

D3.1 Progressing towards the integration of maritime components of the EGD in sea planning and management of non-EU countries



MEDIGREEN
Mediterranean approach
towards a maritime European
Green Deal in MSP



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LIST OF ABBREVIATIONS

| Acronym | Definition |
|----------------|--|
| AZA | Allocated Zone for Aquaculture |
| CINEA | European Climate, Infrastructure and Environment Executive Agency |
| CNRDPA | Centre National de Recherche et de Développement de la Pêche et de l'Aquaculture (Algeria) |
| DCM | Decision of the Council of Ministers |
| DGPA | Direction Générale de la Pêche et de l'Aquaculture |
| DPA | Direction de la Pêche et de l'Aquaculture (Regional Fisheries Directorate, Algeria) |
| EGD | European Green Deal |
| EQO | Environmental Quality Objectives |
| EQS | Environmental Quality Standards |
| EMFAF | European Maritime, Fisheries and Aquaculture Fund |
| FAO | Food and Agriculture Organization of the United Nations |
| FLAGs | Fisheries Local Action Groups |
| GDP | Gross Domestic Product |
| GFCM | General Fisheries Commission for the Mediterranean |
| GIS | Geographic Information System |
| ICZM | Integrated Coastal Zone Management |
| IUU | Illegal, Unreported, or Unregulated Fishing |
| MADRP | Ministry of Agriculture, Rural Development and Fisheries (Algeria) |
| MPA | Marine Protected Area |
| MSP | Maritime Spatial Planning |
| NM | Nautical Miles |
| PNDA | Plan National de Développement de l'Aquaculture (Algeria) |
| RLF | Recreational and Leisure Fishing |
| RPOA | Regional Plan of Action for Small-Scale Fisheries |
| SEA | Strategic Environmental Assessment |
| SSF | Small-Scale Fisheries |
| VMS | Vessel Monitoring System |
| WP | Work Package |



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1. INTRODUCTION

1.1 Context

The MEDIGREEN project “*MEDiteranean approach towards a maritime European GREEN Deal in MSP*” promotes a Green Deal approach to Maritime Spatial Planning (MSP) across the Mediterranean basin for four specific sectors: fisheries, aquaculture, offshore renewable energies and nature protection. Funded under the European Maritime Fisheries and Aquaculture Fund (EMFAF) (Grant Agreement No. 101182580, Call EMFAF-2023-PIA-MSP), MEDIGREEN brings together EU and non-EU partners to ensure the principles of the European Green Deal (EGD) are coherently transposed into national MSP frameworks, including those of neighbouring partner countries.

Work Package 3 (WP3) focuses on extending these principles to non-EU partner countries through regional-scale actions and by national actions, specifically through task 3.1, to Algeria and Albania, to ensure cross-border coherence in marine governance and to test the transferability of EGD-aligned MSP approaches in different institutional and ecological contexts.

Task 3.1 aims to provide the analytical foundation for the WP3 pilot actions in Algeria and Albania. Its specific objectives are to map existing and planned marine space uses, identify candidate zones for aquaculture development and small-scale fisheries through multi-criteria GIS analysis, assess spatial conflicts between competing uses and conduct a comprehensive stakeholder mapping to document governance capacities and data gaps.

1.2 Objective of the deliverable

Deliverable D3.1 defines and documents the specific pilot actions undertaken in Algeria and Albania under Task 3.1 (Spatial analysis and stakeholder mapping). For Algeria, the focus is on integrating sustainable marine aquaculture development into an emerging MSP framework through the identification of Allocated Zones for Aquaculture (AZAs), spatial conflict resolution, and multi-stakeholder engagement. For Albania, the action centers on preparing the basis for integrating small-scale fisheries (SSF) into the future MSP process, in particular by improving the availability and use of spatial data and ensuring their systematic consideration in planning and decision-making.

1.3 Scope and added value of WP3 pilots

- Both countries share a coastline along the Mediterranean Sea and are engaged in regional (bilateral and multilateral) coastal and marine governance frameworks, making them relevant test cases for exploring MSP coherence across the basin.
- The pilot actions demonstrate how MSP can support sectoral transition in line with European Green Deal objectives, in particular by promoting sustainable seafood production and reducing pressures on marine ecosystems, through the spatial



integration of key sectors (notably aquaculture and SSF), the identification of interactions and conflicts, and their integration into planning and decision-making processes.

- The pilots produce transferable lessons and methodological tools applicable to other non-EU Mediterranean countries at similar stages of MSP development.
- The engagement of CNRDPA for Algeria ensures scientific rigour and institutional embedding of the outputs.
- The involvement of NGO Hydra for Albania, with established experience in SSF, enabled direct engagement with local fishing communities, while the contribution of national experts ensured a grounded understanding of the sector's structure, operating conditions and interactions with other sectors.
- Within the project, in Albania, the spatial distribution of SSF and other key sectors and themes, including AZAs, beach areas and fishing zones, as well as their interactions, was identified and analysed for the first time, supported by the preparation of GIS-based data and spatial layers. These results will feed into the national GIS-based planning database, strengthening the marine knowledge base and contributing to the establishment of enabling conditions for the effective implementation of MSP in Albania. In particular, they support the integration of SSF into MSP, a component often underrepresented in planning processes.

2. METHODOLOGY

2.1 Conceptual framework: MSP & European Green Deal

The methodological approach adopted under WP3 builds on the MSP-EGD analytical framework developed in MEDIGREEN Deliverable D2.1. where MSP is considered a strategic governance tool to support the implementation of European Green Deal objectives in marine and coastal areas. The MSP-EGD nomenclature identifies six EGD¹ key topics related to the marine environment and maritime activities (Table 1).

Table 1. The six EGD key topics and their relevance to MSP

| EGD Topic | Description |
|---|--|
| A. Climate change mitigation | Reducing GHG emissions from maritime activities; supporting offshore renewable energy deployment |
| B. Climate change adaptation | Increasing resilience of marine ecosystems and coastal communities to climate change |
| C. Sustainable seafood production | Promoting sustainable fisheries and aquaculture, reducing pressure on wild fish stocks |
| D. Biodiversity & ecosystem protection | Protecting and restoring marine ecosystems, MPAs, sensitive habitats, key species |
| E. Blue economy | Supporting sustainable coastal and maritime economic development contributing to food security |
| F. Zero pollution | Preventing and reducing marine pollution: nutrient runoff, marine litter, harmful substances |

2.2 Analytical steps

Each pilot action followed a structured but flexible workflow, combining the following elements:

- Desk review of national legal frameworks, sectoral plans, and scientific literature and stakeholder mapping
- Collection of data, also through stakeholder consultations.
- Spatial analysis and GIS to map existing marine uses, protected areas, fishing zones, including SSF and recreational fishery, and candidate AZA zones.
- Conflict identification through stakeholder consultations and spatial overlay analysis.
- Policy recommendations.

¹ Bocci M. et al. (2026). A framework for integrating the European Green Deal into Maritime Spatial Planning, *Frontiers in Ocean Sustainability*, <https://doi.org/10.3389/focsu.2026.1751387>



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2.3 Stakeholder engagement and assessment approach

Rationale for a stakeholder-centred approach

Maritime Spatial Planning cannot be conducted as a purely technical exercise. The effectiveness of any spatial plan, and in particular the legitimacy of decisions on zone allocation, resource access, and conflict resolution, depends fundamentally on the quality and inclusiveness of the stakeholder engagement process. This principle is embedded in the EU MSP Directive (2014/89/EU), the GFCM Guidelines on AZA designation, and the FAO Code of Conduct for Responsible Fisheries, all of which emphasise participatory governance as a prerequisite for sustainable outcomes.

In the context of non-EU Mediterranean countries such as Algeria and Albania, where MSP processes are still developing, stakeholder engagement also serves a very practical purpose. It helps bridge gaps in data, where official statistics and spatial information are limited. Knowledge from fishing communities, aquaculture operators and local authorities is therefore essential to understand how marine space is used in practice and to support the spatial analysis.

In both countries, a stakeholder process was initiated early in the implementation of Task 3.1 to identify key stakeholders with an interest in, or potential impact on, the marine activities under study.

In particular, in Algeria, the mapping followed a four-step process:

- **Step 1** – Desk review: identification of relevant institutions, organisations, and community groups through analysis of national legislation, sectoral strategies, and previous project documentation.
- **Step 2** – Snowball consultation: each institution initially contacted was asked to identify additional relevant stakeholders not yet included in the mapping, ensuring that informal networks and community-level actors were captured.
- **Step 3** – Categorisation: stakeholders were classified by tier (national policy, research and technical, regional implementation, sector users, civil society) and by their type of interest (regulatory authority, resource user, knowledge provider, affected community, environmental guardian).
- **Step 4** – Conflict of interest assessment: stakeholders were preliminarily assessed for potential conflicts of interest, particularly between resource users with competing claims to marine space, to inform the design of participatory processes that manage power asymmetries.

