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ANNEX

# Blue Economy and Blue Biotechnologies in Albania

Analyses and Recommendations on Blue  
Economy and Blue Biotechnologies in  
Albania

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## Abbreviations

Acronym	
ABS	Access and Benefit-Sharing
GFCM	General Fisheries Commission for the Mediterranean
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Points
IMTA	Integrated Multi-Trophic Aquaculture
IP	Intellectual Property
ISO	International Organization for Standardization
MPA	Marine Protected Area
MSP	Marine Spatial Planning
PES	Payment for Ecosystem Services
PHAs	Polyhydroxyalkanoates
RDI	Research, Development & Innovation
SME/MSME	(Micro) Small and Medium-sized Enterprise
VMS/AIS	Vessel Monitoring System / Automatic Identification System
BBt	Blue Biotechnology
DS	Demonstration Sites
BHHs	Blue Biotechnology Hubs
MedIA	Mediterranean Innovation Alliance for Sustainable Blue Bioeconomy



## Executive summary

Albania's blue economy and emerging blue biotechnology (BlueBio) sector represent a strategic opportunity to combine sustainable growth, innovation, and EU integration. With over 450 km of coastline, rich biodiversity, and alignment with the EU Blue Growth Strategy and Western Balkans Green Agenda, Albania is well positioned to diversify its economy through sustainable use of marine resources.

The baseline assessment confirms that traditional blue economy sectors—fisheries, aquaculture, coastal tourism, and maritime transport—remain the backbone of coastal livelihoods and exports. At the same time, new value chains such as marine renewables, ecosystem services, and BlueBio applications are showing increasing potential. Albania's biodiversity hotspots, coupled with growing research capacity, create strong prospects for developing algae-based bio-products, fishery side-stream biorefineries, marine-derived pharmaceuticals, nutraceuticals, and bio-materials. Pilot actions, including the Vlorë algae and IMTA initiative, highlight the feasibility of scaling innovative models for aquaculture and biotechnology. Similarly, the feasibility study on BlueBio start-ups indicates a medium-to-high potential, provided that infrastructure, financing mechanisms, regulatory frameworks, and skills development are improved. Lessons from neighbouring countries (Greece, Italy, Montenegro, Croatia) provide tested models for incubation programs, accelerators, and academia–industry partnerships that Albania can adapt. However, the sector faces persistent challenges: fragmented data, infrastructure bottlenecks, financing constraints, and limited technical expertise, alongside external threats such as climate impacts, overfishing, and bureaucratic delays. Addressing these will require reforms and investments in enabling environments, policy coherence, and capacity-building.

The report sets out a strategic roadmap for 2025–2030, including:

1. Establishing a National BlueBio Program and demonstration hubs;
2. Upgrading coastal infrastructure and quality systems (hatcheries, labs, cold-chain, pilot plants);
3. Developing incubation and financing mechanisms to support start-ups and SMEs;
4. Strengthening academia–industry linkages and skills development;
5. Promoting sustainability safeguards through marine spatial planning and nature-based solutions; and
6. Enhancing market positioning via branding, certification, and participation in EU networks.

If these measures are implemented, Albania could achieve:

1. Diversified and resilient coastal economies;
2. Over 15,000 new jobs in blue sectors within the next decade;
3. Increased exports of certified seafood and BlueBio products;
4. Strengthened biodiversity protection and climate resilience; and



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#### 5. Deeper alignment with EU accession and regional cooperation.

In conclusion, Albania stands at a critical juncture: by leveraging natural capital and EU integration pathways, while addressing institutional and capacity gaps, the country can become a regional hub for sustainable blue economy and biotechnology innovation.



# 1. Context and Key Concepts

## 1.1 The Blue Economy in Albania

Albania, with its strategic location along the Adriatic and Ionian Seas and a coastline of more than 450 km, is endowed with diverse marine and coastal ecosystems that provide significant opportunities for sustainable economic growth. The concept of the blue economy—the sustainable use of ocean and coastal resources for economic development, improved livelihoods, and ecosystem health—has gained increasing importance in Albania over the past decade.

### 1.1.1 Strategic Context

The blue economy is recognized as a priority within Albania's integration process into the European Union and aligns with the **EU Blue Growth Strategy** and the **Western Balkans regional initiatives**. National development strategies emphasize the role of fisheries, aquaculture, tourism, renewable energy, and maritime transport as key sectors contributing to growth and employment. However, the sector remains underdeveloped compared to its potential, with challenges related to governance, infrastructure, and sustainability.

### 1.1.2 Strategic Context

- **Fisheries and Aquaculture:** Albania has a strong tradition in capture fisheries, especially in the Adriatic, while aquaculture—particularly marine aquaculture—remains in an early stage of development. Opportunities exist in diversifying species, improving value chains, and promoting environmentally friendly practices.
- **Tourism and Coastal Development:** The Albanian Riviera and marine protected areas such as Karaburun-Sazan and Porto Palermo are increasingly popular destinations. Eco-tourism, diving, and maritime cultural heritage can be further developed as part of a sustainable blue economy model.
- **Maritime Transport and Ports:** Albania's ports, notably in Durrës and Vlora, are critical gateways for trade. Modernization and integration into regional transport corridors can enhance their role in the blue economy.
- **Renewable Energy:** The country has untapped potential for offshore wind and solar energy projects, which could diversify Albania's predominantly hydropower-based energy system.



- **Innovation and Circular Economy:** Emerging opportunities exist in valorizing by-products from fisheries and aquaculture, promoting marine biotechnology, and developing small-scale blue enterprises.

### 1.1.3 Environmental and Governance Considerations

Albania's marine and coastal resources face increasing pressures from overfishing, pollution, unregulated coastal development, and climate change. Effective governance, monitoring, and enforcement remain critical challenges. Efforts such as the designation of marine protected areas, alignment with EU directives, and regional cooperation under the Barcelona Convention provide important frameworks for integrating environmental sustainability into the blue economy.

### 1.1.4 Outlook

The blue economy represents a major development opportunity for Albania, offering pathways to sustainable growth, job creation, and regional cooperation. Unlocking this potential requires targeted investments in innovation, infrastructure, and human capacity, combined with strong environmental safeguards and multi-stakeholder partnerships. In this context, initiatives such as the **2B-Blue project** can play a vital role in fostering sustainable and innovative blue businesses, supporting Albania's transition towards a resilient and inclusive blue economy.

## 1.2 The Blue Biotechnologies in Albania

Blue biotechnology—the application of marine and aquatic organisms for products and processes in health, food, energy, and environmental management—is an emerging field in Albania with significant untapped potential. While still at an early stage of development, Albania's diverse marine and freshwater resources, combined with its growing research capacity and EU integration process, provide opportunities to position blue biotechnologies as a driver of sustainable innovation within the broader blue economy.

### 1.2.1 Strategic Context

At the European level, blue biotechnologies are recognized as a **key enabling sector of the EU Blue Growth Strategy**, with applications ranging from pharmaceuticals and nutraceuticals to bio-based materials, cosmetics, and environmental solutions. In Albania, although the sector is not yet explicitly defined in national strategies, related fields such as aquaculture, fisheries, and environmental protection create an enabling foundation. Albania's alignment with EU research frameworks (e.g., Horizon Europe) and its participation in Mediterranean cooperation initiatives offer opportunities for knowledge transfer



and capacity building.

## 1.2.2 Strategic Context

- **Marine Biodiversity:** Albania's coastal and marine ecosystems, including seagrass meadows, coralligenous habitats, and rich fish and invertebrate populations, represent a potential source of bioactive compounds for pharmaceuticals, nutraceuticals, and cosmetics.
- **Aquaculture and Fisheries By-Products:** Waste streams from capture fisheries and aquaculture—such as fish skins, shells, and viscera—could be valorized into high-value products like collagen, chitosan, and omega-3 extracts.
- **Algae and Seaweed Resources:** Although underexplored, Albania's coastal waters have favorable conditions for cultivating microalgae and macroalgae, which can be used for biofuels, feed, and biofertilizers.
- **Marine Biotechnology for Environmental Services:** Potential applications include bioremediation of polluted waters and development of biosensors for monitoring ecosystem health.

## 1.2.3 Current Landscape

Research in blue biotechnologies in Albania remains limited and fragmented. Academic institutions and research centers have initiated studies on marine biology, aquaculture, and environmental monitoring, but dedicated laboratories and industrial applications are still lacking. Collaboration with international partners has been crucial in accessing advanced methodologies and technologies. The private sector has not yet significantly invested in this field, but there is growing interest in innovation linked to aquaculture, marine-derived food supplements, and eco-friendly materials.

## 1.2.4 Challenges and Opportunities

The development of blue biotechnologies in Albania faces several constraints: limited infrastructure and research capacity, lack of a dedicated policy framework, low awareness among policymakers and entrepreneurs, and insufficient investment. However, opportunities exist to build on Albania's biodiversity richness, engage in regional and EU-funded projects, and foster partnerships between science, industry, and civil society. Pilot initiatives—such as valorization of by-products from fisheries or experimental pearl culture—illustrate the potential for innovative blue biotechnology applications.



## 1.2.5 Outlook

Blue biotechnologies can become a niche area for Albania within the Mediterranean, contributing to sustainable economic diversification, environmental protection, and regional competitiveness. With targeted investments in research infrastructure, training, and entrepreneurship support, Albania could develop a small but dynamic blue biotechnology sector. Projects such as **2B-Blue** offer a timely platform to explore and promote innovative blue biotech solutions, aligning Albania with European priorities and unlocking new pathways for sustainable development.



