for the implementation of the roadmap.

The Ministry of Economy and Planning and CGDSR; CMAM and SGAM; the Ministry of the Environment and APAL; the Ministry of Finance; the Ministry of Agriculture, Hydraulic Resources, and Fisheries; the Ministry of Tourism and Craft; and several other environmental regulation and control agencies could be at the forefront of this initiative.

Improve the efficiency and sustainability of public expenditures related to the blue economy

In addition to the analysis of the institutional framework, a Blue Public Expenditure Review was conducted to evaluate public policies related to the blue economy, in line with existing budget allocations and fiscal mechanisms.

The main objective of the review, which followed World Bank guidance, was to identify insufficient public spending, excessive expenditures harming the marine environment, and missed opportunities for generating public revenue through the blue economy.

Key findings of the review highlight the lack of data to clearly link current investments in Tunisia's blue economy, such as fishing modernization and ecotourism development, to a positive impact on increasing investments and attracting foreign investors. Remarkably, less than 1 percent of the state's total 2023 budget seemed to be directly allocated to the blue economy, indicating a need for a strategic approach to stimulate this sector.

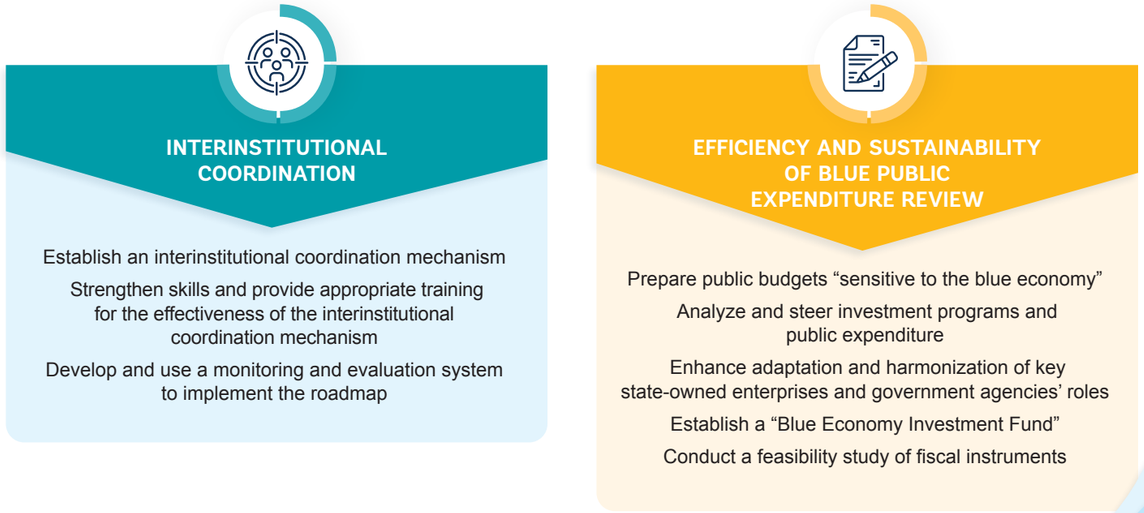
Current public expenditures appear inadequate to support the blue economy and minimize negative impacts on coastal and marine ecosystems. Furthermore, some public expenditures—like those in infrastructure construction and transport—could impact blue natural capital, requiring adjustments to reduce these impacts. Potential public revenue opportunities related to blue natural capital were probably missed due to insufficient detailed information.

PRIORITY ACTIVITIES TO IMPROVE THE EFFICIENCY AND SUSTAINABILITY OF PUBLIC EXPENDITURES RELATING TO THE BLUE ECONOMY

Based on the review's findings, several priority activities are proposed to improve the efficiency and sustainability of blue public expenditures:

- **Prepare public budgets sensitive to the blue economy.** This involves creating detailed and transparent analyses of the sustainability and effectiveness of public expenditures related to the blue economy, along with their monitoring and evaluation mechanisms.
- **Analyze and steer investment programs and public expenditure,** focusing on the development of the blue economy and general ecological transition.
- **Enhance adaptation and harmonization of key state-owned enterprises and government agencies' roles,** particularly those involved in the blue economy.
- **Establish a Blue Economy Investment Fund** through a public private partnership to channel strategic investments into projects like sustainable fishing, renewable marine energies, and the protection of marine and coastal ecosystems.
- **Conduct a feasibility study of fiscal instruments** to identify the most effective and equitable fiscal tools (such as tax credits, investment bonuses, and tax exemptions) to promote the blue economy, while considering already supported environmental activities.

Figure 9: *Proposed priority action areas and activities relating to Pillar II*



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Pillar III: Fostering investment

In alignment with the key recommendations of the 2022 Diagnostic Report, a comprehensive examination was conducted to review existing financial mechanisms that could help promote, develop, and scale blue investments (specifically in the coastal tourism, fisheries and aquaculture, and marine transportation sectors) that also support environmental protection and climate action.