In Albania, a more informal and practice-oriented approach was applied. While a structured stakeholder mapping exercise was not carried out, stakeholder identification was based on a combination of desk review and iterative consultations during fieldwork and national meetings. Given the absence of formally organised SSF associations, particular reliance was placed on local knowledge and networks, notably through the involvement of NGO Hydra, which played a key role in identifying and engaging relevant actors at the local level. This



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approach allowed for the inclusion of both institutional stakeholders and individual fishers, as well as other locally embedded actors who may not be captured through formal mapping processes. While less structured, this method proved effective in reflecting the actual configuration of stakeholders and ensuring that locally grounded perspectives were considered.

Engagement modalities

Given the different institutional contexts, the engagement modalities were adapted to each country's context.

In Algeria, structured consultations were conducted with the Regional Fisheries Directorate (DPAs) of fourteen coastal Wilayas² through a standardised survey instrument developed by CNRDPA. The survey collected primary data on site selection criteria, AZA awareness, observed conflict profiles, available cartographic tools, and institutional recommendations. This field survey, presented in detail in Section 3.4.1, constitutes the primary source evidence base for the governance gap analysis and the conflict assessment. Additional consultations were held with MADRP/DGPA, the Ministry of Environment, and aquaculture operators, which were presented in the framework of the regional MEDIGREEN workshop held in Tunisia on 26 November 2025.

In Albania, stakeholder engagement was carried out through a combination of field-based consultations and targeted national-level discussions. Direct consultations were conducted with fishing communities along key coastal areas of both the Adriatic and Ionian coasts, including Shëngjin, Durrës, Vlorë (including Oriku) and Sarandë. These field visits enabled the identification of SSF fishing grounds based on stakeholder inputs, as well as the collection of local ecological knowledge on seasonal patterns, gear use, specific issues within the sector and interactions with other coastal activities.

Given the absence of formally organised SSF associations, engagement relied primarily on individual fishers, local actors, supported by knowledge and facilitation by NGO Hydra. Additional input was gathered through meetings with MPA management authorities, particularly in areas such as Karaburun–Sazan.

At the national level, findings were presented and discussed during stakeholder consultation meetings. This included a dedicated meeting held in Vlorë on 4 February 2026, bringing together stakeholders from the Vlorë region, one of the key areas where fisheries, aquaculture, tourism and natural values converge.

It also included a national consultation meeting held in Tirana on 26 February 2026, which brought together representatives from key institutions, including the Ministry of Environment, Ministry of Infrastructure and Energy, Ministry of Agriculture and Rural Development, National Agency of Territorial Planning, National Agency of Protected Areas

² Wilaya is an administrative region equivalent to a province or state. Algeria has 69 wilayas, of which 14 have a coastal frontage



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(with its regional agencies as well) and the Directorate of Fishery and Aquaculture Services.

These discussions provided an opportunity to validate the initial results, gather feedback and further refine the analysis.

Stakeholder assessment framework

Beyond mapping and consultation, the MEDIGREEN approach introduces a structured stakeholder assessment component, applied in particular in the Algeria pilot, which evaluates the functional capacity of key stakeholder groups to participate in and contribute to MSP processes. This assessment distinguishes between three dimensions:

- Institutional capacity: the existence and effectiveness of formal mandates, coordination mechanisms, and technical resources within governance bodies.
- Data and knowledge capacity: the availability, quality, and accessibility of spatial and thematic data held by different stakeholders.
- Participatory capacity: the practical ability of stakeholders, particularly resource users and community-level actors, to engage meaningfully in planning consultations, including awareness of MSP frameworks, access to information, and skills in conflict articulation.

The results of this assessment directly inform the capacity-building recommendations developed in Sections 3.6.4 and 4.6, and will underpin the training and dialogue activities planned under Task 3.2 of the project. In both country contexts, the assessment confirmed that the most significant bottlenecks to effective MSP participation are not a lack of willingness among stakeholders, but rather a combination of institutional fragmentation, data deficiencies, and limited awareness of MSP as a planning paradigm, gaps that targeted capacity building and inter-institutional coordination mechanisms can meaningfully address.



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3. ALGERIA: INTEGRATING SUSTAINABLE AQUACULTURE INTO MSP

3.1 National context

Algeria, with a Mediterranean coastline of 2,148 km, is one of the largest coastal states in the southern Mediterranean. Its marine territory includes a remarkable diversity of ecosystems, coastal lagoons, sandy bays, rocky shores, and offshore shelf habitats, offering significant ecological and economic potential. Aquaculture plays an increasingly important role in Algeria's strategy for food security, economic diversification, and sustainable coastal development, evolving in a Mediterranean context characterised by strong seafood demand and growing environmental and spatial constraints (UNEP/MAP, 2021).

Over the past twenty years, Algeria has undertaken a series of institutional, regulatory, and technical reforms (UNEP/MAP, 2021) aimed at structuring the aquaculture sector, stimulating investment, and better organising the use of marine space through the planning of Aquaculture Activity Zones (Allocated Zone for Aquaculture - AZAs). This national effort is formalised in the Aquapêche 2030 strategic plan, which targets a significant increase in production volumes, employment creation, and the emergence of higher value-added production segments. Marine Spatial Planning (MSP) is a relatively new but increasingly recognised concept in Algeria, with MEDIGREEN having provided a key Euro-Mediterranean cooperation framework for advancing sustainable, spatially integrated marine aquaculture.

3.1.1 Institutional architecture

The governance of the aquaculture sector is structured around a layered institutional framework:

- **DGPA:** General Directorate of Fisheries and Aquaculture (DGPA): The main authority in charge of sector policy, coordinating national and local institutions, and keeping track of production data.
- **DDA:** Directorate for Aquaculture Development (DDA): Leads sector strategy at central level and coordinates the implementation of the Aquapêche 2030 plan.
- **CAPA:** Algerian Chamber of Fisheries and Aquaculture (CAPA): Represents professionals, facilitates investment, and serves as an interface between operators and the administration.
- **CNRDPA:** CNRDPA: The national fisheries and aquaculture research center. Plays a key role in applied research, development of decision-support tools (including the national mapping portal), and scientific coordination of environmental monitoring networks (RESANAL, ALPHYSNET). Algeria's lead MEDIGREEN partner.
- **DPA (14 wilayas):** Directions de la Pêche et de l'Aquaculture (DPAs): 14 regional-level agencies responsible for implementing public policies, supporting investors, and validating concession applications at the wilaya level. They serve as the primary

technical interface for project approval.

- **Wilaya Commissions:** Wilaya Commissions: Multi-sectoral commissions at the regional level (fisheries, state property, water resources, agriculture, tourism, transport, defense and environment) that examine technical feasibility, potential conflicts of use, and consistency with spatial planning instruments for each aquaculture project.

3.1.2 Legal and regulatory framework

Aquaculture development in Algeria is governed by a structured legal framework centered on the 2001 fisheries law and complemented by a series of executive decrees and technical circulars (Table 2). This regulatory architecture is currently being updated to better address sector growth, environmental integration, and MSP requirements:

Table 2. *Main legal texts governing aquaculture and AZAs in Algeria*

| Legal Text | Main Purpose | Key Content |
|--|--|--|
| Law No. 01-11 of 3 July 2001 (as amended) | General framework for fisheries and aquaculture | Establishes sustainable resource management principles; regulates aquaculture activities; provides a concession regime; legally underpins AZA creation (Art. 16) |
| Executive Decree No. 04-373 (21 November 2004) | Concession granting procedure | Sets conditions for granting concessions; defines examination procedure, technical commission roles, and obligations of concession holders |
| Executive Decree No. 07-208 (30 June 2007) | Conditions for rearing aquatic species | Defines types of establishments; sets operating rules, technical and sanitary obligations including environmental monitoring provisions (Art. 15-17) |
| Executive Decree No. 19-156 (30 April 2019) | Creation, delineation and classification of AZAs | Establishes a legal regime of AZAs; principles for zoning, allocation and management; links with sustainable development policies |
| Technical Circulars No. 44, 88, 89, 90 (12 May 2014) | Sustainable aquaculture development programme | Specifies technical requirements for project design, assessment, monitoring, and site selection scoring criteria |
| Draft Decree on AZA Organisation (in preparation) | Operational implementation of AZAs | Aims to detail management arrangements, governance, environmental monitoring, and inter-sectoral coordination |

A draft decree on AZA organisation and management is under preparation and represents a critical regulatory milestone: its adoption will clarify management responsibilities, monitoring procedures, stakeholder participation arrangements, and the enforceable link between AZAs and national MSP planning. The ongoing process replaces the 2001 fisheries law with a broader framework law that integrates environmental, economic, and spatial dimensions, offering a further opportunity for alignment with MEDIGREEN objectives.



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3.1.3 Site selection and AZA scoring system

The concession and AZA designation process follows a seven-step procedure, from submission of the investment application by the investor through to the issuance of a final operating licence by the DPA. DPAs rely on a national scoring grid developed by CNRDPA to assess proposed sites. The scoring system evaluates:

- Location parameters: distance to port, road accessibility, logistics;
- Oceanographic characteristics: bathymetry, seabed substrate type, current velocity, water quality indicators;
- Potential conflicts of use: proximity to fisheries grounds, tourism areas, desalination plants, and marine protected areas.