## 2. Baseline Assessment on the Blue Economy and Blue Biotechnologies Potential of Albanian Coastal Areas

### Summary

This baseline assessment provides an integrated overview of Albania's blue economy and the emerging potential of blue biotechnologies across the country's coastal and marine areas, from the northern Adriatic (Shëngjin) to the southern Ionian (Sarandë). It summarizes sectoral status, resource endowments, institutional capacity, regulatory context, infrastructure, market opportunities, sustainability risks, and a prioritized roadmap for action. The analysis is intended to support evidence-based planning by government agencies, municipalities, academia, civil society, and private investors engaged in sustainable coastal development.

Key findings indicate that traditional blue economy pillars—coastal tourism, fisheries, aquaculture, and maritime transport—continue to anchor local livelihoods and exports, while new value chains—marine renewables, ecosystem services, and nature-based solutions—are nascent but promising. Blue biotechnology (BlueBio) opportunities are strongest where biodiversity, research capability, and supply-chain readiness overlap: notably micro- and macroalgae valorization (nutraceuticals, cosmeceuticals, biofertilizers), marine invertebrate bioactives (e.g., sponges, tunicates, mollusks), fish-processing by-product biorefineries (collagen, chondroitin, fish oils), and marine microbial resources (enzymes, bioplastics precursors).

To unlock this potential, Albania should prioritize: (i) establishing a national BlueBio program aligned with EU missions and the Western Balkans Green Agenda; (ii) improving data, quality standards, and biosafety/bioprospecting protocols; (iii) upgrading coastal logistics (cold chain, water quality labs, hatcheries, pilot-scale bioprocessing); (iv) incentivizing innovation–industry linkages and start-up incubation; and (v) protecting natural capital through marine spatial planning (MSP), marine protected area (MPA) management, and climate adaptation measures.

### 2.1 Context and Scope

Albania's coastline along the Adriatic and Ionian Seas hosts ecologically diverse habitats—lagoons, Blue Economy and Blue Biotechnologies in Albania



estuaries, seagrass meadows, rocky shores, and submarine canyons—supporting fisheries, aquaculture, tourism, and port activities (Shëngjin, Durrës, Vlorë, Sarandë) (Figure 1). EU integration pathways, alignment with the EU Blue Economy framework, and Mediterranean regional initiatives (e.g., UNEP/MAP, GFCM, WestMED) create an enabling policy backdrop. This assessment maps assets and gaps to inform program design, investment prioritization, and monitoring.



Figure 1. Map of Albania and its Exclusive Economic Zone, as represented in the WB 2020 report: Source: World Bank. 2020. Realizing the Blue Economy Potential of Albania © World Bank.

## 2.2 Methodological approach

The baseline applies a mixed-methods approach: (a) desk review of official strategies, statistical yearbooks, and sector reports; (b) value-chain mapping for priority blue economy segments; (c) rapid capacity assessment of research and innovation (R&I) actors; (d) environmental risk screening using a



natural capital lens; and (e) a SWOT and problem-tree synthesis. Indicators are organized by inputs (infrastructure, funding), outputs (production volumes, patents, pilots), outcomes (jobs, exports, diversification), and impacts (ecosystem status, resilience).

## 2.3 Geographic and ecological overview of the coast

The northern Adriatic coast (Lezhë/Shëngjin) features sandy shores, lagoons, and riverine deltas (Drin, Mat) that support small-scale fisheries and potential shellfish farming. Central coast hubs around Durrës and Vlorë concentrate ports, logistics, and ship services with adjacent tourism and processing facilities. The southern Ionian (Himarë–Sarandë) is dominated by rocky coves, high water clarity, and seagrass habitats, suiting dive tourism, mariculture in sheltered bays, and bioprospecting for marine natural products. The Karaburun–Sazan Marine National Park and Porto Palermo Bay MPA underpin biodiversity and ecotourism potential.

## 2.4 Socioeconomic snapshot of the Blue Economy

Employment is concentrated in coastal tourism, small-scale fisheries, maritime services, and construction linked to waterfront development. MSMEs dominate, with seasonal fluctuations in labor demand. Export earnings arise from fisheries/aquaculture products, fishmeal/oil, and transport services. Skills gaps are reported in aquaculture hatchery operations, quality assurance (HACCP, ISO), cold-chain management, and bioprocess engineering—areas that education and vocational programs can target.

## 2.5 Sectoral Baselines

### 2.5.1 Marine Fisheries

Commercial marine fisheries in Albanian waters encompass trawling, purse-seining of small pelagics, and small-scale gears targeting demersal species (for example, hake, mullet, cephalopods). According to national data and sectoral overviews, the Albanian marine fisheries sector continues to face a declining trend in production, reflecting both resource pressures and structural constraints (FAO, 2023).

Key constraints include:

- **Stock status uncertainty:** The majority of commercial stocks in the Adriatic and Ionian Sea are considered subject to over-exploitation or at least high fishing pressure, including species such as European anchovy (*Engraulis encrasicolus*), European hake (*Merluccius merluccius*) and red mullet (*Mullus barbatus*) (Firend of the Sea, 2015).
- **Fuel and operational costs:** As in many Mediterranean fleets, increased fuel prices and vessel maintenance raise the cost-base of fishing activity. For example, in the first half of 2022 Albania's



marine fishing saw reduced activity attributed to elevated fuel costs (Eurofish 2023).

- **Adoption of selective gears and by-catch reduction:** There is limited uptake of selectivity devices that reduce by-catch of non-target species (including sharks and rays), vulnerable marine ecosystems and endangered species. The national biodiversity assessment highlights by-catch of sharks and marine turtles in the marine fishery as a pressure (SPA/RAC 2022).
- **Landing infrastructure and market access:** Infrastructure such as modern fish-landing sites, cold-chain logistics and organised auction or wholesale orientation remain underdeveloped. Upgrades in landing infrastructure and traceability are identified as priorities for market access (Eurofish 2023).

Opportunities for improving sustainability and market access include:

- **Upgraded data collection and monitoring:** Introduction of electronic logbooks, vessel monitoring systems (VMS) or AIS (Automatic Identification System)-based tracking, and improved control-surveillance-monitoring (MCS) systems. For instance, Albania is implementing measures under the General Fisheries Commission for the Mediterranean (GFCM) framework including a shared Fisheries Restricted Area (FRA) in the South Adriatic (with Italy) to protect vulnerable habitats and essential fish habitats (EU, 2024).
- **Selectivity devices and by-catch mitigation:** Implementation of by-catch reduction devices, modifications in trawl designs or demersal gears to reduce unwanted catches of sharks, rays, and other vulnerable fauna.
- **Improved harbour hygiene and post-harvest handling:** Adoption of cold-chain infrastructure, hygienic landing sites and facilities for export oriented products would support value addition and access to stricter markets (EU, MSC certification etc.). The national seafood industry overview identifies certification (e.g., via Friend of the Sea) as a path for improvement (Friend of the Sea, 2015).

In summary, the marine fisheries baseline reflects both an urgent need for resource assessment and governance improvements, as well as technological and infrastructure opportunities that can support the transition to a more sustainable and market-oriented sector.

## 2.5.2 Brackish and Marine Aquaculture

In Albania, aquaculture in brackish lagoons and coastal farms is oriented primarily toward species such as European seabass (*Dicentrarchus labrax*), gilthead seabream (*Sparus aurata*) and mussels (notably *Mytilus galloprovincialis*). There is also growing pilot interest in oysters and macroalgae cultivation. National statistics indicate that marine aquaculture production remains modest, and growth is constrained (FAO, 2023)

Key bottlenecks include:

- **Broodstock and fry supply:** The supply chain for quality broodstock and fry for marine finfish and shellfish is under-developed, reducing the ability to scale production and maintain



consistent yields.

- **Site licensing and regulatory bottlenecks:** Coastal lease/licence frameworks, environmental authorisations and zoning constraints slow down farm establishment. The national biodiversity baseline points to a need for improved spatial planning for marine aquaculture and coordination with MPAs (SPA/RAC 2022).
- **Biosecurity and water-quality monitoring:** Farms, especially in lagoons and nearshore, face risks from water pollution, eutrophication and physical hazards. Monitoring systems are often limited.
- **Technology and infrastructure:** Capital costs for modern systems (e.g., recirculating aquaculture systems – RAS) are high and require technical capacity.

Opportunities include:

- **Integrated Multi-Trophic Aquaculture (IMTA):** IMTA systems – co-cultivating fed species (e.g., finfish) with extractive species (e.g., shellfish, seaweeds) – offer environmental and economic benefits. According to global reviews, IMTA can enhance nutrient recycling, reduce environmental loads, diversify products and increase profitability (Khanjani et al., 2022). In the Albanian and Mediterranean context, IMTA is explicitly cited as an opportunity for aquaculture intensification while improving ecological performance (climatefactchecks.org, 2015)
- **Recirculating Aquaculture Systems (RAS) near ports/logistics hubs:** Near-port RAS systems may reduce transportation costs, improve biosecurity and enable controlled production of high-value species.
- **Valorization of processing by-products:** By-products from aquaculture (e.g., skin, shell, waste streams) can be valorised into collagen, gelatin, biofertilizers or feed ingredients, supporting circular economy approaches. This aligns with broader bio-economy trends in Mediterranean aquaculture (cpmr-intermed.org, 2025)
- **Alignment with certification and traceability:** Accelerating certification schemes (e.g., Friend of the Sea) can enhance market access for value-added aquaculture products. Friend of the Sea, 2015).