Figure 10: *Proposed priority action areas and activities relating to Pillar III*

Develop sustainable and resilient coastal tourism

Transitioning to sustainable coastal tourism is crucial, especially considering the challenges posed by climate change and other threatening factors. This transformation is aligned with the Sustainable Tourism Strategy 2035, which aims to convert the tourism industry into a more regenerative and resilient one. Identified key challenges include:

- Coastal erosion and marine submersion,
- Loss of marine and coastal biodiversity,
- Increasing marine pollution, notably from plastics, and
- Mass tourism pressures.

Ecotourism emerged as a potential solution for sustainable development because it promotes conservation of the natural environment and active local community participation.

Further analysis identified key catalysts for optimizing sustainable coastal tourism, including **investment in knowledge, collaboration, local investments, training, and the development of sustainable infrastructure.** When managed with specific criteria and in harmony with ICZM approaches, ecotourism can enhance the resilience of the tourism sector and stimulate socioeconomic development without compromising the environment.

PRIORITY ACTIVITIES TO PROMOTE COASTAL ECOTOURISM

Based on the analysis, the following priority activities are proposed to promote sustainable coastal tourism development in Tunisia:

- **Develop and establish guidelines for the development of sustainable coastal tourism.**
- **Structure and deploy multistakeholder pilot projects ("demonstration experiences")** for ecological and energy transition in the tourism sector.
- **Develop thematic ecotourism offerings for biodiversity preservation and carbon footprint reduction.** Create ecofriendly tourism packages that focus on preserving biodiversity and reducing carbon footprints.
- **Develop training and support for stakeholders in implementing best tourism practices.** Educate and assist tourism operators to adopt sustainable tourism practices.
- **Identify and promote "Sustainable Tourism Champions" in Tunisia.** Recognize and showcase successful sustainable tourism initiatives and operators as models for emulation within the industry.

Enhance the fisheries and aquaculture sectors

The analysis of Tunisia's fisheries sector reveals significant gaps that need to be addressed to strengthen this vital component of the blue economy. Key findings include:

- **A lack of comprehensive mapping and systematic assessment of fish stocks.** The absence of detailed mapping of commercial fishery resources and systematic stock assessments hinders effective management and sustainable exploitation of these resources.
- **The need for enhanced data collection and scientific observation.** Improved scientific data collection and fishery statistics is critical. This involves greater involvement of fishers in data collection and increasing the presence of scientific observers on fishing vessels.
- **Governance and legal framework improvements.** Recommendations include the development of management plans for key species, enhanced co-management and governance structures, fishing law reform, the creation of a national plan to prevent illegal fishing, and renovation of the *L'Agence des Ports et des Installations de Pêche* (APIP, Agency for Ports and Fishing Facilities).

The analysis of Tunisia's aquaculture sector identified several opportunities to guide the sustainable growth of this sector. These opportunities include:

- **Establishing and managing allocated zones for aquaculture (ZAA) within the marine spatial planning framework.** There is a need to effectively establish and manage ZAAs to minimize negative environmental and socioeconomic impacts and balance the use of maritime space to prevent conflicts with other activities.
- **Building capacity and skills.** Strengthening the skills and capacities of aquaculture professionals is crucial for the advancement of this sector. A capacity-building program to develop an integrated program to improve fry mortality management would enhance overall aquaculture efficiency.
- **Updating the Aquaculture Master Plan.** The Aquaculture Master Plan needs to be updated with a medium to long-term strategy that incorporates technological advancements and considerations of maritime space use.
- **Modernize outdated aquaculture infrastructure.** Upgrading obsolete aquaculture infrastructure is a priority for the sector's modernization.

Despite challenges, the aquaculture sector holds potential to mitigate the impacts of overfishing and contribute to the growth of the blue economy, provided sustainable practices are adopted.

PRIORITY ACTIVITIES TO ENHANCE THE FISHERIES SECTOR

The following activities are proposed to promote sustainable development in the fisheries sector:

- **Develop and implement a participatory information collection protocol.** Establish and implement an information collection protocol involving fishers, including a list of indicators, scientific observer assistance on fishing boats, and a standardized data recording system with regular updates.
- **Map and assess key commercial stocks using sustainability indicators.** Create detailed maps and assessments of key commercial stocks based on sustainability indicators (key performance indicators or KPIs). These insights, integrated into the database proposed in Pillar I, would inform decision-making in the fisheries sector.
- **Update and complete management plans for key fisheries species and areas.** The management plans for the country's primary species and zones should be updated and enhanced through more participative and sustainable management. This should be based on existing information about stock trends and future projections, considering vulnerability factors.
- **Promote artisanal fishers' inclusion in sustainable resource management.** Encourage the inclusion of fishers in the sustainable management of fishery resources through co-management and participative management models. This should be in line with the principles and objectives of ICZM and should promote ecosystem-based fisheries approaches.
- **Develop and implement an integrated monitoring and control plan for fishing activities.** Implement a comprehensive plan for monitoring and controlling fishing activities to achieve predefined objectives. A key focus of this plan would be to contribute to the recovery and preservation of biodiversity, ensuring that fishing practices are sustainable and aligned with environmental conservation goals.
- **Strengthen the implementation of the National Action Plan for the Eradication of "kiss trawling" and the legal framework supporting it.** Enhance the implementation of the national action plan to eradicate "kiss trawling" and support the plan with a robust legal framework.
- **Reform the national legislative framework on fishing.** This includes reforming existing laws, such as Law No. 94-13 related to fishing practices.