Sites are classified into four categories based on their score: non-suitable area (score < 14), low-interest area (14–19), medium-interest area (20–30), and high-interest area (31–39). Only medium- and high-interest areas are retained for project approval. This scoring methodology provides the technical basis for AZA delineation and feeds directly into the national marine aquaculture mapping portal³ [Aquamap](https://aquamap-algerie.cdta.dz/), which centralises georeferenced data on concessions, infrastructure, and environmental parameters, a key spatial decision-support tool developed by CNRDPA and directly relevant to the MEDIGREEN GIS analysis.

3.2 Current state of aquaculture and spatial interactions

3.2.1 Overall production dynamics (2020–2024)

Between 2020 and 2024, Algerian aquaculture production shows an overall upward trend, driven by the strengthening of the marine segment and the growth of inland aquaculture (DGPA, 2025). Total production rose from 4,535 tonnes in 2020 to 6,659 tonnes in 2024, representing a 47% increase over the period, with a peak of 6,925.9 tonnes in 2023. Marine production increased from 3,402 tons in 2020 to 4,814 tons in 2024—a 41% increase—with a peak of 4,834.9 tons in 2023, confirming the structuring role of marine fish cage farming in driving sector growth. Inland aquaculture grew from 1,133 tonnes to 1,845 tonnes over the same period.

³ <https://aquamap-algerie.cdta.dz/>



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Table 3. Evolution of aquaculture production in Algeria (2020–2024)

| Year | Marine production (t) | of which: Fish farming (t) | of which: Shellfish (t) | Inland production (t) | TOTAL aquaculture (t) |
|------|-----------------------|----------------------------|-------------------------|-----------------------|-----------------------|
| 2020 | 3,402 | 3,273.38 | 128.85 | 1,133 | 4,535 |
| 2021 | 2,601 | 2,548.68 | 52.72 | 1,303 | 3,904 |
| 2022 | 3,328 | 3,265.65 | 62.13 | 1,321 | 4,649 |
| 2023 | 4,834.9 | 4,798.09 | 36.80 | 2,091 | 6,925.9 |
| 2024 | 4,814 | 4,784.70 | 28.85 | 1,845 | 6,659 |

This growth dynamic is reflected in the investment indicators: by end-2023, 549 aquaculture projects had been approved (325 marine, 224 inland), 256 concessions had been granted (mainly at sea), and 86 farms had been established (55 at sea, 31 in freshwater), with installed production capacity exceeding 20,000 tonnes per year.

Table 4. Aquaculture projects, concessions and farms (end 2023)

| Indicator | Total | Marine | Inland |
|---|----------|--------|--------|
| Approved projects | 549 | 325 | 224 |
| Concessions granted | 256 | - | - |
| Farms established | 86 | 55 | 31 |
| Installed production capacity (t/year) | > 20,000 | - | - |
| Share of aquaculture in the national seafood supply | ≈ 5% | - | - |

Despite this growth in installed capacity, actual output remains below potential, accounting for only approximately 5% of the national seafood supply. This gap between installed capacity and effective production is attributable to a combination of financial, administrative, technical, and organisational constraints that slow the operationalisation of concessions and limit continuity of activity on some farms—a structural challenge that the Aquapêche 2030 plan directly targets.

3.2.2 Marine aquaculture: dominance of cage farming

The marine segment relies almost exclusively on floating cage farming of European seabass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*), which together account for the bulk of the volume. Gilthead seabream is the dominant species, reaching approximately 4,552 tonnes in 2023 and 4,366 tonnes in 2024, representing over 90% of marine fish farming output. European seabass, while at lower volumes, shows a positive trend, reaching 418.9 tonnes in 2024 (up from 300.6 tonnes in 2020).

Table 5. Marine aquaculture production by main species (2020, 2023, 2024)

| Year | European Seabass (t) | Gilthead Seabream (t) | Mussels (t) | Oysters (t) | Total marine (t) |
|------|----------------------|-----------------------|-------------|-------------|------------------|
| 2020 | 300.6 | 2,972.8 | 109.6 | 19.2 | 3,402 |
| 2023 | 245.8 | ≈ 4,552 | 27.1 | 9.7 | 4,834.9 |
| 2024 | 418.9 | ≈ 4,366 | 18.2 | 10.7 | 4,814 |

In Figure 2, approximately 22 very small farms using sub-surface longlines are undergoing significant contraction in shellfish farming. Production fell sharply from 128.85 tonnes in 2020 to just 28.85 tonnes in 2024, a 78% decline over four years. This reflects a combination of technical and sanitary difficulties, economic fragility of small-scale units, water quality constraints, and the limited availability of suitable shellfish farming sites along the Algerian coast. This trend is of particular concern, given the lower spatial conflict profile and environmental co-benefits of shellfish farming identified in the analysis conducted in Algeria in the framework of MEDIGREEN.

Spatially, marine production is organised around approximately thirty cage farm sites, of which only 18 are actually in operation, the others being idle or under development. Large installations such as the El Mokretar farm, with 36 floating cages, illustrate the potential for industrial-scale development. The national marine aquaculture mapping portal, developed by CNRDPA⁴ and populated with georeferenced data on concessions, infrastructure, and environmental parameters, is the primary spatial decision-support tool for AZA planning and conflict management.

Looking ahead, available projections suggest that combined seabass and seabream production could exceed 10,000 tonnes by 2025–2026, more than double current levels, as newly installed farms come on stream and already-granted concessions are progressively activated. This anticipated expansion substantially heightens the urgency of resolving spatial conflicts, finalising AZA designations, and strengthening environmental monitoring.

⁴ <https://aquamap-algerie.cdta.dz/>

3.2.3 Inland aquaculture: consolidation and diversification

The inland segment, essentially integrated into agriculture through hill reservoirs, dams, and farm ponds, is also growing and diversifying. From 2020 to 2024, total inland production went up from 1,133 tonnes to 1,845 tonnes, with a record 2,091 tonnes in 2023. Carp and other cyprinids dominate, reaching 1,224 tonnes in 2024 and forming the backbone of freshwater fish farming. Tilapia is emerging as the rising species, with production increasing from 417.4 tonnes in 2020 to 536 tonnes in 2024, now exceeding pike-perch and spirulina combined.

Table 6. *Inland aquaculture production by species (2020, 2023, 2024)*

| Year | Carp & Cyprinids (t) | Tilapia (t) | Pike-perch (t) | Spirulina (t) | Total freshwater (t) |
|------|----------------------|-------------|----------------|---------------|----------------------|
| 2020 | 646.2 | 417.4 | 69.8 | 0 | 1,133 |
| 2023 | 1,589.8 | 428.2 | 73.3 | 0.06 | 2,091 |
| 2024 | 1,224.0 | 536.0 | 85.3 | 0.07 | 1,845 |

Small-scale spirulina production initiatives have appeared since 2022 and, while still marginal in volume, are indicative of growing diversification towards higher value-added products. Projects for bluefin tuna fattening and shrimp farming have been approved but are not yet in operation, illustrating growing interest in specialised market segments. Innovative tilapia projects, including cage culture in large irrigation reservoirs (e.g., by the COSIDER public group) and aquaponic systems supported by start-up promotion schemes, represent an emerging frontier for the sector.

3.2.4 Environmental monitoring of aquaculture environments

Environmental monitoring of aquaculture sites is managed through two networks coordinated by CNRDPA and the LANCAPPASM laboratory:

- **RESANAL:** RESANAL network: Monitors water quality at aquaculture sites, covering pH, dissolved oxygen, total alkalinity, suspended solids, chlorophyll a, nutrients, organic matter, bacteriological indicators (faecal coliforms, streptococci, salmonella), and metal contamination (copper, nickel, cadmium, lead and zinc) in water, sediments, and biota.
- **ALPHYNET:** ALPHYNET network: Dedicated to monitoring toxic phytoplankton in shellfish-growing areas and marine farm sites, detecting microalgae producing toxins or harmful blooms. Sampling frequency remains irregular, limiting the network's ability to provide continuous risk assessment.



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A critical regulatory gap constrains the effectiveness of these networks: Algeria does not yet have national Environmental Quality Standards (EQS) or Environmental Quality Objectives (EQO) specific to aquaculture environments. The modalities for monitoring are mentioned in Executive Decree No. 07-208 (Articles 15–17), but implementing orders setting thresholds, frequencies, and protocols have not yet been issued. In practice, CNRDPA and technical institutions rely on European standards or FAO/GFCM and recommendations developed under cooperation projects (TCP, DIVECO, etc.).

An environmental monitoring project is being implemented in cooperation with the Ministry of the Environment, aiming to improve spatial and temporal coverage of measurements and strengthen analytical capacity. The national mapping portal is expected to progressively incorporate environmental data layers (physicochemical, biological, sanitary, and conflict of use data), enabling cross-referencing of production data with environmental status to guide AZA management decisions, a development directly aligned with MEDIGREEN's ecosystem-based MSP approach.