Therefore, the aquaculture baseline reflects a sector with growth potential but requiring technical upgrading, better regulatory enabling conditions and value-chain innovation to move from niche to scale.

### 2.5.3 Coastal and Maritime Tourism

The tourism sector remains a principal driver of the blue economy in Albania, with segments such as beach tourism (sun and sand), cultural heritage experiences, gastronomy, diving, sailing and yacht tourism. According to recent analyses, Albania's coastal and marine resources represent a major asset for growth of the blue economy (WB 2020).

Pressures on the sector include:



- **Seasonality:** The predominant summer-peak model limits employment and service opportunities during shoulder and off-seasons.
- **Coastal erosion and climate change impacts:** Rising sea levels, increased storm frequency and coastal infrastructure pressure (e.g., beach protection works) pose risks to beach assets and associated tourism infrastructure. The national biodiversity baseline flags coastal development and climate change effects as key pressures (SPA/RAC 2022).
- **Wastewater loads and informal development:** Rapid and informal development of coastal housing and tourism facilities often lacks wastewater treatment and adequate infrastructure, leading to pollution of coastal waters and degradation of natural assets.
- **Limited diversification of product offering:** Many tourism offers focus on the traditional sun-sea-sand model, with less emphasis on year-round or specialised tourism (eco-tourism, scuba diving, cultural routes).

Product diversification and value-added opportunities include:

- **Eco-tourism trails and nature-based experiences:** Developing marine protected areas (MPAs) as “living laboratories”, creating marine heritage routes (e.g., maritime heritage, historic ship-wreck diving) and offering community-based tourism can extend seasons and spread benefits to coastal communities.
- **Blue heritage routes and culinary festivals:** Integrating gastronomy (e.g., fish and shellfish from sustainable fisheries/aquaculture), cultural heritage and coastal community experiences can generate distinctive tourism products and offset seasonality.
- **Diving, sailing and marina development:** Upgrading marina infrastructure, yacht services and diving amenities can attract higher-value segments, increase stays and generate higher local expenditure.
- **Linkages with fisheries and aquaculture:** Tourism there can be linked with seafood provenance tours, aquaculture farm visits, and sustainable fishing experiences (catch-and-release, shark avoidance gear demonstrations).

The baseline thus recognises the tourism sector’s double role: as a growth engine and as a sector that must embed sustainability, value-chain diversification and resilience to climate/sea-level change.

## 2.5.4 Ports, Maritime Transport and Ship Services

The major maritime gateways in Albania include Port of Durrës (largest cargo and passenger port), Port of Vlorë, Port of Shëngjin and Port of Sarandë. These serve trade, passenger traffic, cruise tourism, ferry connections and intra-regional routes (CPMR and MedWaves, 2022).

Modernisation priorities and constraints:

- **Green-port initiatives:** Transition to shore power (cold-ironing), advanced waste reception, ballast water and bio-fouling management are increasingly required both by EU regulation and



by shipping markets. These initiatives also support decarbonisation of port operations and reduce local environmental impacts.

- **Maritime safety and logistics efficiency:** Enhancing safety, navigation, dredging of access channels, and capacity for larger vessels are key. In particular, the construction of the new Porto Romano Port near Durrës, planned as a major new seaport with modern logistics, including for Kosovo and North Macedonia trade corridor, is under way and aims to set new environmental and connectivity standards (CPMR and MedWaves, 2022).
- **Cold-chain logistics and back-offices for fisheries/aquaculture exports:** Ports serve as nodes for fisheries and aquaculture exports; thus the presence of cold-storage, refrigeration, rapid onward transport and value-added processing can improve competitiveness of seafood exports.
- **Ship-repair yards, marina services and high-skill jobs:** Development of ship-service industry (repair/refit, maintenance) and marinas for leisure crafts can deliver skilled employment, attract foreign investment and link to coastal tourism. The baseline recognises under-exploitation of this opportunity in the Albanian context (WB, 2021).

Thus the baseline emphasises that ports and maritime transport are both foundational infrastructure and enabling nodes for the broader blue economy; modernisation and alignment with environmental and logistical best-practice are critical.

## 2.5.5 Marine Renewable Energy and Nature-Based Solutions

Although large-scale offshore energy (e.g., major wind farms) remains nascent in Albania, initial site screenings indicate potential for small-scale wave / solar-hybrid pilots in sheltered harbours or coastal zones, as well as nature-based infrastructure such as seagrass and dune restoration, to buffer erosion and sequester blue carbon. For example, restoration of coastal wetlands and similar habitats is addressed by recent national climate change adaptation documentation. (Lecerf et al., 2023)

Key elements and opportunities:

- **Wave and solar-hybrid pilot deployment:** Sheltered coastal zones could host small wave-energy converters or floating solar modules; such pilot installations could test local feasibility, grid interface and environmental interactions.
- **Nature-based infrastructure and blue carbon approaches:** Restoration of seagrass meadows, dune systems and other coastal blue-carbon habitats serve both adaptation (erosion buffer, ecosystem resilience) and mitigation (carbon sequestration) functions. The global “blue carbon” literature emphasises that coastal wetlands (e.g., seagrasses, salt marshes) can sequester much more carbon per unit area than terrestrial systems (Soares et al., 2022).
- **Payments for Ecosystem Services (PES) and carbon credits:** If monitoring, reporting and verification (MRV) systems are established, restoration of blue-carbon habitats and nature-based coastal protection schemes could generate new revenue streams via carbon credit markets or ecosystem-services payments.



- **Screening and spatial planning:** Because offshore renewable and nature-based solutions involve multiple uses (fisheries, aquaculture, tourism, transport), integrated marine spatial planning (MSP) and early stakeholder engagement are required; the Albanian coastal biodiversity baseline notes that marine spatial planning remains an important gap (SPA/RAC, 2022).

In sum, the baseline recognises marine renewable energy and nature-based solutions not yet fully operational but representing strategic growth frontiers for the Albanian blue economy, particularly in combination with adaptation and carbon-finance themes.

## 2.6 Blue Biotechnology resource base

Albania's coasts host exploitable BlueBio resources spanning macroalgae (*Ulva*, *Cystoseira/Trebouxia*-associated communities), microalgae (diatoms, cyanobacteria), invertebrates (Porifera sponges, tunicates, bivalves), fish processing side-streams, and marine microbes from sediments and extreme niches (e.g., submarine springs, caves). Biodiversity hotspots in MPAs and less-disturbed bays create opportunities for ethical bioprospecting under access and benefit-sharing (ABS) principles.

## 2.7 Research, Development & Innovation (RDI) capacity

Universities and research institutes in Tirana, Vlorë, and Shkodër, along with specialized labs (e.g., aquaculture, marine ecology, food technology), provide a base for applied research. Priority capacity needs include: pilot-scale bioprocessing equipment (photobioreactors, fermenters, lyophilizers), advanced analytics (HPLC, LC-MS, GC-MS), biosafety facilities, and IP management support. Regional consortia and EU programs (Horizon Europe, PRIMA, Interreg, COST, BlueMission) can co-fund infrastructure and training.

## 2.8 Priority BlueBio Value Chains

### 2.8.1 Micro- and macroalgae valorization

Applications: nutraceutical ingredients (omega-3s, pigments), animal feed additives, biofertilizers/biostimulants, wastewater bioremediation, and biodegradable materials. Actions: establish a pilot algae cultivation and biorefinery hub near Vlorë with seawater access; develop strain library; standardize quality protocols; and pilot IMTA with bivalves/fish to reduce nutrient loads.



## 2.8.2 Marine invertebrate bioactives

Applications: antimicrobial, anti-fouling, and anti-inflammatory compounds from sponges/tunicates; collagen and chitin/chitosan from shellfish remains. Actions: ethical sampling in MPAs with permits; metabolite screening partnerships with pharma/cosmetics; and side-stream processing units at fish/shellfish processors to generate high-value extracts.

## 2.8.3 Fishery and aquaculture side-stream biorefineries

Applications: collagen, gelatin, minerals (Ca, P), fish oils, peptides, and enzymes from skins, bones, scales, and viscera. Actions: organize a logistics network for cold collection of by-products at landing sites and processing plants; deploy modular extraction units; certify according to food, feed, and cosmetic-grade standards; and link to export distributors.

## 2.8.4 Marine microbial resources

Applications: cold-active enzymes, bioplastics precursors (PHAs), biosurfactants, and bioleaching agents from marine bacteria/archaea. Actions: establish culture collections, implement ABS-compliant sampling, and create joint labs with EU partners to translate discoveries to pilots.

## 2.9 Policy and regulatory landscape

Alignment with EU acquis and Mediterranean conventions shapes fisheries management, aquaculture licensing, water quality, biosafety, and biodiversity protection. For BlueBio, clear access and benefit-sharing (ABS) rules, IPR policies, and streamlined permits for pilot plants are essential. Marine Spatial Planning (MSP) should designate innovation zones for IMTA, algae farms, and test sites while safeguarding sensitive habitats.