PRIORITY ACTIVITIES TO ENHANCE THE AQUACULTURE SECTOR

The following priority activities are proposed to promote sustainable development in the aquaculture sector:

- **Establish allocated zones for aquaculture within the marine spatial planning framework,** minimizing environmental and socioeconomic impacts and negative interactions with other uses.
- **Develop an integrated program to improve fry mortality management in aquaculture** and optimize fish and aquaculture product purification and conservation processes, enhancing ecological and energy efficiency for better productivity.
- **Stimulate the growth of the local blue economy** by launching initiatives that value maritime professions and create sustainable employment and entrepreneurship opportunities, especially for youth, women, and small producers, in alignment with other existing cooperation initiatives.

Enhance the resilience and competitiveness of maritime transport

The analysis of Tunisia's maritime transport sector highlights its central role in Tunisia's integration in the global value chains and its significant impact on the country's economy. Key findings include:

- **Global value chains.** Maritime ports are pivotal in modern economies, offering undeniable opportunities. Tunisia's ports are crucial for economic growth, exports, revenues, and marine resource preservation.
- **Challenges and opportunities.** Despite its importance, as evidenced by 2021 data from the *Office de la Marine Marchande et des Ports* (OMMP, Merchant Marine and Ports Office), the sector faces challenges in infrastructure improvement and enhancing the country's reputation.
- **International competitiveness.** Tunisia's low ranking in international maritime transport indicators underscores the need to bolster the competitiveness of its maritime transportation.
- **Quality index evaluation.** The sector requires improvements to port infrastructure to support resilient growth; fleet renewal to meet international safety standards; capacity enhancement of merchant navy officers; investment in research and innovation for a competitive future; and the development of maritime energy infrastructures, including renewables, for environmental commitment.

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PRIORITY ACTIVITIES TO ENHANCE THE MARITIME TRANSPORT SECTOR

The roadmap proposes the following priority activities to address these challenges and maximize the sector's potential:

- **Support the renewal of the transport fleet to reduce greenhouse gas emissions.** Support the renewal of the maritime fleet to reduce emissions in compliance with Annex VI of MARPOL.[77]
- **Modernize the regulatory framework for port concessions to facilitate and simplify procedures, making them more effective.** Update the legal and regulatory framework governing the granting of port concessions to enhance efficiency and competitiveness.
- **Establish low-carbon refueling infrastructure.** Develop infrastructure to recharge electric vessels (preferably using renewable energy) and provide liquid natural gas in maritime ports and ballast water-treatment stations.
- **Enhance the control and surveillance of safety rules and environmental standards** within the maritime sector.
- **Support research and innovation in the maritime economy.** Create a dedicated position within the Office of Merchant Marine and Ports focusing on research and innovation, specifically tailored to the maritime sector's blue economy.

Strengthen environmental protection and climate resilience

Tunisia has acknowledged the crucial role of environmental protection and climate change mitigation and adaptation within the blue economy.[78] The roadmap focuses on strategic priorities in climate change and ecological transition and incorporates significant studies such as the detailed analysis of climate change impacts on coastal development, particularly the value chain of coastal tourism, and the Tunisia's LISP Strategy and Action Plan. These studies and analyses identified the following challenges:

- **Marine protected area degradation.** Tourism and destructive fishing practices exert pressure on protected zones, jeopardizing their ecological integrity.
- **Marine and plastic pollution.** Key areas along the Tunisian coast, especially major cities and industrial sites like the Gulf of Tunis and Gabès, are afflicted with high pollution levels. Plastic pollution along the coastlines severely impacts marine life and poses risks to human activities, diminishing the appeal for tourism.
- **Climate change and coastal erosion.** Rising sea levels and extreme weather events pose significant threats to biodiversity, infrastructure, and the tourism sector's value chain.
- **Lack of standardized and integrated data.** Decision-making processes are often hampered by the absence of reliable and up-to-date scientific data on vulnerable ecosystems.

PRIORITY ACTIVITIES TO STRENGTHEN ENVIRONMENTAL PROTECTION AND CLIMATE RESILIENCE

The following priority activities are proposed to address these challenges and support the blue economy:

- **Develop and implement robust and adaptive management plans.** Develop and execute effective management plans for MPAs and other environmentally sensitive areas.
- **Map and update ecologically sensitive zones.** Create and regularly update maps of ecologically sensitive areas, including *Posidonia oceanica* and other seagrass meadows, for integration into the proposed Blue Economy Geoportal.
- **Establish a sustainable mechanism to implement and monitor the progress of the Plastic-Free Coastlines strategy** and its action plan.
- **Execute the Plastic-Free Coastlines Action Plan.** Implement the LISP Action Plan, with a particular focus on high-priority projects, to effectively address coastal plastic pollution.
- **Implement coastal and marine ecological restoration and climate adaptation projects.** Establish restoration and climate adaptation projects in identified vulnerable coastal and marine areas, leveraging integrated coastal zone management approaches, community participation, and nature-based solutions.