3.2.5 Marine space uses and competing activities

The spatial analysis conducted by CNRDPA under Task 3.1 mapped the full range of marine space uses along Algeria's coast, identifying areas of existing aquaculture activity and their spatial relationships with other sectors. The mapping datasets included aquaculture farm locations, Marine Protected Areas (MPAs), desalination plants, bathymetric contours, untrawlable bottoms, and trawlable fishing grounds as presented in Tunisia's Conference. The 2,148 km coast is already a highly contested marine space, with aquaculture installations, predominantly finfish cage farms, located within the same 0–35 m depth band as artisanal fishing grounds and trawlable areas. Conflicts between aquaculture, fisheries, desalination plants, and MPAs have been reported at multiple locations, as detailed in 3.6.

Table 7. *Competing marine uses and conflict potential with aquaculture in Algeria*

| Marine Use | Nature of Interaction with Aquaculture | Conflict Potential |
|-----------------------------------|---|---------------------------|
| Artisanal & small-scale fisheries | Spatial overlap in coastal zones; gear entanglement; competition for fish biomass; restricted access to traditional grounds from farm exclusion zones | Very High |
| Industrial trawl fisheries | Overlap on trawlable grounds adjacent to farm zones; navigational constraints around cage installations | High |
| MPAs and protected habitats | Regulatory incompatibility within designation zones; buffer zone constraints on adjacent farm siting; Posidonia and coralligenous exclusion areas | High |
| Desalination plants | Thermal and chemical discharge affects water quality in | High |

| | | |
|--------------------------------------|--|-------------|
| | proposed AZA zones; competition for sheltered coastal locations | |
| Coastal tourism & bathing areas | Aesthetic and access concerns near cage farms; water quality perception; intense seasonal pressure in summer | Medium-High |
| Port infrastructure & shipping lanes | Navigational safety constraints restrict farm siting near port approaches and shipping corridors | Medium |
| Military restricted maritime zones | Classified restricted areas limit spatial options, particularly along the western coast | Low-Medium |
| Offshore oil & gas installations | Exclusion safety zones and pipe routes limit cage deployment in some western coastal sectors | Low-Medium |

3.2.6 Environmental sensitivities relevant to AZA siting

Algeria's coastal zone hosts several internationally and nationally recognised sensitive habitats that impose critical constraints on aquaculture site selection:

- *Posidonia oceanica* seagrass meadows: Provide essential nursery and feeding habitat for commercial fish species and significant carbon sequestration functions. Their mapping along the Algerian coast is currently incomplete, a major data gap for AZA designation.
- Coralligenous communities: Biodiverse, slow-growing habitats on hard substrates at 20–120 m depth, highly sensitive to sedimentation and physical disturbance.
- Coastal wetlands, lagoons, and estuaries: Including the ecologically important Réghaia and El Mellah lagoon systems, which serve as breeding and nursery areas for numerous marine species.
- MPAs and designated protection zones: Several marine areas have strict regulatory frameworks that preclude or restrict aquaculture within their boundaries and buffer zones.

The analysis conducted under MEDIGREEN reveals three active conflicts between existing or candidate AZA zones and environmental protection areas. First, less than 40% of the Algerian coastline has been surveyed for *Posidonia oceanica* distribution, meaning that several candidate AZA sites in the central cluster (Béjaïa-Jijel) cannot currently be confirmed as *Posidonia*-free, the most critical unresolved spatial conflict. Second, MPA buffer zones in the western cluster, particularly around Aïn Témouchent, overlap directly with zones of high aquaculture suitability, creating a tension between biodiversity protection and sector development that requires formal inter-ministerial resolution. Third, coralligenous and hard-substrate habitats in the central and eastern clusters are not yet integrated into the national aquaculture mapping portal, leaving a residual risk of inadvertent habitat disturbance during cage installation.

3.3 Contribution to European Green Deal objectives

The Algerian pilot directly addresses multiple EGD pillars. The following table maps Task 3.1 actions and outputs to specific EGD objectives:

Table 8. EGD pillars and Algeria pilot contribution

| EGD Pillar | Algeria Pilot Contribution | Key Actions under Task 3.1 |
|---|--|--|
| C. Sustainable seafood production | Development and designation of AZAs; capacity building on responsible aquaculture site selection | Spatial analysis; GIS mapping; stakeholder workshops |
| D. Biodiversity and ecosystem protection | Mapping MPAs and sensitive habitats (Posidonia, coralligenous, wetlands) as exclusion zones | GIS overlay; habitat sensitivity mapping |
| B. Climate change adaptation | Site selection criteria incorporating storm surge, sea level rise, and temperature projections | Vulnerability assessment; spatial modelling |
| E. Blue economy | Aquaculture as economic diversification, employment, and reduced dependence on wild capture | Economic analysis; value chain review |
| F. Zero pollution | Water quality monitoring and nutrient loading thresholds integrated into AZA criteria | EIA guidance; regulatory framework review |
| A. Climate change mitigation | Promotion of low-carbon aquaculture (shellfish, seaweed) and carbon sequestration | Policy dialogue; feasibility studies |

3.4 Stakeholder mapping

A comprehensive stakeholder mapping was conducted between April and June 2025, identifying all actors with interests in Algeria's coastal and marine space. The mapping informed both the spatial analysis methodology and the conflict resolution framework for the subsequent Task 3.2.

- **MADRP:** Ministry of Agriculture, Rural Development and Fisheries (MADRP): the DGPA, Principal regulatory authority for aquaculture; responsible for licensing, PNDA implementation, and DPA oversight.
- **Ministry of Environment:** Ministry of the Environment and Renewable Energies: Responsible for environmental impact assessment, MPA management, and enforcement of coastal environmental legislation.
- **Ministry of Defence:** Ministry of National Defence / Naval Command: Holds jurisdiction over maritime security and restricted naval operation zones, constraining siting options in certain coastal sectors.
- **CNRDPA:** National fisheries and aquaculture research centre; Algeria's lead MEDIGREEN partner, providing scientific expertise, GIS capacity, monitoring data, and the research-policy interface.
- **DPA:** Directions de la Pêche et de l'Aquaculture (DPAs): Regional-level agencies responsible for licensing, monitoring, and stakeholder relations at wilaya level along



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the coast.

- **Aquaculture operators:** Aquaculture operators and businesses: Farm operators seeking regulatory clarity and improved spatial governance as enablers of investment and sector growth.
- **Artisanal fishers:** Artisanal and small-scale fishing communities: Traditional coastal fishing communities whose customary access to and use of marine space may be affected by aquaculture expansion.
- **Tourism sector:** Coastal tourism sector: Hotels, marinas, and beach concessionaires whose business interests are sensitive to proximity to aquaculture installations.
- **Port authorities:** Port and maritime transport authorities: Responsible for shipping lane management and port approach safety, which impose spatial constraints on farm siting.

3.4.1 MEDIGREEN field survey of DPA agents: findings from 14 Coastal Wilayas

As part of the MEDIGREEN stakeholder mapping process under Task 3.1, CNRDPA conducted a structured field [survey](#)⁵ of the Directions de la Pêche et de l'Aquaculture (DPAs) across eleven coastal wilayas. The survey collected primary data on: (i) the concession attribution process, (ii) site selection criteria applied by DPA agents, (iii) awareness of the AZA concept, (iv) types and intensity of spatial conflicts observed locally, (v) availability of cartographic tools, and (vi) DPA recommendations for improving aquaculture governance. This survey constitutes a unique primary data source on the on-the-ground reality of aquaculture spatial planning in Algeria, complementing the CNRDPA production data and the DGPA regulatory framework analysis.

Key Cross-Wilaya findings

AZA concept awareness: Only 4 out of 14 surveyed wilayas (Oran, Tlemcen, Aïn Témouchent, Chlef) reported that DPA agents are familiar with the AZA concept. The remaining 7 wilayas (Mostaganem, Tizi Ouzou, Béjaïa, Jijel, Skikda, Annaba, and El Taref) reported no or only incipient knowledge of AZAs, a critical capacity gap given that these wilayas host a significant share of existing and planned aquaculture sites.

Site selection criteria: Across all surveyed wilayas, the five most consistently cited criteria for aquaculture site selection were: (1) water depth and current velocity; (2) absence of conflicts with other uses; (3) water quality; (4) proximity to a port; and (5) AZA availability. This convergence confirms the validity of the multi-criteria scoring framework used in the CNRDPA/MEDIGREEN spatial analysis, and grounds it in operational practice at the local level.

⁵ <https://ee.kobotoolbox.org/x/x7JcYUeE>

Process quality: The majority of wilayas (7 out of 14) described the concession attribution process as 'transparent and well-planned'. However, Oran, Chlef, and Béjaïa reported significant difficulties, including conflict sources and procedural inconsistencies, while Tizi Ouzou described the process as essentially non-existent or case-by-case, highlighting important territorial disparities in governance quality.