## 2.10 Infrastructure, logistics, and quality systems

Priority facilities: hatcheries (seabass/seabream, bivalves, microalgae starters), affordable cold storage near landing sites, water-quality and residue-testing labs accredited to ISO/EN standards, and a pilot BlueBio processing center with GMP/HACCP compliance. Digital traceability (from vessel/farm to market) can differentiate Albanian products on sustainability and provenance.



## 2.11 Human capital, skills, and entrepreneurship

Priority facilities: hatcheries (seabass/seabream, bivalves, microalgae starters), affordable cold storage near landing sites, water-quality and residue-testing labs accredited to ISO/EN standards, and a pilot BlueBio processing center with GMP/HACCP compliance. Digital traceability (from vessel/farm to market) can differentiate Albanian products on sustainability and provenance.

## 2.12 Environmental and climate risk screening

Key pressures include coastal erosion, marine litter, wastewater and agricultural runoff, invasive species, and climate-driven heatwaves and acidification affecting shellfish and seagrass. Risk management options: early-warning systems, selective fishing gears (to reduce bycatch of sharks and rays), protected nursery areas, IMTA nutrient uptake, and nature-based solutions (dune restoration, *Posidonia oceanica* conservation) to build resilience and blue carbon stocks.

## 2.13 SWOT Analysis

- Strengths: rich biodiversity; strategic location; growing tourism demand; EU integration trajectory; active research community.
- Weaknesses: fragmented data; limited pilot-scale bioprocessing; seasonality; skills gaps; infrastructure bottlenecks at landing sites and labs.
- Opportunities: BlueBio value chains (algae, side-streams, bioactives); green port upgrades; eco-tourism; carbon and biodiversity credits; EU and regional funding.
- Threats: overfishing and habitat degradation; climate impacts; biosecurity risks; regulatory delays; market volatility for commodities and energy.

Here you can find the diagram of such SWOT Analyses in the Figure 2.



## SWOT Analysis

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>· Rich biodiversity</li> <li>· Strategic location</li> <li>· Growing tourism demand</li> <li>· EU integration trajectory</li> <li>· Active research community</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>· Fragmented data</li> <li>· Limited pilot-scale bioprocessing</li> <li>· Seasonality</li> <li>· Skills gaps</li> <li>· Infrastructure bottlenecks at landing sites and labs</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>· BlueBio value chains (algae, side-streams, bioactives)</li> <li>· Green port upgrades</li> <li>· Eco-tourism</li> <li>· Carbon and biodiversity credits</li> <li>· EU and regional funding</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>· Overfishing and habitat degradation</li> <li>· Climate impacts</li> <li>· Biosecurity risks</li> <li>· Regulatory delays</li> <li>· Market volatility for commodities and energy</li> </ul>

Figure 2. Graphical presentation of the SWOT Analyses results.

### 2.14 Roadmap and priority actions (2025–2030)

- 1) Establish a National BlueBio Program: multi-ministry task force, ABS framework, IP support, and competitive grants for pilots and start-ups.
- 2) Create a Pilot BlueBio Hub in Vlorë: algae and side-stream biorefinery, shared labs (HPLC/LC–MS/GC–MS), GMP/HACCP, and mentoring services.
- 3) Upgrade Coastal Infrastructure: hatcheries and nurseries, cold chain at ports, water-quality labs, and digital traceability platforms.
- 4) Finance and Investment: blended finance with de-risking instruments; SME vouchers for R&D; procurement that rewards circularity and low-carbon footprints.
- 5) Skills and Inclusion: vocational curricula, technician certifications, researcher–SME fellowships, and targeted support for women- and youth-led enterprises.



6) Nature-Based Solutions and MSP: designate aquaculture/innovation zones; restore seagrass and dunes; implement bycatch mitigation and selective gears in fisheries.

7) Market Development: branding for Albanian BlueBio products, participation in trade fairs, and compliance with EU quality and sustainability labels.

## 2.15 Monitoring and evaluation framework

- Input indicators: R&D funding for BlueBio, number of labs with accredited methods, hatchery capacity, cold storage volume, pilot plant availability.
- Output indicators: algae biomass produced, side-stream tonnage valorized, number of pilot products (nutraceuticals, cosmeceuticals, biofertilizers), patents and scientific publications.
- Outcome indicators: new SMEs and jobs created, export value of BlueBio products, tourism season length in eco/blue niches, reductions in nutrient loads and waste.
- Impact indicators: status of key habitats (seagrass extent, water quality), fish stock health metrics, blue carbon sequestration, and community resilience to climate shocks.

## 2.16 Data gaps and next steps

Immediate data priorities include:

- (i) harmonized coastal ecological baselines (e.g., seagrass cover, invasive species);
- (ii) high-resolution aquaculture site suitability mapping (hydrodynamics, carrying capacity);
- (iii) port waste and cold-chain audits;
- (iv) inventories of processing side-streams and current disposal practices; and
- (v) an RDI asset registry covering equipment, competencies, and ongoing projects.

A coordinated data platform, interoperable with EU standards, should be established to host and visualize these datasets.

### **Conclusion**

Albania's blue economy is at an inflection point. By pairing natural capital stewardship with targeted investments in blue biotechnologies, the country can diversify coastal livelihoods, increase value-added exports, and strengthen climate resilience. Early wins—algae pilots, side-stream biorefineries, and eco-innovation in ports and MPAs—can demonstrate feasibility and crowd in further capital. This baseline provides a roadmap to move from opportunity to implementation.



## 3. Feasibility study for Innovative Blue Economy and Blue Biotechnologies Start-Ups in Albania, by following the best practices from neighbour countries

### Summary

This feasibility study explores the opportunities and challenges of establishing innovative start-ups in the fields of the blue economy and blue biotechnologies in Albania. Drawing on best practices from neighbouring countries such as Greece, Italy, Montenegro, and Croatia, the report identifies enabling factors, barriers, and potential pathways for Albania to stimulate entrepreneurship in marine-based sectors. Key findings highlight that Albania's natural capital, EU integration trajectory, and emerging innovation ecosystem provide fertile ground for BlueBio start-ups. However, gaps exist in infrastructure, financing mechanisms, regulatory frameworks, and skills development. Neighbouring countries offer tested models of incubation programs, research-industry partnerships, blue accelerators, and cross-border clusters that Albania can adapt and scale.

### 3.1 Introduction and Objectives

The objective of this feasibility study is to assess Albania's readiness for BlueBio entrepreneurship and to recommend pathways for launching innovative start-ups that can attract investment, create jobs, and promote sustainability.

### 3.2 Methodological approach

The study applies a comparative methodology based on: (i) desk review of regional best practices; (ii) mapping of Albania's blue economy sectors; (iii) stakeholder consultation outcomes from government, academia, and private sector actors; (iv) analysis of enabling environments such as finance, policy, and infrastructure; and (v) a SWOT-based feasibility assessment.



## 3.3 Priority BlueBio Value Chains

### 3.3.1 Greece

Greece has leveraged EU Blue Growth strategies to develop marine biotechnology start-ups focused on algae cultivation, marine pharmaceuticals, and nutraceuticals. Key practices include university spin-offs, incubators in coastal cities, and Horizon Europe-funded BlueBio networks. Albania can replicate Greece's model of linking academia with SMEs through targeted R&D grants.

### 3.3.2 Italy

Italy's marine clusters in Trieste, Naples, and Bari demonstrate the power of regional hubs that combine research centers, start-ups, and port authorities. Blue Circular Economy initiatives valorize fishery by-products into bio-based materials and food supplements. Albania could adapt Italy's cluster-based innovation ecosystem to ports such as Vlorë and Durrës.

### 3.3.3 Montenegro

Montenegro has advanced small-scale aquaculture and tourism-linked start-ups, benefiting from international funding and coastal innovation projects. Notably, their success in integrating eco-tourism with aquaculture offers Albania a blueprint for community-based entrepreneurship in marine protected areas.

### 3.3.4 Croatia

Croatia has strong marine biotechnology research linked to the University of Zagreb and Split. Start-ups focus on marine bioactives, aquaculture genetics, and innovative aquafeeds. Croatia's BlueBio accelerators offer seed funding and mentorship programs that Albania could model, particularly in collaboration with EU institutions.

## 3.4 Albania's Blue Economy Potentials

### 3.4.1 Fisheries and Aquaculture

Albania's fisheries and aquaculture sector holds strong potential for diversification and innovation. Beyond traditional fishing, opportunities lie in value-added products from processing side-streams, Blue Economy and Blue Biotechnologies in Albania



which can reduce waste and improve profitability. The introduction of Integrated Multi-Trophic Aquaculture (IMTA)—where species like fish, shellfish, and algae are cultivated together—can enhance sustainability and productivity. Shellfish farming, particularly mussels and oysters, benefits from Albania’s clean coastal waters and growing export demand.

### 3.4.2 Tourism and Eco-innovation

The coastal tourism sector is shifting toward experience-driven and sustainable models. Albania’s underwater landscapes and marine biodiversity can support the growth of diving tourism and related adventure activities. Marine heritage experiences, such as exploring shipwrecks or coastal cultural traditions, can enrich tourist offerings. Meanwhile, sustainable gastronomy—highlighting seafood and local coastal cuisine—links tourism with community livelihoods and conservation.

### 3.4.3 Marine Biotechnology

Marine biotechnology is an emerging field where Albania can leverage its biodiversity and proximity to EU markets. Algae-based bio-products can contribute to food, feed, and bio-packaging industries. The exploration of marine-derived pharmaceuticals holds promise for novel compounds with medical applications. Additionally, the development of natural cosmetics based on marine ingredients (algae, seaweed extracts, minerals) aligns with global demand for eco-friendly and health-oriented products.