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Summary of the Blue Economy Roadmap

Table 4 summarizes all priority action areas and proposed activities identified in the report towards the creation of Tunisia's Blue Economy roadmap. A priority level and implementation timeline are provided to drive the Blue Economy agenda.

Table 4: *Summary of roadmap priority action areas and related proposed activities*

Priority action areas	Proposed priority activities	Priority (Very high, high, medium, low)	Implementation timeline (years)
Pillar I: Data, analysis, and dissemination			
Establish a reliable unified and harmonized blue economy database covering marine and coastal areas	Create and federate a comprehensive and reliable database on marine and coastal information, focusing on the collection of accurate, reliable, and updated data	Very high	2023–2026
Develop a Blue Economy Geoportal: an integrated and multisectoral information system on the blue economy	Prepare an initial prototype of the Blue Economy Geoportal needed for its development, to materialize its design, and to ensure its functionality, stability, and regular update schedule	High	2023–2026
Improve on-the-ground knowledge and leverage geospatial data and technologies for monitoring and assessing blue carbon	Use geospatial data and technologies to monitor and evaluate the natural carbon sequestration deposits in marine and coastal ecosystems, focusing on seagrass meadows and wetlands. Estimate how much soil carbon has been emitted from the loss of meadow ecosystems	Low	2023–2026
Pillar II: Strategic, institutional, and budgetary reforms			
Improve interinstitutional coordination	Establish an interinstitutional coordination mechanism	Very high	2023–2025
	Strengthen skills and provide appropriate training to ensure the effectiveness of the interinstitutional coordination mechanism	Very high	2023–2026
	Develop and use a monitoring and evaluation system for the implementation of the roadmap	Very high	2024–2026
Improve the efficiency and sustainability of public expenditures related to the blue economy	Prepare public budgets "sensitive to the blue economy" for detailed and transparent analysis of sustainability and efficiency of related public spending	High	2023–2026
	Analyze and steer investment programs and public expenditures towards the blue economy and ecological transition	High	2023–2025
	Enhance adaptation and harmonization of key state-owned enterprises and government agencies' role in the blue economy	High	2023–2026
	Establish a "Blue Economy Investment Fund" through public-private partnerships for strategic investments in related projects	High	2024–2028
	Conduct a feasibility study for effective and equitable fiscal instruments to promote the blue economy, considering existing environmental activities	High	2024–2026
Pillar III: Fostering investment			
Key sectors of the blue economy			
Develop sustainable coastal tourism resilient to the effects of climate change and move towards integrated management of sustainable blue destinations adapted to the challenges and risks of climate change	Develop and establish guidelines for the development of sustainable coastal tourism	High	2023–2028
	Structure and deploy multistakeholder pilot projects ("demonstration experiences") for ecological and energy transition in the tourism sector	Very high	2023–2026
	Develop thematic ecotourism offerings for biodiversity preservation and carbon footprint reduction	Very high	2023–2026
	Develop training and support stakeholders in implementing good tourism practices	Moderate	2023–2025
	Identify and promote "Sustainable Tourism Champions" in Tunisia	Moderate	2023–2025
Develop a sustainable and climate-resilient fishing and aquaculture sector	Establish and implement an information collection protocol involving fishers, including a list of indicators, scientific observer assistance on fishing boats, and a standardized data recording system with regular updates	High	2024–2028
	Map and assess key commercial stocks using sustainability indicators to inform decision-making in fisheries	Very high	2024–2028
	Update and complete management plans for key fisheries species and areas through more participative and sustainable management based on current stock information and future projections, considering vulnerability factors	High	2024–2028
	Encourage the inclusion of fishers in the sustainable management of fisheries resources through co-management and participative management models, in line with integrated coastal zone management goals and promoting ecosystem-based fisheries approaches	Moderate	2024–2028
	Develop and implement an integrated monitoring and control plan for fishing activities to achieve predefined objectives while contributing to biodiversity recovery	Very high	2024–2028
	Strengthen the implementation of the National Action Plan for the Eradication of "kiss trawling" and the legal framework supporting it	Very high	2024–2028
	Reform the national legislative framework on fishing, particularly Law No. 94-13 regarding the exercise of fishing	High	2024

Table 4: Summary of roadmap priority action areas and related proposed activities (continued)