Cartographic tools: Access to spatial decision-support tools is uneven. Jijel is the only wilaya using a professional GIS platform (ArcGIS/QGIS). Most wilayas rely on Google Earth as an informal substitute, while Tlemcen uses MAXSEA (a nautical navigation tool). Seven wilayas (Oran, Chlef, Tipaza, Algiers, Boumerdes, Annaba, and El Taref) reported having no cartographic tools at all, which directly limits the quality of site selection and conflict assessment.

Marine aquaculture status: Marine aquaculture has not yet commenced in two eastern wilayas (El Taref and Annaba), despite concessions having been granted and AZAs identified in Annaba. This underlines the gap between regulatory/planning progress and actual operational development, a recurring theme across the survey.

Wilaya-by-Wilaya survey results

The table below presents the consolidated results of the MEDIGREEN DPAs field survey across all 14 coastal wilayas, including the nature of the concession attribution process, the site selection priorities, AZA awareness, conflict profiles by sector, available mapping tools, and key DPAs recommendations.

Table 9. MEDIGREEN field survey with DPAs

| Wilaya | Region | Concession Processes | AZA Awareness | Tourism Conflict | Artisanal Fisheries | Urban / Pollution | MPA Conflict | Mapping Tools | Conflict Nature | Key DPA Recommendations |
|----------------|--------|--------------------------------------|---------------|------------------|---------------------|-------------------|--------------|---------------|-------------------------|---|
| Oran | West | Difficult – conflict sources | Yes | High | None | None | None | No maps | Administrative | AZA management & regulation; sanitary approval; commercialisation; mussel spat supply |
| Tlemcen | West | Transparent & well planned | Yes | None | None | None | None | MAXSEA | Administrative | Classify aquaculture as a maritime activity; classified establishment permit; sanitary approval; fingerling reception in port |
| Ain Témouchent | West | Transparent / Complex but functional | Yes | Low | None | None | Critical | Google Earth | Spatial, Administrative | Devolve project validation; integrate the coastguard into the commission |
| Mostagan | West | Transp | No | None | None | None | None | Google | – | AZA management |

| | | | | | | | | | | | |
|-------------------|---------|--|------------|-----------------|-----------------|-------------|-------------|--------------|-------|---|--|
| em | | arent & well planned | | | | | | | Earth | | & regulation; combat illegal trawling |
| Chlef | West | Transparent / Complex / Difficult / Non-existent | Yes | Critical | Low | None | None | No maps | | <i>Spatial, Economic</i> | AZA management & regulation; improve social acceptability of aquaculture; classified establishment permit |
| Tipaza | Central | Case-by-case / Non-existent | No | None | Medium | Low | Low | Google Earth | | <i>Environmental, Administrative</i> | AZA decreed & regulated; mussel spat supply; local feed factory & hatchery; acceptability of local inputs |
| Algiers | Central | Case-by-case / Non-existent | No | None | Medium | Low | Low | Google Earth | | <i>Environmental, Administrative</i> | AZA decreed & regulated; mussel spat supply; local feed factory & hatchery; acceptability of local inputs |
| Tizi Ouzou | Central | Case-by-case / Non-existent | No | None | Medium | Low | Low | Google Earth | | <i>Environmental, Administrative</i> | AZA decreed & regulated; mussel spat supply; local feed factory & hatchery; acceptability of local inputs |
| Béjaïa | Central | Difficult - conflict sources | No | Low | Low | High | Low | Google Earth | | <i>Environmental, Administrative, Spatial</i> | AZA management; integrate sanitary plan; strengthen DPA monitoring capacity; update knowledge; review legal framework for non-compliance |
| Jijel | Central | Transparent & well planned | No | None | Medium | None | None | ArcGIS | | <i>Economic, Administrative, Spatial</i> | AZA decreed & regulated; DPA powers for concession cancellation; investor support via ANDPA; tackle false investors |
| Skikda | East | Transparent & well planned | No | Low | None | None | None | Google Earth | | <i>Spatial, Administrative, Economic</i> | AZA decreed & regulated; AZA zoning must account for coastal configuration; broaden wilaya commission composition |
| Annaba | East | Transparent & well planned | No | None | Critical | None | None | No maps | | <i>Spatial</i> | Investor awareness & support; AZA decreed & regulated; shellfish zone |

| | | | | | | | | | | | |
|-----------------|------|----------------------------|-----------|-------------|-------------|-------------|-------------|-------------|---------|--|---|
| | | | | | | | | | | classification; DPA veterinary sanitary approval; DPA staff training | |
| El Taref | East | Transparent & well planned | No | None | None | None | None | None | No maps | – | AZA decreed & regulated; locate AZA near the home port. Note: Marine aquaculture is not yet operational in El Taref |

Spatial conflict profile by coastal region

The survey reveals a clear regional differentiation in the nature and intensity of spatial conflicts:

- Western coast:** Western coast (Oran, Tlemcen, Aïn Témouchent, Mostaganem, Chlef): Tourism is the dominant conflict driver, reaching 'Critical' intensity in Chlef and 'High' in Oran, where summer coastal crowding and aesthetic concerns make aquaculture siting particularly contested. The conflict between aquaculture and Marine Protected Areas is flagged as 'Critical' in Aïn Témouchent, linked to the proximity of the Rachgoun MPA and Habibas Island. Conflicts with artisanal fisheries are absent or negligible across all western wilayas, suggesting that spatial separation between fishing grounds and cage farm locations is relatively well managed in this region.
- Central coast:** Central coast (Tipaza, Alger, Boumerdes, Tizi Ouzou, Béjaïa, Jijel): The central coast presents a more complex and multi-dimensional conflict profile. Artisanal fisheries conflicts are reported at medium intensity in Tizi Ouzou and Jijel. Urban/industrial pollution is flagged as a 'High' conflict in Algiers and Béjaïa, where proximity to the city and port raises water quality concerns that affect the suitability of aquaculture sites. Tizi Ouzou reports a documented intra-aquaculture conflict between shellfish culture and finfish cage farming recorded in 2025, the only such case reported in the survey. Béjaïa and Chlef also highlight the most acute governance challenges, with processes described as 'difficult' and numerous sources of conflict.
- Eastern coast:** Eastern coast (Skikda, Annaba, El Taref): Artisanal fisheries conflict reaches 'Critical' intensity in Annaba, the highest score in the survey for this conflict type, reflecting intense competition for coastal space around the Annaba Bay. Tourism and MPA conflicts are absent or negligible across the eastern wilayas. Notably, marine aquaculture has not yet started in Annaba or El Taref despite regulatory progress, suggesting that unresolved spatial and governance barriers are delaying operational development.

Consolidated DPAs recommendations

Across all 14 surveyed wilayas, DPA agents formulated recommendations that cluster into four thematic priorities, directly informing the policy recommendations in 3.7:



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- **AZA regulation and operationalisation:** The single most consistent demand across the survey, raised by 10 out of 14 wilayas, is for AZAs to be formally decreed, operationally regulated, and spatially delineated. This confirms that the legal gap identified in 3.6.2 is not just a national-level regulatory concern but a critical operational constraint felt acutely by the territorial management level.
- **Sanitary and health governance:** Wilayas across all three coastal regions highlighted the need for formal sanitary approval frameworks for DPA veterinary staff, sanitary integration in AZA plans, and structured commercialisation support reflecting the current absence of coherent market-to-farm governance linkages.
- **Investor support and DPAs capacity:** Annaba, Jijel, Boumerdes, Tipaza, Aïn Témouchent, Oran and Tlemcen explicitly called for more structured support frameworks for investors, DPA staff training, and strengthened DPA technical prerogatives (including powers to cancel non-performing concessions in Jijel). This demand underlines the need for capacity-building interventions planned under Task 3.2.
- **Aquaculture's legal and social status:** Tlemcen's call to formally classify aquaculture as a maritime activity and Chlef's recommendation to improve the social acceptability of aquaculture signal a broader need for strategic communication and a clearer positioning of aquaculture within Algeria's national blue economy framework.

3.5 Spatial analysis and AZA identification

The spatial analysis applied a multi-criteria GIS evaluation approach to identify candidate Allocated Zones for Aquaculture (AZAs) along the Algerian Mediterranean coast, in accordance with FAI/GFCM AZA designation guidelines. The methodology comprised three main components: suitability analysis, compatibility analysis, and conflict assessment.