### 3.4.4 Renewable energy

Marine biotechnology is an emerging field where Albania can leverage its biodiversity and proximity to EU markets. Algae-based bio-products can contribute to food, feed, and bio-packaging industries. The exploration of marine-derived pharmaceuticals holds promise for novel compounds with medical applications. Additionally, the development of natural cosmetics based on marine ingredients (algae, seaweed extracts, minerals) aligns with global demand for eco-friendly and health-oriented products.

## 3.5 Enabling environment and barriers

Albania benefits from its **geographic proximity to EU markets**, which provides competitive advantages in terms of export logistics, regulatory alignment and market access. As a candidate for EU membership, Albania is increasingly aligning its economic and environmental policies with those of the European Union, thus positioning itself as a gateway for goods and services into the larger EU internal market. Additionally, the country possesses **strong biodiversity** – including rich marine and coastal ecosystems and important habitat areas – which underpin potential in aquaculture, eco-tourism and sustainable blue-economy ventures (SAP/RAC, 2023). Further, Albania has a **growing small and medium-sized enterprise (SME) ecosystem**, particularly in sectors linked to the blue economy,



tourism and processing, which offers the foundation for innovation, job creation and diversified value chains (WB 2020).

However, significant barriers remain that inhibit the full realisation of these opportunities. First, there is **limited access to finance**: many SMEs struggle to obtain affordable credit, investment capital or scaling-funds, particularly for ventures involving higher-risk technologies or value-chain upgrades. For example, tourism SMEs noted difficulties in accessing flexible lines of credit during the COVID-19 shock (IFC, 2022). Second, there is inadequate infrastructure for innovation, such as **laboratory and pilot-scale facilities**: the capacity to prototype, test, certify and upscale new products (for example, selective fishing gear technologies, RAS aquaculture modules or algae-based bio-processes) is constrained. The literature points to weak processing industries and the absence of modern wholesale fish markets as obstacles (Alite and Ceka, 2024). Third, the regulatory frameworks remain **fragmented** and not always fully coordinated: overlapping mandates among coastal, marine, fisheries, tourism and environmental agencies create complexity for investors and operators, and spatial planning is incomplete. For instance, a national biodiversity baseline highlighted gaps in institutional clarity and marine-coastal governance arrangements (SPA/RAC, 2023). Fourth, **weak research-industry linkages** hinder the translation of scientific knowledge into market-ready innovations or commercial applications: the process of co-development between academia, government and private firms remains under-developed, limiting uptake of new technologies, improved production methods or value-chain upgrading. A study on Albania's blue economy emphasises this weakness and calls for stronger collaboration (Alite and Ceka, 2024).

In sum, while Albania's strategic location, biological assets and emerging SME base present strong potential, realizing this potential will require interventions addressing capital access, innovation infrastructure, regulatory streamlining and effective knowledge transfer between science and enterprise.

### 3.6 Feasibility assessment

The feasibility of BlueBio start-ups in Albania is rated as medium-to-high, conditional on reforms and investments in enabling environments.

- Strengths: rich coastal resources, EU alignment, low labor costs.
- Weaknesses: infrastructure deficits, financing constraints, limited technical expertise.
- Opportunities: replication of regional incubators, participation in EU BlueBio programs, branding of Albanian marine products.
- Threats: climate risks, overexploitation of marine resources, bureaucratic delays.

Here you can find the diagram of the feasibility of BlueBio start-ups in Albania in the Figure 3.



## Feasibility of BlueBio Start-ups in Albania

*Feasibility rating: Medium-to-High (conditional on reforms and investments in enabling environments)*

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>· Rich coastal resources</li> <li>· EU alignment</li> <li>· Low labor costs</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>· Infrastructure deficits</li> <li>· Financing constraints</li> <li>· Limited technical expertise</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>· Replication of regional incubators</li> <li>· Participation in EU BlueBio programs</li> <li>· Branding of Albanian marine products</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>· Climate risks</li> <li>· Overexploitation of marine resources</li> <li>· Bureaucratic delays</li> </ul>

Figure 3. Graphical presentation of feasibility of BlueBio start-ups in Albania.

### 3.7 Roadmap and recommendations

- 1) Establish a Blue Economy Incubator in Vlorë, modeled on Italy's cluster system.
- 2) Launch a BlueBio Innovation Fund with EU and international partners to finance start-ups.
- 3) Strengthen academia–industry linkages, inspired by Greek spin-off models.
- 4) Develop eco-tourism and aquaculture synergies, as demonstrated in Montenegro.
- 5) Implement BlueBio accelerators, drawing lessons from Croatia's mentorship and seed funding programs.
- 6) Create enabling policies for access and benefit-sharing, intellectual property rights, and start-up facilitation.

### 3.8 Financing mechanisms

Feasible financing models include blended finance combining public, private, and donor funding; SME innovation vouchers; EU Horizon Europe and Interreg projects; and venture capital from regional investors. International development banks can also de-risk investments in early-stage BlueBio



enterprises.

### 3.9 Implementation Timeline (2025–2030)

Phase 1 (2025–2026): Stakeholder consultations, legal reforms, and incubator establishment.

Phase 2 (2026–2028): Pilot start-ups in aquaculture, marine bioactives, and eco-tourism; mid-term evaluation.

Phase 3 (2028–2030): Scaling successful models, cross-border collaboration, export market penetration.

#### **Conclusion**

Albania stands at a critical juncture to leverage its coastal and marine assets for innovative start-ups in the blue economy and blue biotechnologies. By adapting best practices from Greece, Italy, Montenegro, and Croatia, Albania can build a vibrant ecosystem that drives economic growth, sustainability, and regional integration. The roadmap outlined in this feasibility study provides a strategic foundation for translating opportunities into concrete entrepreneurial ventures.



## 4. Blue incubation roadmap for Albania

### 4.1 Blue Business Incubation Roadmap for Albania

#### *Summary*

This roadmap proposes a practical, partner-driven approach to incubate and scale Albanian start-ups and SMEs in the blue economy. It outlines the opportunity areas (fisheries, aquaculture, marine tourism, circular bioeconomy, maritime services), a structured incubation pipeline, financing options, and a 12–18-month implementation plan with measurable outcomes. Schemes included visualize the value chain, incubation flow, and stakeholder ecosystem.

#### 4.1.1 Context and Opportunity

Adriatic–Ionian coastline and inland waters enable diverse blue economy activities. Key growth levers include: upgrading fisheries and aquaculture productivity and sustainability; improving cold-chain and processing; developing eco- and cultural marine tourism; deploying digital services (traceability, booking, logistics); and valorizing by-products into high-value bioproducts. SMEs face barriers such as fragmented supply chains, limited product standards and certification, insufficient early-stage finance, and constrained access to testing sites (ports, labs) and markets. A dedicated incubation mechanism can de-risk innovation and accelerate market entry by connecting entrepreneurs with public infrastructure and private buyers (Figure 4).



## Blue Economy Value Chain Map (Albania)

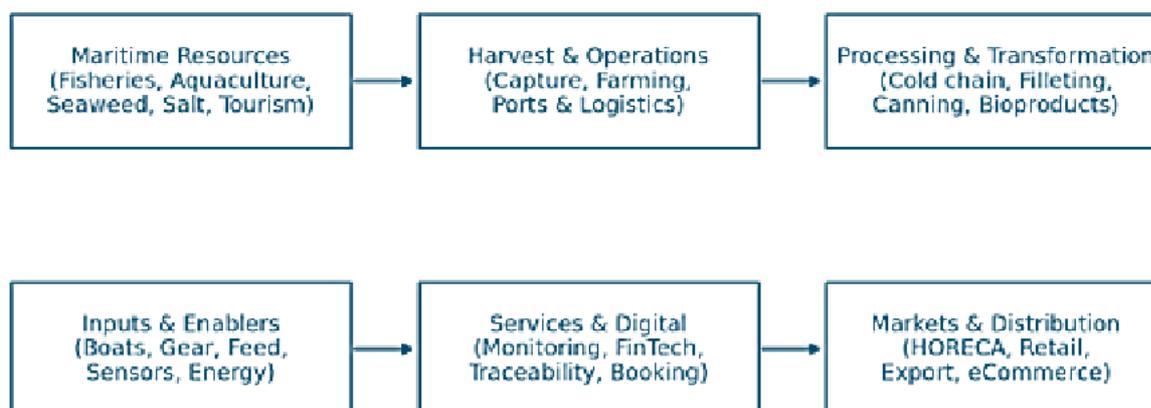


Figure 4. Scheme of blue economy value chain map.

### 4.1.2 Stakeholder landscape

The roadmap mobilizes a coalition of public and private actors: ministries and agencies (fisheries, environment, economy), ports and municipalities, universities and research centers, SMEs and cooperatives, investors and banks, and NGOs/donors. Each contributes assets such as regulatory guidance, pilot sites, labs, market access, and risk-sharing finance (Figure 5).