Priority action areas	Proposed priority activities	Priority (Very high, high, medium, low)	Implementation timeline (years)
Key sectors of the blue economy			
Develop a sustainable and climate-resilient fishing and aquaculture sector	Establish aquaculture allocated zones within the marine spatial planning framework, minimizing environmental and socio-economic impacts and negative interactions with other uses	High	2024–2026
	Develop an integrated program to improve fry mortality management in aquaculture and optimize fish and aquaculture product purification and conservation processes, enhancing ecological and energy efficiency for better productivity	High	2025–2028
	Stimulate the growth of the local blue economy by launching initiatives that value maritime professions and create sustainable employment and entrepreneurship opportunities, especially for youth, women, and small producers, in alignment with other existing cooperation initiatives	Moderate	2025–2028
Promote the economic, environmental, and social sustainability of maritime transport and ports across the entire value chain and strengthen the sector's adaptation and resilience capacities to the effects of climate change	Support the renewal of the maritime fleet to reduce greenhouse gas emissions in compliance with Annex VI of MARPOL	Very high	2024–2025
	Modernize the regulatory framework for port concessions to facilitate and simplify procedures, making them more effective	Very high	2024–2025
	Establish low-carbon refueling infrastructure for electric renewables when possible, and liquefied natural gas refueling in maritime ports and ballast stations	Very high	2024–2025
	Enhance the control and surveillance of safety rules and environmental standards in the maritime sector	High	2024–2025
	Support research and innovation in maritime economy including a dedicated position for research and innovation within the Office of Merchant Marine and Ports, specializing in the maritime sector's blue economy	Low	2026–2027
Protection of the environment and the fight against climate change			
Preserve marine and coastal assets through the conservation of marine and coastal areas and their biodiversity	Develop and implement robust and adaptive management plans, prioritizing the evaluation of their effectiveness	High	2023–2026
	Map and update ecologically sensitive zones, including *Posidonia* seagrass meadows and other marine grasslands, for integration into the Blue Economy Geoportal	Moderate	2025–2027
Prevent and reduce marine and coastal pollution of all kinds, particularly from plastics	Establish a sustainable mechanism to implement and monitor the progress of the Plastic-Free Coastlines strategy and its action plan	Very high	2024
	Execute the Plastic-Free Coastlines action plan, focusing on highly prioritized projects	High	2024–2026
Develop the resilience of marine and coastal resources to climate change and the effects of coastal erosion and exploit the potential of blue carbon	Implement ecological restoration and climate change adaptation projects in vulnerable coastal and marine areas, using the integrated coastal zone management and marine spatial planning approach, community participation, and nature-based solutions	High	2025–2027

4

Financing the Blue Economy

The current government budget allocated to the blue economy

Budget plays a pivotal role in financing sectors that are central to the development of the blue economy in Tunisia. The government is grappling with multiple pressures in the current fiscal landscape, and the 2023 budget report reflects this challenge. While the Budget Report acknowledges the importance of sectors integral to the blue economy, it does not explicitly identify actions, budgets, or funding channels targeted towards the coastal and marine natural capital development.

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The 2023 National Budget[79] earmarks about 7 percent of its estimated allocation for special missions to primary sectors that could be related to the blue economy, including agriculture, water resources, maritime fishing, tourism, transport, and environment. Based on available information, this means that a mere 0.45 percent of the total budget for these special missions can be directly associated with the blue economy.

Diving deeper into specific sectors reveals that:

- The **maritime and port program**, which oversees eight maritime ports and 41 fishing ports, received TD 23 million (US$7.4 million) in 2020 (2.67 percent of the TD 861 million [US$278.3 million] allocated to the transport sector).
- In 2023, the budget mentions a TD 30 million (US$9.7 million) allocation for the acquisition and upkeep of ships (still less than 3 percent of the transport budget).
- Despite its contribution to the GDP, **the tourism sector** had a very small allocation of the 2021 budget (TD 0.16 million [US$52,000]).
- The **maritime fisheries and aquaculture program** saw an increased allocation in 2021, with a notable portion of this budget aimed at fuel subsidies and port developments.
- The **Environment Mission**, pivotal for the blue economy, directs about 4.1 percent of its budget to programs concerning the prevention of coastal and marine pollution. However, the specifics of these programs are not detailed.