3.5.1 Suitability analysis: multi-criteria scoring matrix

The suitability analysis evaluated physical, biological, and logistical conditions at each candidate site using a weighted multi-criteria approach. The scoring matrix below (Figure 1) presents the criteria, weights, and preliminary scores for the three main coastal clusters identified by CNRDPA:

| Criterion | Wt (%) | West (Oran–Mostaganem) | Central (Béjaïa–Jijel) | East (Annaba–El Tarf) | Min. Threshold | Data Availability |
|--------------------------------|--------|------------------------|------------------------|-----------------------|----------------|-------------------|
| Water depth (5–30 m) | 15% | 4 | 3 | 4 | ≥3/5 | High |
| Current velocity | 12% | 3 | 4 | 3 | ≥3/5 | Medium |
| Water temperature (°C) | 10% | 4 | 4 | 3 | ≥3/5 | High |
| Salinity (psu) | 8% | 4 | 4 | 4 | ≥3/5 | High |
| Dissolved oxygen | 10% | 3 | 4 | 3 | ≥3/5 | Medium |
| Distance from MPAs (km) | 10% | 3 | 2 | 3 | ≥3/5 | Medium |
| Posidonia / sensitive habitats | 12% | 2 | 3 | 4 | ≥3/5 | Low |
| Distance from ports (km) | 8% | 5 | 3 | 4 | ≥2/5 | High |
| Storm / wave exposure | 10% | 3 | 2 | 3 | ≥3/5 | Medium |
| Distance from desalination | 5% | 2 | 4 | 4 | ≥2/5 | Medium |
| Weighted Score | | 3.32 | 3.25 | 3.48 | | |

Score legend: 1 = Very low (red) /2 = Low (amber) /3 = Medium (yellow) /4 = High (green) /5 = Very high (dark green)

Figure 1. Multi-Criteria Suitability Analysis Matrix for Marine Aquaculture Site Selection in Algeria.

The eastern coastal cluster (Annaba–El Tarf) scores highest overall (3.48/5), benefiting from relatively lower tourism pressure, existing aquaculture infrastructure, and sheltered lagoon environments. The western cluster (Oran–Mostaganem) scores 3.32/5, with advantages in port proximity and bathymetric suitability, partially offset by higher desalination plant interaction and artisanal fishing pressure. The central cluster (Tipaza, Algiers, Boumerdes, Béjaïa–Jijel) achieves 3.25/5, with good hydrodynamic conditions but constraints from rocky coastline, *Posidonia* habitat presence, and high fishing activity.

The criterion carrying the greatest weight in constraining site selection is the absence of *Posidonia oceanica* meadows and other sensitive habitats (12% weight), for which data availability is currently assessed as “Low”, representing the single largest bottleneck in refining the spatial analysis. Storm and wave exposure also emerges as a significant constraint, particularly for the central coast, where swell exposure limits the deployment of standard floating cage structures.



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3.5.2 Compatibility analysis and exclusion zones

The compatibility analysis overlaid suitability outputs with spatial constraints. The following categories were applied as exclusion or buffer zones:

- Marine Protected Areas (MPAs) and designated buffer zones, where aquaculture is prohibited or subject to strict environmental assessment;
- *Posidonia oceanica* meadows and coralligenous habitats—whether formally designated or mapped by CNRDPA survey data are treated as unconditional exclusion zones;
- Navigational safety zones, shipping lanes, and port approach channels, where interference with maritime traffic is unacceptable;
- Military restricted maritime areas, with precautionary buffers applied around classified zones;
- Designated bathing zones, beach concession areas, and tourism corridors, where co-existence with aquaculture is considered incompatible.

The application of these exclusion and buffer zones to the three coastal clusters produced the following key results. In the western cluster (Oran–Mostaganem), about 35–40% of the nearshore zone within 3 nautical miles is excluded from AZA designation, primarily due to artisanal fishing ground overlap, desalination plant proximity, and tourism corridor restrictions. In the central cluster (Béjaïa–Jijel), the exclusion rate reaches 45–50%, driven primarily by the distribution of *Posidonia* meadows and MPA buffer zones around Cap Bougaroun and the Béjaïa Bay protected areas. In the eastern cluster (Annaba–El Tarf), compatible zones represent approximately 55–60% of the analysed coastal strip, benefiting from lower tourism pressure and fewer designated MPAs, though military restricted zones introduce localised uncertainty along the Skikda coastline. Across all three clusters, the compatibility analysis confirms that the most viable candidate AZA sites are concentrated in protected bays (15 to 30 m), at a minimum distance of 500 metres from artisanal fishing anchorages and 2 kilometres from MPA boundaries. These results are illustrated in Figure 2.

3.5.3 Candidate AZA Zones

Based on the combined suitability and compatibility analysis, candidate AZA zones were identified across three main coastal clusters. The following map provides a simulation of the candidate AZA locations (Figure 2), MPA positions (Figure 3), conflict hotspots, and bathymetric context along the Algerian Mediterranean coast:

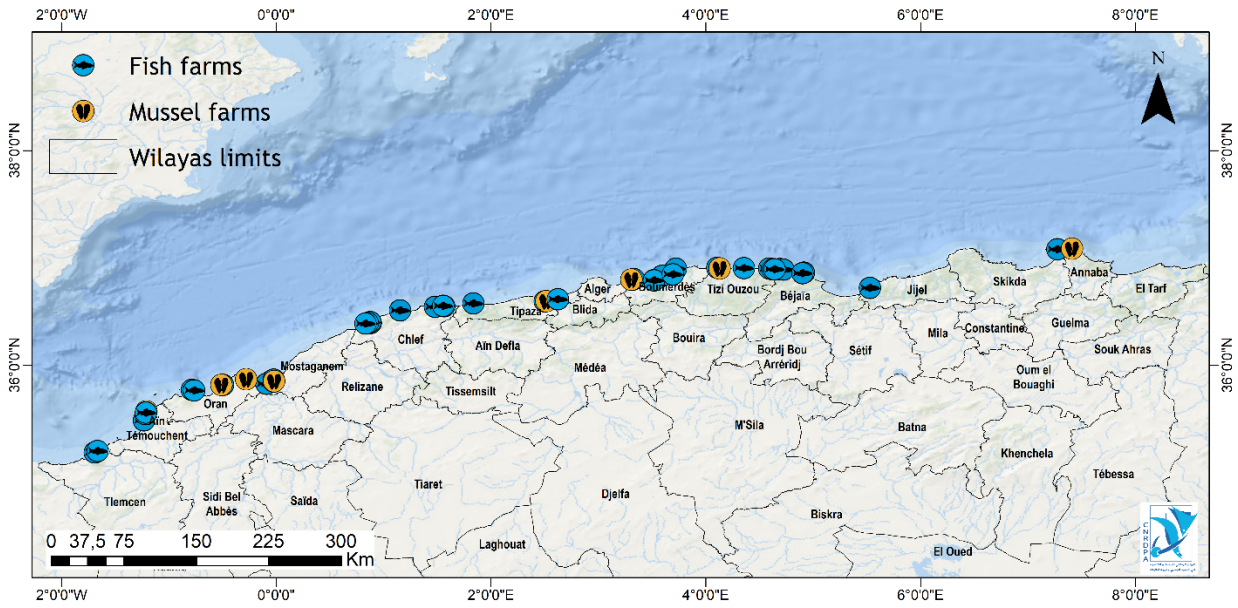


Figure 2. Allocated Zones for Aquaculture (AZAs) along the Algeria coast. Note: This map is generated based on CNRDPA project: <https://aquamap-algerie.cdda.dz/>

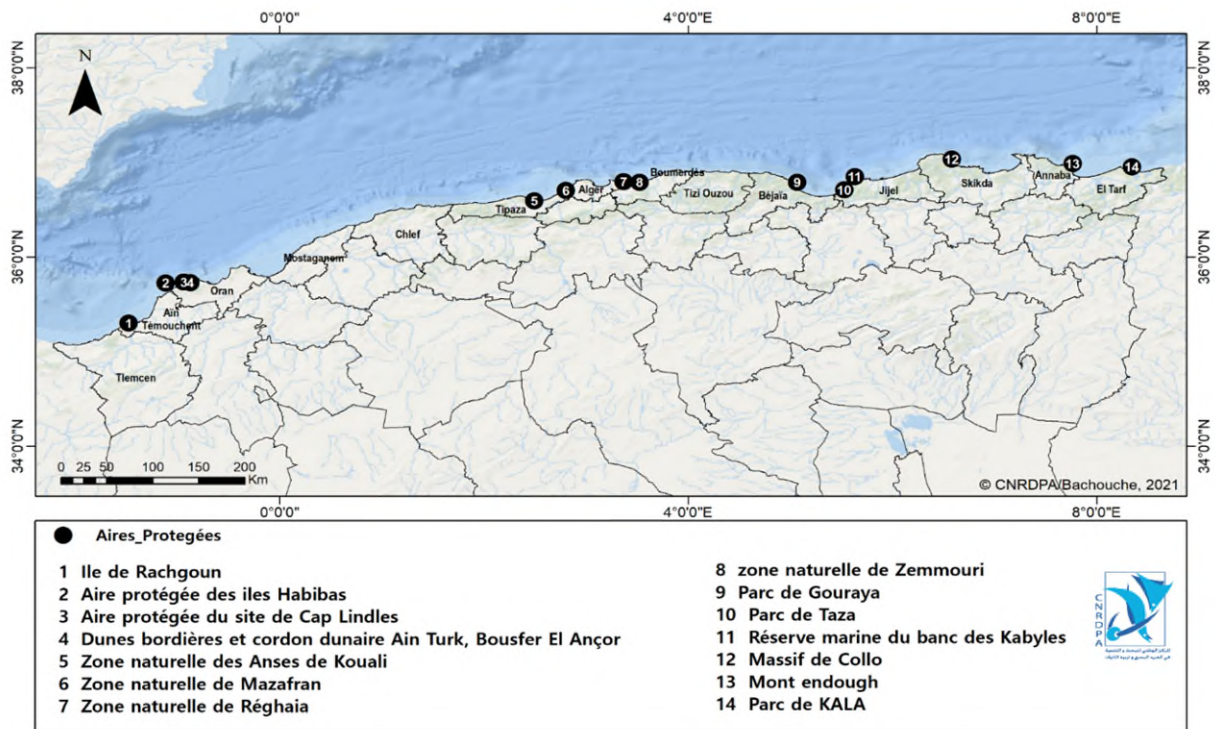


Figure 3. Marine Protected Areas in Algeria

Table 10. Multi-criteria suitability analysis matrix – candidate AZA coastal clusters