## Incubation Pipeline

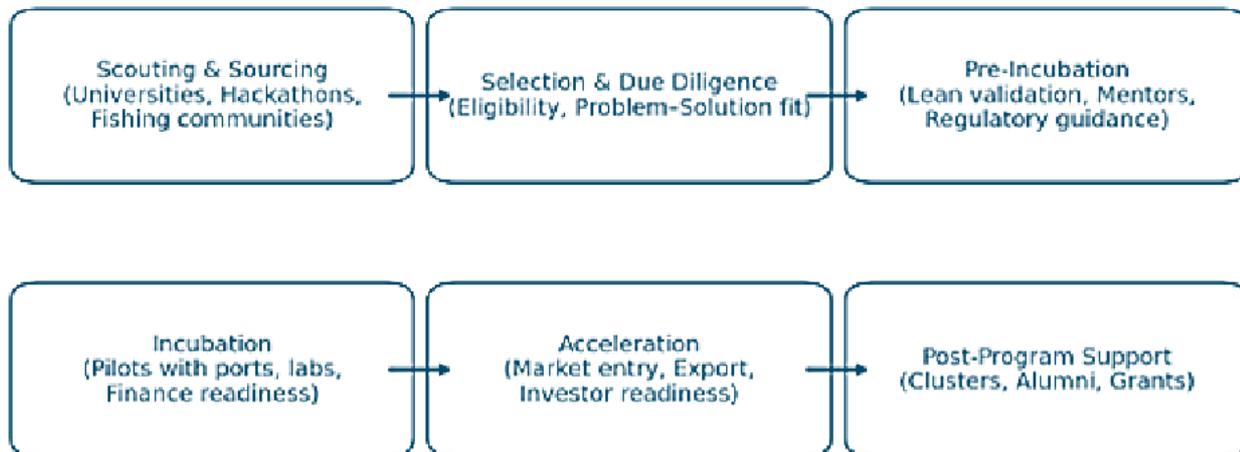


Figure 5. Incubation pipeline from sourcing to post-program support.

### 4.1.3 Incubation Model and Services

#### Phases and core services:

- Scouting & Sourcing (Months 0–2): Outreach across universities, fishing communities, and SMEs; idea calls; hackathons.
- Selection (Months 2–3): Transparent criteria on problem–solution fit, market potential, team, and environmental compliance.
- Pre-Incubation (Months 3–5): Customer discovery, regulatory guidance (licensing, food safety), prototype validation.
- Incubation (Months 5–11): Access to labs and testbeds (ports, hatcheries), pilots with buyers, IP and standards support, finance readiness.
- Acceleration & Post-Program (Months 11–18): Market entry, export pathways, investor and grant matching; alumni network.

#### Value-add services:

Mentorship pool; technical clinics (quality, HACCP, sustainability); digital enablement (traceability, e-bookings); market linkages (HORECA, retail, export); climate and environment safeguards; and access to blended finance.

## 4.1.4 Financing instruments

A blended finance stack can de-risk early-stage ventures:

- Small innovation vouchers and prototyping microgrants (€5k–€25k).
- Result-based seed tickets (€25k–€100k) tied to pilot milestones.
- Guarantee-backed working-capital lines via local banks.
- Export readiness grants for certification and branding.
- Crowdfunding and corporate off-take prepayments where relevant.

Below (Figure 6) is shown the graphical presentation of stakeholder ecosystem and flows of support.

### Stakeholder Ecosystem (Albania Blue Incubation)

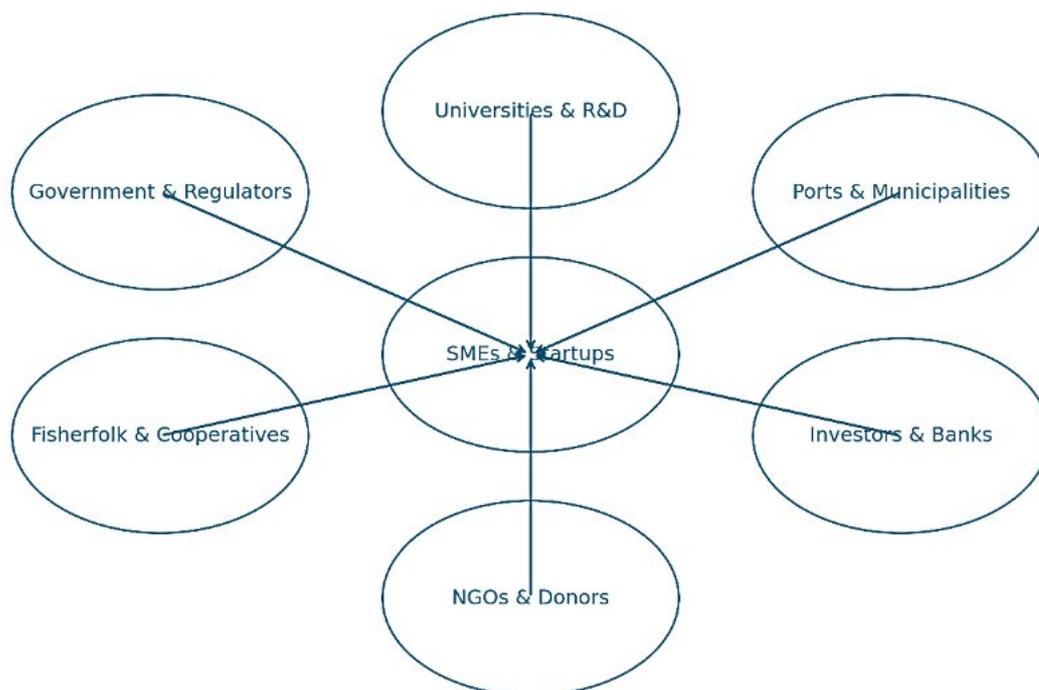


Figure 6. A graphics presentation of the scheme about stakeholder ecosystem and flows of support.

## 4.1.5 Implementation plan (12–18 months)

- Months 0–2: Governance setup, MoUs with ports/municipalities and universities; mentor onboarding;



open call launch.

- Months 3–5: Selection; pre-incubation bootcamps; diagnostics; pilot scoping with buyers and public assets.
- Months 5–11: Pilot execution; technical assistance; quality and certification support; investor days.
- Months 11–18: Market entry; export readiness; alumni platform; program evaluation and scale-up plan.

### 4.1.6 KPIs and Risk Management

KPIs: 60–90 ventures sourced; 20–30 pre-incubated; 10–15 piloted; 6–10 market entries; €0.5–1.5M mobilized; 20%+ women-led teams; 100+ jobs supported; measurable reductions in waste or emissions in pilot sites.

Risks and mitigations: regulatory delays (early regulator engagement and checklists); fragmented logistics (cluster pilots around ports); finance gaps (blended instruments and guarantees); skills gaps (mentor pool and targeted clinics).

#### **Conclusion**

The proposed incubation roadmap connects Albania's coastal assets and entrepreneurial talent with structured services and finance to unlock value in fisheries, aquaculture, marine tourism, maritime services, and the circular blue bioeconomy. With clear governance, pipeline-building, and pilot-driven acceleration, the program can turn promising concepts into market-ready ventures.

## 4.2 Blue Biotechnologies Incubation Roadmap for Albania

#### **Summary**

This roadmap presents a structured pathway to incubate and grow Albania's start-ups and SMEs in blue biotechnologies. It identifies key opportunity areas, stakeholder roles, incubation models, financing mechanisms, and a phased implementation plan. Visual schemes illustrate the value chain, incubation pipeline, and ecosystem actors.



### 4.2.1 Context and Opportunity

Albania’s coastline, marine biodiversity, and traditional fisheries create fertile ground for blue biotechnology innovation. Applications include marine pharmaceuticals, nutraceuticals, cosmetics, bio-materials, and aquaculture biotech. The sector is aligned with EU priorities and can drive sustainable growth, jobs, and exports if supported through incubation (Figure 7).

#### Blue Biotechnology Value Chain (Albania)

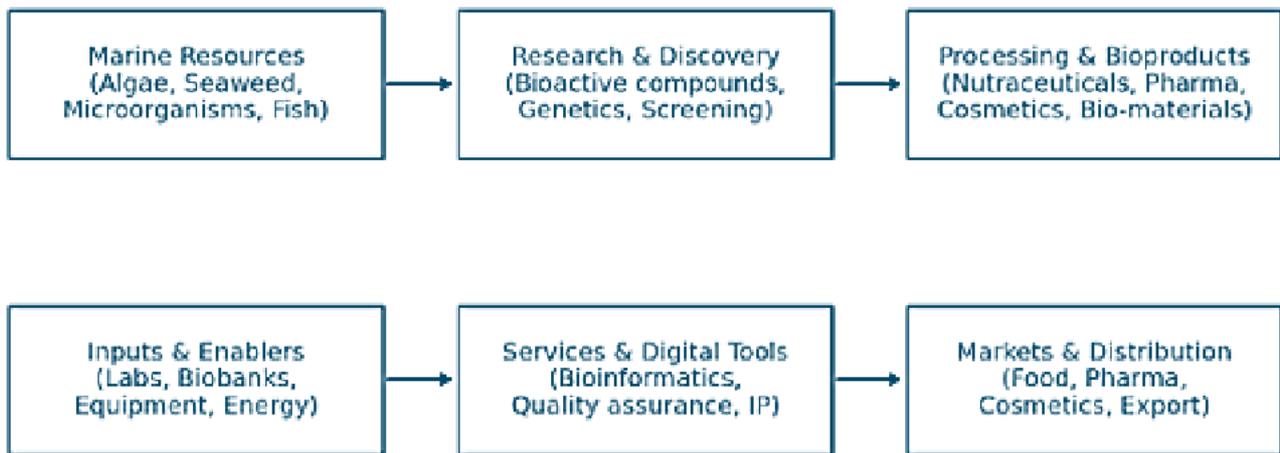


Figure 7. Scheme of blue biotechnologies value chain

### 4.2.2 Stakeholder landscape

Actors include ministries (economy, environment, health), universities and research centers, ports and labs, SMEs and fisherfolk, investors, and NGOs/donors. Their coordinated engagement is essential to provide research infrastructure, regulatory guidance, pilot sites, and financing (Figure 8).