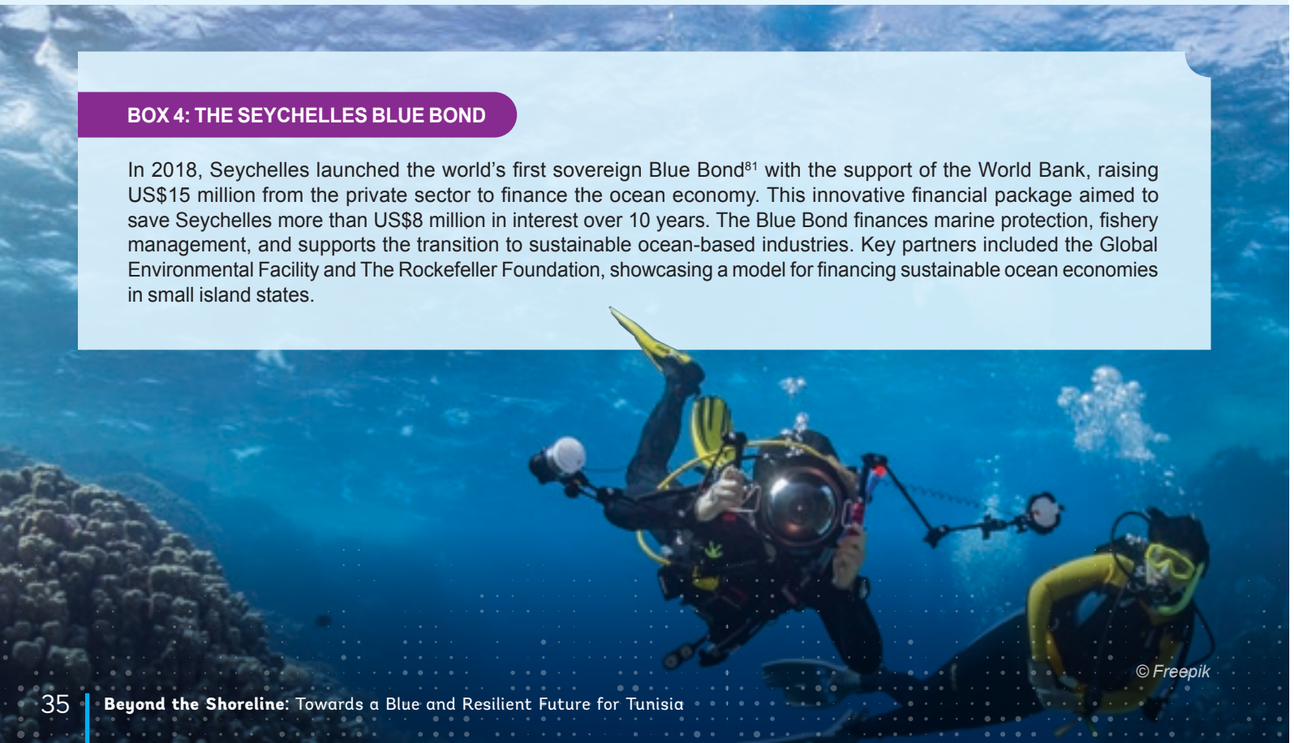
The need for innovative finance and private sector funding

While the Tunisian government's budgetary allocations demonstrate an intention to support the blue economy, public funding alone is clearly insufficient to achieve this goal. This situation underscores the importance of inviting **private sector** investments to complement the public sector's effort, offering both financial depth and innovative approaches to harness the full potential of the blue economy. To foster private sector investment in the blue economy, it is imperative to adopt a multifaceted investment strategy.[80] This involves reallocating Tunisian public funds while simultaneously enhancing access to international concessional and catalytic financing avenues aimed at both developmental goals and climate change mitigation and adaptation. It also involves developing public-private partnerships and mobilizing international philanthropic funds with mandates to invest in blue economy initiatives.

The private sector plays an important role in financing blue economy sectors such as tourism, fisheries and aquaculture, and marine transport. In tourism, private investments typically focus on enhancing eco-resorts and sustainable practices that protect coastal ecosystems. In fisheries and aquaculture, private funds are being directed towards sustainable fishing practices and innovative aquaculture technologies. Similarly, in marine transport, private investments focus on green shipping initiatives and infrastructure that reduces environmental impact.

BOX 4: THE SEYCHELLES BLUE BOND

In 2018, Seychelles launched the world's first sovereign Blue Bond[81] with the support of the World Bank, raising US$15 million from the private sector to finance the ocean economy. This innovative financial package aimed to save Seychelles more than US$8 million in interest over 10 years. The Blue Bond finances marine protection, fishery management, and supports the transition to sustainable ocean-based industries. Key partners included the Global Environmental Facility and The Rockefeller Foundation, showcasing a model for financing sustainable ocean economies in small island states.



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Innovative instruments such blue bonds and nature debt swaps could be potential game-changers for Tunisia in financing its blue economy. Blue Bonds are essentially debt instruments—whether issued by governments, such as the Seychelles (Box 4) or private entities—that aim to finance projects that endorse the sustainable use and preservation of marine and coastal resources. Nature debt swaps follow a cutting-edge financial model that enhances nature conservation through debt repayment schemes. Nations or entities experiencing debt sustainability challenges can choose to redirect a fraction of their debt towards investments or actions dedicated to environmental conservation and the blue economy. An example is PORTUGAL BLUE,[82] a €50 million (US$54.7 million) collaboration to buttress Portuguese enterprises in the blue economy. PORTUGAL BLUE seeks to address the financing challenges encountered by small and medium enterprises (SMEs) in the blue economy by introducing guarantees to financial intermediaries, effectively attenuating perceived lending risks. Tunisia could reap the benefits of international investment by harnessing such mechanisms, as long as it does so with a nuanced grasp of their associated risks and rewards.

Tunisia's recent reforms to bolster innovative SMEs[83] can also be leveraged to finance the blue economy. A cornerstone to achieve this are the incubation and entrepreneurship programs that can include innovative companies active in the blue economy space.