| Coastal Cluster | Main Wilayas | Key Opportunities | Main Constraints | Suitability Score |
|--------------------------------|---|--|---|-------------------|
| Western coast | Oran, Mostaganem, Aïn Témouchent | Sheltered bays; existing port infrastructure; strong investor interest; access to cold-chain logistics | Tourism pressure; artisanal fishing ground overlap; desalination plant proximity; wind and swell exposure | 3.32/5 |
| Central coast (Kabylie) | Tipaza, Algiers, Boumerdes, Béjaïa, Jijel, Tizi Ouzou | Diverse coastal topography; existing CNRDPA research presence; some sheltered coves | High fishing activity; rocky coastline limiting mooring; Posidonia presence; data scarcity | 3.25/5 |
| Eastern coast | Annaba, El Tarf, Skikda | Existing licensed aquaculture operations; sheltered coastal lagoons; lower tourism pressure; cross-border proximity to Tunisia | Industrial port activities; military zone restrictions; Posidonia mapping gaps | 3.48/5 |

3.6 Key findings and identified challenges

3.6.1 Spatial conflicts: conflict of users vs. the aquaculture sector

The spatial analysis identified six discrete zones of active or high-potential conflict between existing marine space users and aquaculture operations. These conflict zones, mapped by CNRDPA using an overlay analysis of marine use data, are described in the table and conflict matrix below (Table 11). Figure 4 shows the six conflicts identified with the aquaculture sector.

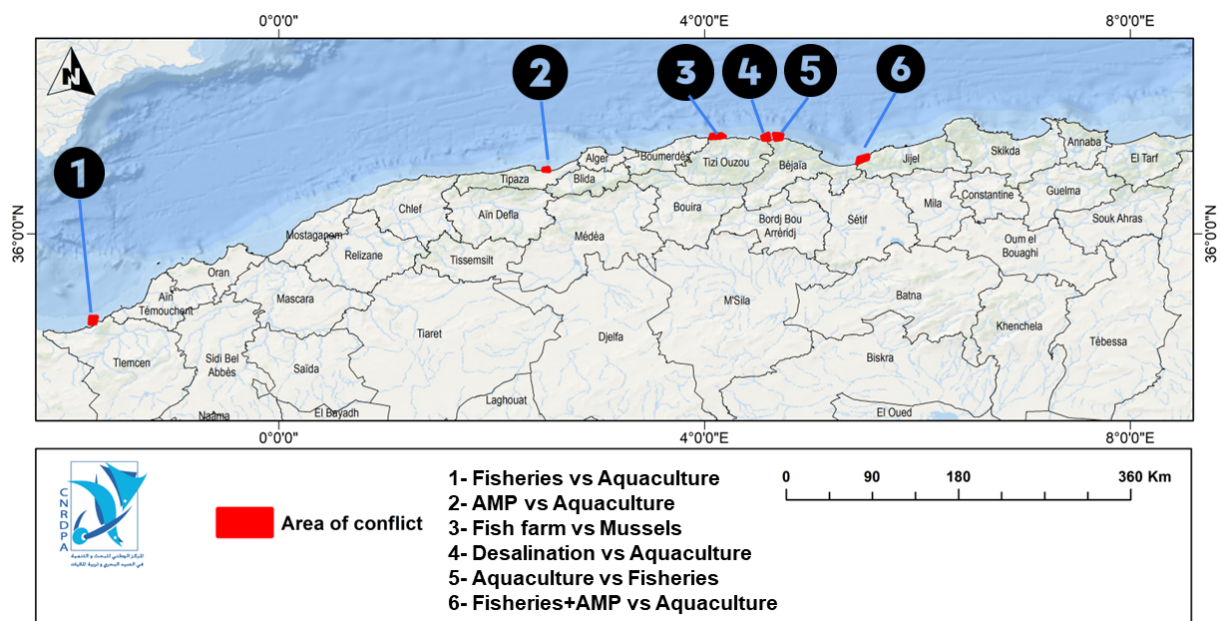


Figure 4. Conflicts between aquaculture and other maritime uses

Table 11. Six-zone spatial conflict assessment

| # | Location | Type of Conflict | Main Actors Involved | Intensity |
|---|-----------------------------------|--|---|-----------|
| 1 | Aïn Témouchent (Western coast) | Fisheries vs. Aquaculture: spatial overlap between finfish cage farms and artisanal fishing grounds; gear entanglement reported | Artisanal fishing communities; aquaculture operators | Very High |
| 2 | Tipaza / Alger Bay (Central-West) | MPA vs. Aquaculture: proposed aquaculture expansion zones overlap with Marine Protected Area boundaries and buffer zones | MPA managers; Ministry of Environment; aquaculture investors | High |
| 3 | Boumerdès (Central coast) | Fish farm vs. Mussels: inter-sector aquaculture conflict between existing finfish cage operators and prospective shellfish (mussel) longline cultivators competing for the same sheltered water body | Finfish operators; shellfish producers; DPA | High |
| 4 | Béjaïa Bay (Central coast) | Desalination vs. Aquaculture: thermal and chemical effluent from coastal desalination plants impairs water quality within proposed aquaculture development zones | Algerian Water Authority; aquaculture operators; environmental regulators | High |
| 5 | Jijel (Central-East coast) | Aquaculture vs. Fisheries: reverse conflict dynamic where established aquaculture installations create exclusion zones that restrict artisanal fishing access to traditional grounds | Artisanal fishers; cage farm operators; DPA Jijel | Very High |
| 6 | Skikda region (Eastern coast) | Fisheries + MPA vs. Aquaculture: compound conflict combining artisanal fishing overlap with MPA buffer zone constraints on a proposed multi-operator aquaculture development site | Artisanal fishers; MPA managers; CNRDPA; Ministry of Environment | High |

The following conflict matrix synthesises these interactions across all relevant marine user categories and aquaculture types, enabling a comparative assessment of conflict intensity across the full range of spatial interactions (Figure 5).

The conflict matrix reveals that artisanal fisheries and desalination plants represent the two user categories with the highest cumulative conflict potential with aquaculture development. Finfish cage culture is the aquaculture type generating the highest number and intensity of conflicts, a finding that underscores the need for spatial separation, buffer zones, and enforceable regulatory boundaries as part of the AZA designation process. Seaweed and macroalgae cultivation, by contrast, presents the lowest conflict profile across almost all user categories, highlighting the sector as a strategically important future pathway for low-conflict coastal aquaculture development in Algeria.

| Marine user \ Aquaculture type | Finfish cage culture | Shellfish (mussels/oysters) | Seaweed / macroalgae | IMTA systems | Offshore cages |
|--------------------------------|----------------------|-----------------------------|----------------------|--------------|----------------|
| Artisanal fisheries | Critical | High | Low | High | High |
| Industrial fisheries | High | Medium | Low | Medium | Very high |
| MPAs & habitat zones | High | Medium | Low | Medium | Medium |
| Coastal tourism | High | Medium | Low | Medium | Low |
| Desalination plants | Very high | High | Medium | High | Medium |
| Port / shipping lanes | Medium | Low | Low | Low | High |
| Military zones | Medium | Low | None | Low | Medium |
| Oil & gas platforms | Low | Low | None | Low | High |

Conflict levels: 0 – None | 1 – Low | 2 – Medium | 3 – High | 4 – Very high | 5 – Critical (dark red cell)

Figure 5. Spatial Conflict Matrix: Marine Users vs Aquaculture Sectors in Algeria. Conflict levels assessed through GIS overlay and stakeholder consultation.



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The conflict matrix was constructed through a three-step methodology. First, GIS spatial overlay analysis was used to identify physical overlaps between mapped marine uses (artisanal fishing grounds, MPA boundaries, shipping lanes, desalination plant buffers, military zones, tourism activities) and candidate aquaculture zone locations along the Algerian coast. Second, the results of the MEDIGREEN field survey conducted across 11 coastal wilayas provided primary evidence on perceived conflict intensity at the local level, as reported by DPA agents. Third, expert assessment by CNRDPA researchers, validated against documented incidents and stakeholder consultation, was used to assign a final conflict-intensity score from None to Critical to each marine user-aquaculture type combination. The matrix should therefore be read as a structured expert judgement tool, grounded in spatial data and field evidence, rather than a statistically derived conflict index.