## Blue Biotech Incubation Pipeline

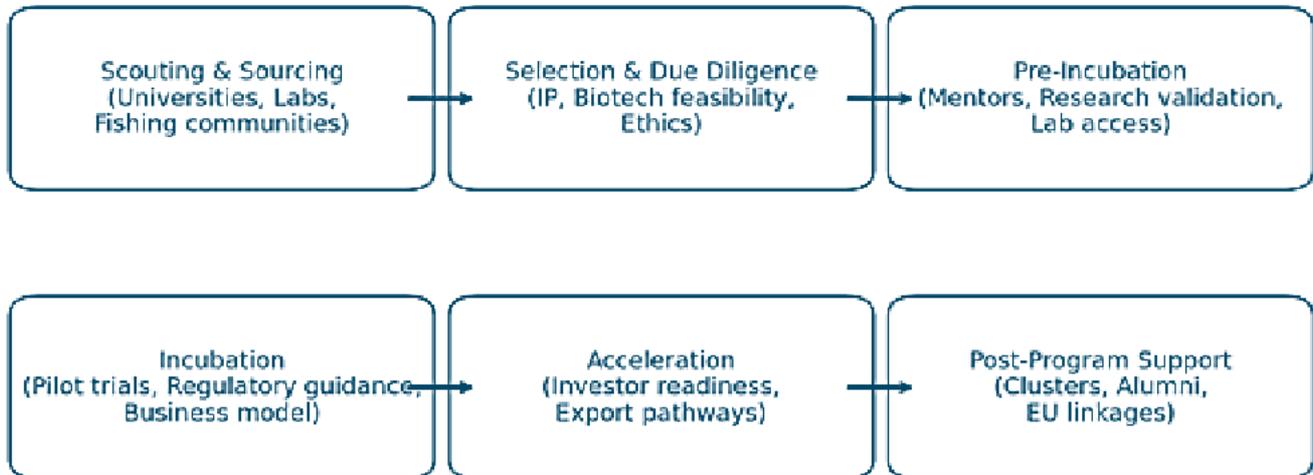


Figure 8. Scheme of proposed incubation pipeline.

### 4.2.3 Incubation Model and Services

#### Phases:

- Scouting & Sourcing: Engage universities, labs, and communities; innovation calls.
- Selection: Transparent process assessing feasibility, IP, ethics, and market potential.
- Pre-Incubation: Lab access, mentorship, prototype development, regulatory guidance.
- Incubation: Pilot trials, partnerships with ports and labs, finance readiness.
- Acceleration: Investor matchmaking, export readiness, EU research linkages.
- Post-Program: Alumni network, cluster integration, ongoing support.

#### Value-added services:

Mentorship, regulatory clinics, IP advisory, certification support, digital tools, market matchmaking, and blended finance facilitation.

### 4.2.4 Financing instruments

To de-risk biotech ventures, the roadmap suggests:

- Innovation vouchers and prototyping grants (€5k–€25k).



- Seed funding and equity support (€25k–€150k).
- Guarantee-backed loans *via* banks.
- Export readiness support for EU certification.
- Access to EU Horizon and BlueBio Cofund calls.

Below you can see the scheme of the stakeholder ecosystem (Figure 9.)

### Stakeholder Ecosystem for Blue Biotech Incubation (Albania)

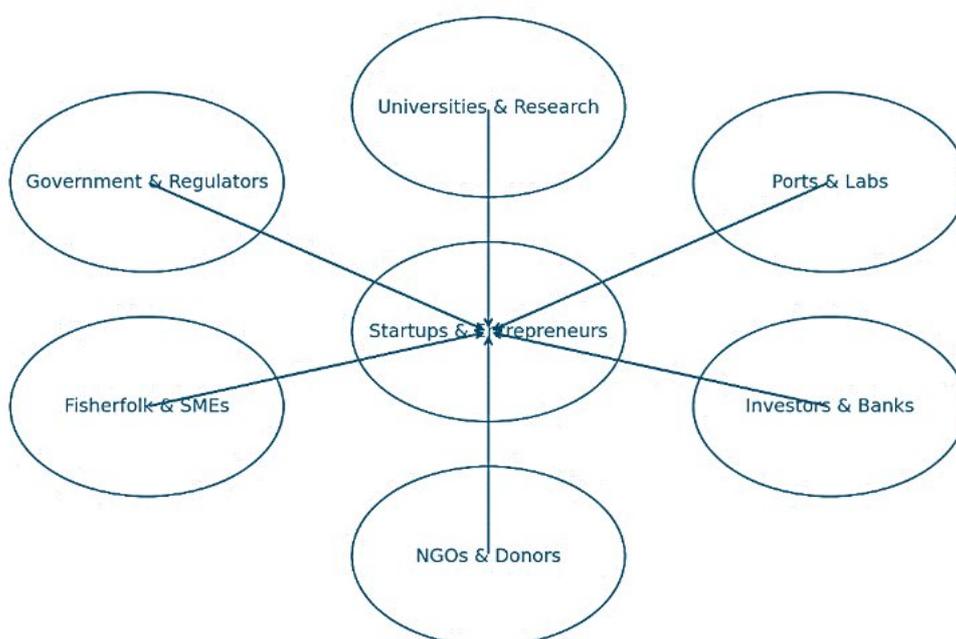


Figure 9. Graphical presentation of the proposed scheme about the stakeholder ecosystem.

#### 4.2.5 Implementation plan (12–18 months)

- Months 0–3: Governance, MoUs with universities and labs, mentor pool setup.
- Months 3–6: Selection, bootcamps, early diagnostics, prototype scoping.
- Months 6–12: Pilots, technical assistance, certification and IP support.
- Months 12–18: Market entry, investor engagement, EU program linkages, alumni platform.



## 4.2.6 KPIs and Risks

KPIs: 40–60 ventures sourced; 15–20 pre-incubated; 8–10 piloted; 5–7 market entries; €0.5–1M mobilized; 20%+ women-led teams; measurable environmental benefits.

Risks: Regulatory bottlenecks, limited lab access, finance gaps.

Mitigation: early regulator involvement, public–private lab sharing, blended finance solutions.

### **Conclusion**

A national incubation roadmap can transform Albania’s marine resources into biotech innovations, generating sustainable jobs and exports while contributing to environmental protection and EU integration.



## 5. National Policy Brief on Blue Economy and Blue Biotechnologies opportunities in Albania

### 5.1 National Policy Brief on Blue Economy Opportunities in Albania

#### *Summary*

This policy brief outlines the emerging opportunities and strategic actions for Albania to develop its blue economy, ensuring sustainable use of marine and coastal resources to support growth, jobs, and resilience.

#### 5.1.1 Key opportunity areas

- Sustainable Fisheries and Aquaculture – Modernization of fleets, adoption of digital monitoring, and eco-certification.
- Marine and Coastal Tourism – Development of eco- and cultural tourism, yacht marinas, and cruise services.
- Maritime Transport and Logistics – Upgrading port infrastructure, green shipping corridors, and digitalization.
- Renewable Energy – Offshore wind and solar-at-sea pilots, with potential for regional integration.
- Blue Bioeconomy and Circular Economy – Valorization of marine by-products into food, feed, and cosmetics.
- Research, Innovation and Digitalization – Smart sensors, data platforms, and digital services for traceability and logistics.

#### 5.1.2 Policy gaps and Challenges

Despite its potential, Albania faces challenges including fragmented governance, limited coordination



between ministries, weak enforcement of fisheries management, underinvestment in port and research infrastructure, and insufficient early-stage financing for innovative SMEs. Skills gaps, limited environmental monitoring, and low certification uptake also constrain competitiveness.

### 5.1.3 Policy recommendations

- Establish an integrated national Blue Economy Strategy and inter-ministerial coordination mechanism.
- Strengthen marine spatial planning and coastal zone management, aligned with EU directives.
- Expand investment in sustainable ports, cold chain, aquaculture facilities, and marine protected areas.
- Provide targeted incentives (innovation vouchers, blended finance) for SMEs and start-ups in blue sectors.
- Enhance training and skills development through universities, vocational schools, and regional partnerships.
- Mobilize international cooperation and funding (EU IPA III, WBIF, donor programs).

### 5.1.4 Expected impacts

By implementing these measures, Albania can achieve:

- Diversified and resilient coastal economies.
- Creation of 15,000+ new jobs in blue sectors over 10 years.
- Increased exports of certified seafood and maritime services.
- Enhanced coastal protection, biodiversity, and climate resilience.
- Stronger alignment with EU accession and regional integration.

### **Conclusion**

The blue economy presents Albania with a strategic opportunity to combine growth with sustainability. A coherent policy framework, investment in innovation and infrastructure, and inclusive stakeholder engagement are essential to unlock this potential and position Albania as a regional leader in the Adriatic–Ionian blue economy.