Fiscal incentives[84] such as tax credits and blue economy-centric tax reductions included in the reform package, could be steered toward developing the blue economy. Tunisia already has a series of fiscal incentives aimed at environmental conservation in place. For instance, taxes channeled towards the Environmental Protection and Aesthetics Fund predominantly target city protection endeavors such as cleaning, fighting pollution, improving aesthetics, and raising environmental awareness. Additionally, Article 37 of Tunisia's Investment Incentive Code provides various incentives for firms that invest to mitigate pollution from their operations, or that specialize in waste collection, transformation, and treatment. These incentives are not currently exclusively tailored for blue economy initiatives and focus on broader environmental concerns. Another potential financing catalyst could be a lower value added tax (VAT) rate for blue economy products. By applying reduced VAT rates to eco-conscious products and services, such as sustainable seafood products and ecotourism, the government could bolster their uptake.

Corporate social responsibility practices and climate risk disclosure could further encourage private sector investment in the blue economy. Commitment to environmental stewardship and transparency may enhance the credibility of Tunisian private sector organizations and improve investor confidence, opening avenues for the use of specialized green and blue financing instruments tailored for environmentally beneficial projects. A focus on corporate social responsibility could spur innovation and operational efficiency, leading to new business opportunities in the blue economy.

The International Finance Corporation (IFC)[85] has initiated an Environmental, Social, and Governance (ESG) program in Tunisia, aiming to foster sustainable business growth and attract private sector investment. Launched in partnership with the Swiss State Secretariat for Economic Affairs, the program emphasizes the adoption of ESG best practices across Tunisia's financial, manufacturing, and agribusiness sectors. It also aims to enhance the capacity of regulatory bodies, including the Central Bank of Tunisia and the Tunis Stock Exchange, to integrate, monitor, and enforce ESG standards. It serves as a testament to the pivotal role that responsible corporate practices and climate risk transparency play in attracting investments and fostering sustainable growth, particularly in crucial sectors of the blue economy.

Local financial institutions are already embracing such innovative finance practices. Banque Zitouna's partnership with Soul & Planet[86] is an example of a local, private sector-led initiative promoting responsible corporate governance and climate risk disclosure. It emphasizes the financing of sustainable development and has led to impactful measures aimed at combating climate change, including significant water usage optimization and employee climate awareness programs. These measures—part of Banque Zitouna's broader strategy to ensure operational efficiency and environmental stewardship—demonstrate how corporate social responsibility and clear climate action can catalyze the financing and growth of the blue economy.

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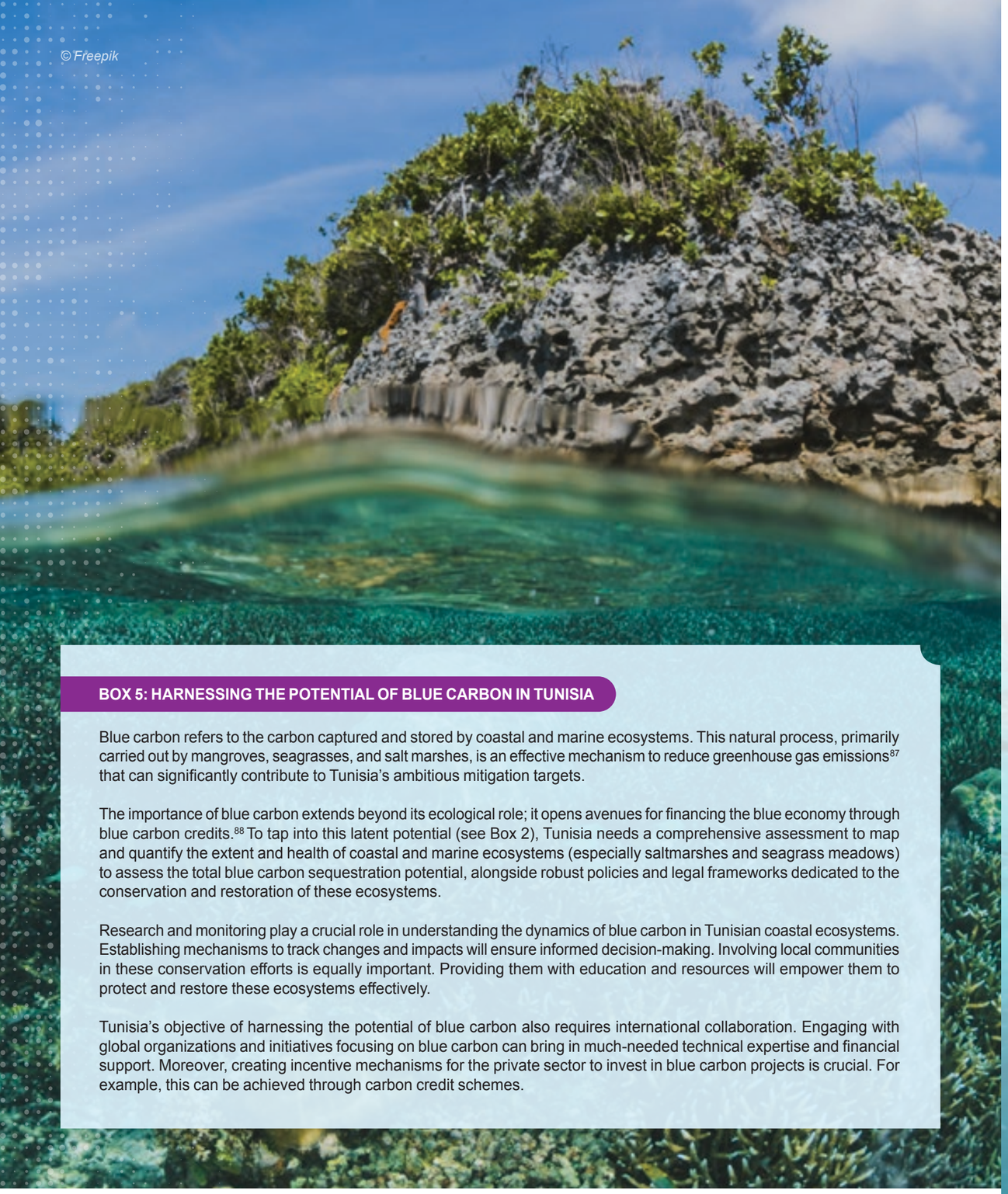