## 5.2 National Policy Brief on Blue Biotechnologies Opportunities in Albania

### Summary

This policy brief highlights the opportunities and strategic actions for Albania to develop its blue biotechnologies sector, leveraging marine resources for innovation, sustainability, and competitiveness in line with the EU Blue Economy Agenda.

### 5.2.1 Key opportunity areas

- Marine Pharmaceuticals – Bioactive compounds for antibiotics, anti-cancer, and anti-inflammatory drugs.
- Nutraceuticals and Functional Foods – Omega-3, algae proteins, and marine-derived supplements.
- Blue Cosmetics – Algae-based skincare and anti-aging products.
- Environmental Biotech – Bioremediation using marine microbes and seaweed for wastewater treatment and carbon capture.
- Bio-materials – Marine-derived polymers for biodegradable plastics and industrial applications.
- Aquaculture Biotech – Genetic improvement, disease control, and sustainable feed innovation.

### 5.2.2 Challenges

Despite the promising outlook, Albania faces structural barriers: limited R&D capacity and specialized laboratories, weak industry–academia collaboration, lack of financing for early-stage biotech ventures, gaps in regulatory frameworks for bioprospecting and intellectual property, and low awareness among entrepreneurs and investors.

### 5.2.3 Policy recommendations

- Develop a National Blue Biotechnology Strategy aligned with EU directives and innovation priorities.
- Invest in marine research centers, biobanks, and pilot laboratories for algae, marine microbes, and bioproducts.
- Foster academia–industry partnerships through innovation clusters and incubators.



- Introduce financial incentives (innovation grants, tax breaks, blended finance) for biotech start-ups and SMEs.
- Strengthen legal frameworks for marine genetic resources, IP rights, and benefit-sharing.
- Promote international cooperation with EU research programs (Horizon Europe, BlueBio Cofund).

## 5.2.4 Expected impacts

With strategic investment and policy alignment, Albania can achieve:

- Diversification of the blue economy into high-value biotech sectors.
- Creation of specialized jobs in research, innovation, and biotech entrepreneurship.
- Increased exports of marine-based bio-products with EU and global market access.
- Enhanced environmental sustainability through bioremediation and circular bioeconomy solutions.
- Stronger regional positioning as a Balkan hub for blue biotechnology innovation.

### **Conclusion**

Blue biotechnologies offer Albania a strategic opportunity to combine marine resource use with innovation, sustainability, and high-value job creation. A coordinated national policy framework, combined with targeted investments in R&D and entrepreneurship, can unlock Albania's potential to become a regional leader in this fast-growing sector.



## 6. Conclusions and Recommendations

### 6.1 Conclusions

Albania's blue economy and emerging blue biotechnology (BlueBio) sector are at a decisive turning point. The country benefits from rich biodiversity, a strategic location in the Adriatic–Ionian region, and alignment with EU integration and Mediterranean cooperation agendas. Traditional pillars such as fisheries, aquaculture, tourism, and maritime transport remain central to livelihoods, while new growth areas—marine renewable energy, ecosystem services, and BlueBio value chains—are gaining traction.

The baseline analysis demonstrates that opportunities in algae cultivation, fisheries side-stream valorization, marine bioactives, and microbial resources are particularly promising, provided that gaps in infrastructure, research capacity, and regulatory clarity are addressed. Similarly, the feasibility study on start-ups indicates that Albania could develop a vibrant BlueBio entrepreneurship ecosystem if bottlenecks in finance, skills, and enabling policies are overcome.

Pilot initiatives, notably the Vlorë algae and IMTA demonstration, show potential for scaling innovation while strengthening sustainability and climate resilience. However, risks remain from overfishing, habitat degradation, climate change, and bureaucratic delays. Without coherent policy frameworks, investment in infrastructure, and stronger academia–industry partnerships, Albania risks underutilizing its marine assets.

### 6.2 Recommendations

To unlock the potential of the blue economy and BlueBio sector, Albania should:

1. **Adopt a National BlueBio Strategy** aligned with EU directives and the Green Agenda for the Western Balkans, covering access and benefit-sharing, biosafety, and intellectual property frameworks.
2. **Invest in infrastructure and quality systems**, including hatcheries, cold-chain logistics, accredited labs, and pilot-scale bioprocessing hubs, with priority given to Vlorë as a demonstration hub.
3. **Establish dedicated incubation and financing mechanisms**—such as a Blue Economy Incubator, SME vouchers, and blended finance schemes—to de-risk early-stage ventures and attract private capital.



4. **Strengthen academia–industry collaboration**, building on models from neighboring countries, through joint research units, innovation clusters, and researcher–SME mobility schemes.
5. **Develop skills and human capital**, with targeted vocational training, certifications, and entrepreneurship programs that integrate women and youth.
6. **Integrate sustainability safeguards**, including marine spatial planning, selective fishing practices, and nature-based solutions to strengthen biodiversity and climate resilience.
7. **Enhance international positioning**, by branding Albanian BlueBio products, participating in EU and regional trade fairs, and leveraging cooperation with Horizon Europe and Interreg initiatives.

By implementing these recommendations, Albania can transform its blue economy into a driver of **sustainable growth, job creation, and EU integration**, positioning itself as a regional hub for innovation in the Adriatic–Ionian and wider Mediterranean.



## Annexes

### Annex 1: Illustrative Project Pipeline

- A1. Vlorë Algae & IMTA Pilot: 5–10 ha nearshore farm, hatchery upgrades, photobioreactors, biorefinery skid, and product certification for feed/biostimulants.
- A2. Fish Side-Stream Collagen/Gelatin Unit: modular extraction and drying line co-located with processors; cosmetics-grade QA; export partnerships.
- A3. Blue Port Green Upgrades: shore power pilot, waste reception enhancements, cold room expansion; digital traceability for fish/aquaculture shipments.
- A4. MPA Eco-Innovation Labs: citizen-science monitoring, dive tourism packages, bioactives sampling under ABS, and blue carbon restoration plots.
- A5. BlueBio Start-up Incubation: pre-seed grants, IP/legal support, and mentorship network linking researchers to SMEs.



## References

- Bakiu, R. (2019). *Innovation towards the sustainability of Mediterranean aquaculture – Region of Vlora case study*. European Union Regional Policy (presentation). Retrieved from [https://ec.europa.eu/regional\\_policy/rest/cms/upload/20092019\\_105738\\_euregionsweek\\_2019\\_R%20Bakiu.pdf](https://ec.europa.eu/regional_policy/rest/cms/upload/20092019_105738_euregionsweek_2019_R%20Bakiu.pdf) European Commission
- CPMR Intermed. (2025, May 6). 3, 2, 1... Go! The calls for innovative solutions about to be launched. Retrieved from <https://cpmr-intermed.org/uncategorized/3-2-1-go-the-calls-for-innovative-solutions-about-to-be-launched/18472/> CPMR Intermediterranean Commission
- CPMR Intermediterranean Commission and MedWaves, the UNEP/MAP Regional Activity Centre for SCP. (2022). *A Circular Blue Economy for the Mediterranean: Current practices and opportunities*, Barcelona. Interreg MED Blue Growth Community project and SwitchMed Programme. In-text citation: CPMR and MedWaves, 2022.
- Eurofish. (2023, December 14). *Albania – Fisheries and aquaculture sector overview*. Retrieved from <https://eurofish.dk/member-countries/albania/> Eurofish
- FAO. (2016). *FAO Fishery Country Profile: Albania*. Retrieved from [https://www.fao.org/fishery/docs/DOCUMENT/fcp/en/FI\\_CP\\_AL.pdf](https://www.fao.org/fishery/docs/DOCUMENT/fcp/en/FI_CP_AL.pdf) FAOHome
- Food and Agriculture Organization of the United Nations (FAO). (n.d.). *Albania – National Aquaculture Sector Overview*. Retrieved from <https://www.fao.org/fishery/en/countrysector/al/en> FAOHome
- Friend of the Sea. (2015) *An overview of Albanian seafood industry*. Retrieved from [https://friendofthesea.org/public/news/An%20overview%20of%20Albanian%20seafood%20industry\\_EN.pdf](https://friendofthesea.org/public/news/An%20overview%20of%20Albanian%20seafood%20industry_EN.pdf) Friend of the Sea
- Institute of Statistics of Albania (INSTAT). (n.d.). *Fishery*. Retrieved from <https://www.instat.gov.al/en/themes/agriculture-and-fishery/fishery/> instat.gov.al
- IPARD / Albanian Government. (2021). *Fishery Sector Study Report Final*. Retrieved from [https://ipard.gov.al/wp-content/uploads/2021/03/03-Fishery-Sector-Study\\_FINAL.pdf](https://ipard.gov.al/wp-content/uploads/2021/03/03-Fishery-Sector-Study_FINAL.pdf) ipard.gov.al
- IUCN & Partners. (2025). *Mediterranean Blue Carbon Strategy*. Retrieved from <https://portals.iucn.org/library/sites/library/files/documents/2025-015-En.pdf> portals.iucn.org
- Khanjani MH, Zahedi S, Mohammadi A. Integrated multitrophic aquaculture (IMTA) as an environmentally friendly system for sustainable aquaculture: functionality, species, and application of biofloc technology (BFT). *Environ Sci Pollut Res Int.* 2022 Sep;29(45):67513-67531. doi: 10.1007/s11356-022-22371-8. Epub 2022 Aug 3. PMID: 35922597.



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