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BOX 5: HARNESSING THE POTENTIAL OF BLUE CARBON IN TUNISIA

Blue carbon refers to the carbon captured and stored by coastal and marine ecosystems. This natural process, primarily carried out by mangroves, seagrasses, and salt marshes, is an effective mechanism to reduce greenhouse gas emissions[87] that can significantly contribute to Tunisia's ambitious mitigation targets.

The importance of blue carbon extends beyond its ecological role; it opens avenues for financing the blue economy through blue carbon credits.[88] To tap into this latent potential (see Box 2), Tunisia needs a comprehensive assessment to map and quantify the extent and health of coastal and marine ecosystems (especially saltmarshes and seagrass meadows) to assess the total blue carbon sequestration potential, alongside robust policies and legal frameworks dedicated to the conservation and restoration of these ecosystems.

Research and monitoring play a crucial role in understanding the dynamics of blue carbon in Tunisian coastal ecosystems. Establishing mechanisms to track changes and impacts will ensure informed decision-making. Involving local communities in these conservation efforts is equally important. Providing them with education and resources will empower them to protect and restore these ecosystems effectively.

Tunisia's objective of harnessing the potential of blue carbon also requires international collaboration. Engaging with global organizations and initiatives focusing on blue carbon can bring in much-needed technical expertise and financial support. Moreover, creating incentive mechanisms for the private sector to invest in blue carbon projects is crucial. For example, this can be achieved through carbon credit schemes.

The design and execution of financing mechanisms should build on existing sector-specific best practices, clearly outline project parameters and goals, and conduct exhaustive financial viability and risk assessments. To harness the full spectrum of the blue economy financing potential in Tunisia, it is essential to continue aligning incentives by forging robust financing frameworks with the active collaboration of both public and private stakeholders, while improving training and knowledge within the sectors, and staying attuned to international financing trends and prospects.

Conclusion

The roadmap for Tunisia's blue economy presents an opportunity for Tunisia to harness the potential of the blue economy as a catalyst for resilient economic growth, environmental sustainability, and social inclusivity. The roadmap highlights key challenges—including environmental degradation, climate change impact, governance complexities—and fiscal constraints. It further presents several strategic priority action areas and related priority activities across three pillars to address these challenges and transition towards a sustainable and resilient blue economy.

The roadmap's **first pillar** (data, analysis, and dissemination) emphasizes the importance of a robust data infrastructure that facilitates informed decision-making and transparent management of marine resources. The development of an integrated geoportal and a comprehensive database would mark a significant step towards achieving this goal. It also emphasizes the need to improve knowledge by leveraging new technologies.

The **second pillar** (policy, institutional, and fiscal reforms) focuses on the critical need for institutional and fiscal reforms. It underscores the necessity of a strong coordination mechanism, streamlined governance structures, and a thorough public expenditure review. These reforms are pivotal to ensuring the efficiency, effectiveness, and sustainability of the blue economy initiatives.

The **third pillar** (fostering investment) identifies specific policy interventions and incentives that will enable investment in, and the growth of, key sectors such as coastal tourism, fisheries, aquaculture, and maritime transport while protecting and restoring the coastal and marine natural capital through ICZM approaches, community participation, and nature-based solutions. It calls for innovative financing mechanisms, private sector engagement, and adoption of sustainable practices.

The roadmap highlights the critical role of both public and private investments, advocating for a synergistic approach that leverages innovative financing models and underscores the importance of fiscal incentives and corporate social responsibility in attracting sustainable investments.

The roadmap serves as both a call to action and a guide, outlining the pathways Tunisia could navigate to address the current challenges, leverage its unique marine and coastal assets, and realize the full potential of its blue economy.

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