3.6.2 Governance gaps

The review of Algeria's legal and institutional framework for marine spatial management identified several critical governance gaps that constrain the effective implementation of MSP-based aquaculture governance. The following analysis presents both the identified gaps and the recommended corrective actions, illustrated in the governance assessment diagram below (Figure 6).

Absence of a dedicated MSP legal framework: Algeria currently lacks a comprehensive Maritime Spatial Planning law or decree. Marine space governance is fragmented across a patchwork of sectoral legislation, including the coastal protection law (Law 02-02), the fisheries law, the water law, the ports law, and environmental impact assessment regulations, administered by at least four different ministries with overlapping and sometimes conflicting jurisdictions. This fragmentation creates significant implementation gaps: decisions made by one ministry may contradict or undermine those of another, and there is no formal mechanism for resolving inter-ministerial conflicts in the marine domain.

Lack of formal legal status for Allocated Zones for Aquaculture (AZAs): The concept of AZA, a spatially defined zone designated exclusively or primarily for aquaculture development, with associated rights, responsibilities, and management rules, has no formal legal recognition in Algerian maritime law. As a result, any zones identified through the MEDIGREEN spatial analysis cannot currently be enforced as binding spatial plans. Aquaculture operators receive individual farm licences, but without any spatial planning framework governing their cumulative footprint, spatial distribution, or compatibility with neighbouring uses.

Absence of inter-ministerial coordination for marine governance: Marine space management in Algeria involves the Ministry of Agriculture (MADR), the Ministry of the Environment, the Ministry of National Defense, and the Ministry of Transport (ports and shipping). There is no formal inter-ministerial committee, council, or coordination platform dedicated to marine spatial governance. The resulting administrative silos mean that sectoral decisions, on aquaculture licenses, MPA boundaries, port expansion, desalination

plant siting, and military zone delineation, are made independently, without cross-sectoral impact assessment.

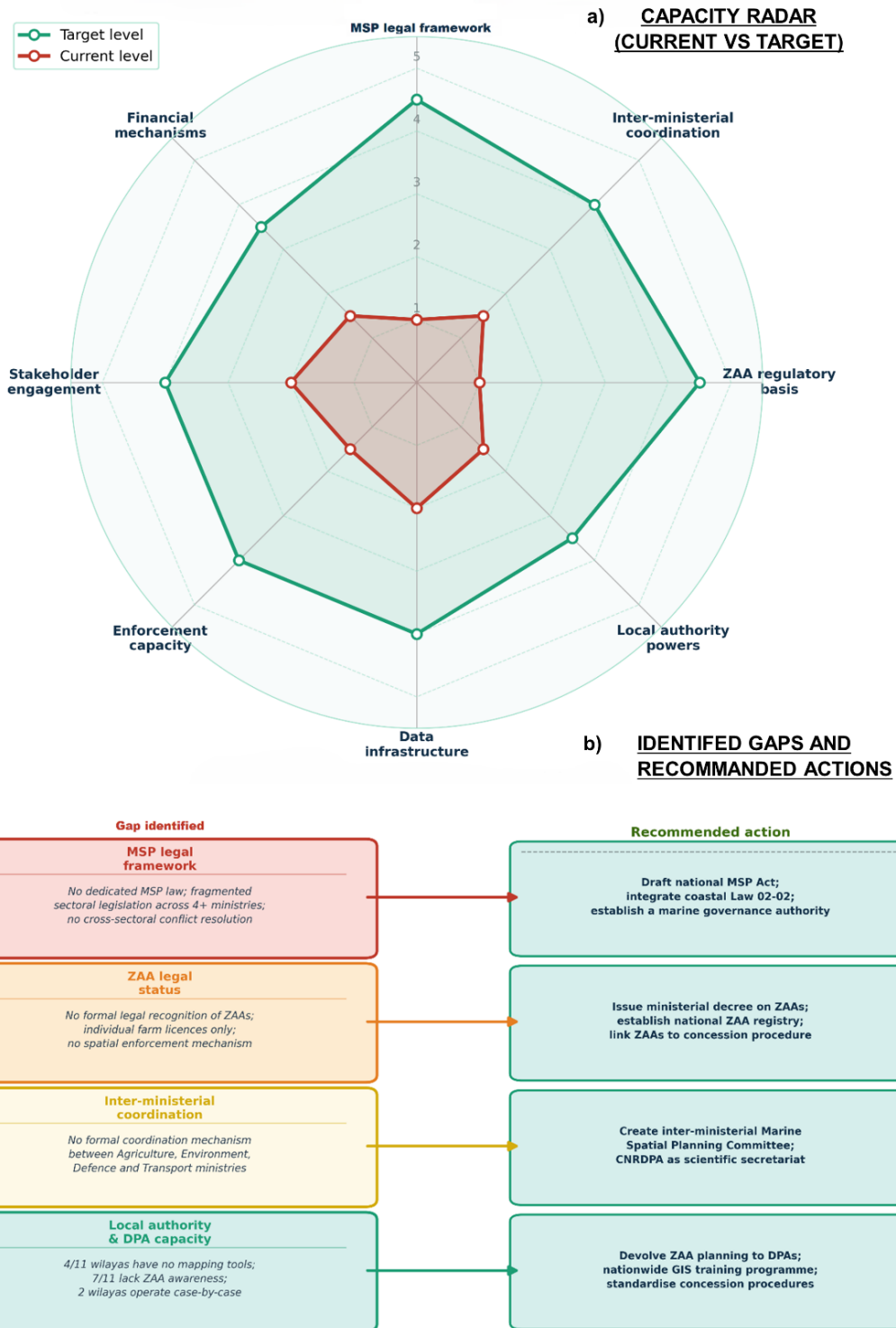


Figure 6. Governance capacity assessment and key gaps-Algeria MSP/Aquaculture. Current institutional capacity vs required target.



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Limited jurisdiction of regional and local authorities: Regional-level authorities (wilaya governments) and municipal bodies have limited formal powers in the marine domain. The regional directions of fisheries and aquaculture (DPAs) act as implementation arms of MADRP but have restricted autonomous decision-making capacity, particularly with respect to spatial planning, conflict resolution, and cross-sectoral coordination at the local level. This constraint reduces the effectiveness of bottom-up governance and local conflict mediation.

3.6.3 Data limitations

The spatial analysis was constrained by significant data gaps across multiple thematic domains. The data availability assessment below in Figure 7 illustrates the current state of key data sets required for robust MSP-based aquaculture planning in Algeria.

***Posidonia oceanica* and sensitive habitat mapping:** This is the most critical single data gap for the AZA designation process. Available *Posidonia* maps cover less than 40% of the Algerian coastline and are based on surveys of varying age and methodology. Without comprehensive, current habitat maps, it is impossible to guarantee that candidate AZA sites do not overlap with protected or sensitive seabed habitats. CNRDPA has initiated a targeted survey programme, but completion will require significant additional resources and time.

Systematic oceanographic monitoring data: Real-time and historical oceanographic monitoring data (water temperature, salinity, dissolved oxygen, current velocity, and wave heights) at candidate aquaculture sites is sparse and unevenly distributed along the coast. Most existing monitoring is carried out at research stations or meteorological points that do not coincide with priority AZA candidate zones. This limits the precision of biophysical suitability scoring and increases environmental risk in site selection.

Georeferenced artisanal fishing effort data: Artisanal fishing grounds are currently mapped only partially and without systematic georeferencing. Most data on fishing effort distribution derives from harbour statistics and self-reporting, without spatial precision. The absence of fine-scale fishing effort maps means that conflict intensity assessments are based on qualitative stakeholder inputs rather than quantitative spatial data, reducing the defensibility of AZA boundary decisions in potential disputes.

Military restricted zone spatial data: The precise boundaries of military restricted maritime areas along the Algerian coast are classified and not publicly available. This creates a significant planning uncertainty, as aquaculture developers and regulators cannot determine with confidence whether proposed sites fall within or adjacent to restricted zones. Formal data-sharing arrangements between the Ministry of National Defense and MADRP/CNRDPA are needed to address this gap.

a) Data Availability Assessment for MSP-Aquaculture Planning — Algeria

| | Coverage (% coastline) | Spatial Resolution | Temporal Update | Open Access |
|--|------------------------|--------------------|-----------------|-------------|
| Bathymetric data | Good | Moderate | Moderate | Moderate |
| Oceanographic monitoring (currents, temp., DO) | Poor | Poor | Poor | Poor |
| Posidonia / sensitive habitat maps | Poor | Very poor | Very poor | Poor |
| Artisanal fishing grounds (georeferenced) | Very poor | Very poor | Very poor | Very poor |
| MPA boundaries | Moderate | Moderate | Moderate | Poor |
| Military restricted zones | Very poor | Very poor | Very poor | Very poor |
| Water quality monitoring | Poor | Poor | Poor | Poor |
| Aquaculture production data | Moderate | Poor | Moderate | Poor |

Data availability rating

■ Very poor
 ■ Poor
 ■ Moderate
 ■ Good

b) Capacity Building Needs by Thematic Area

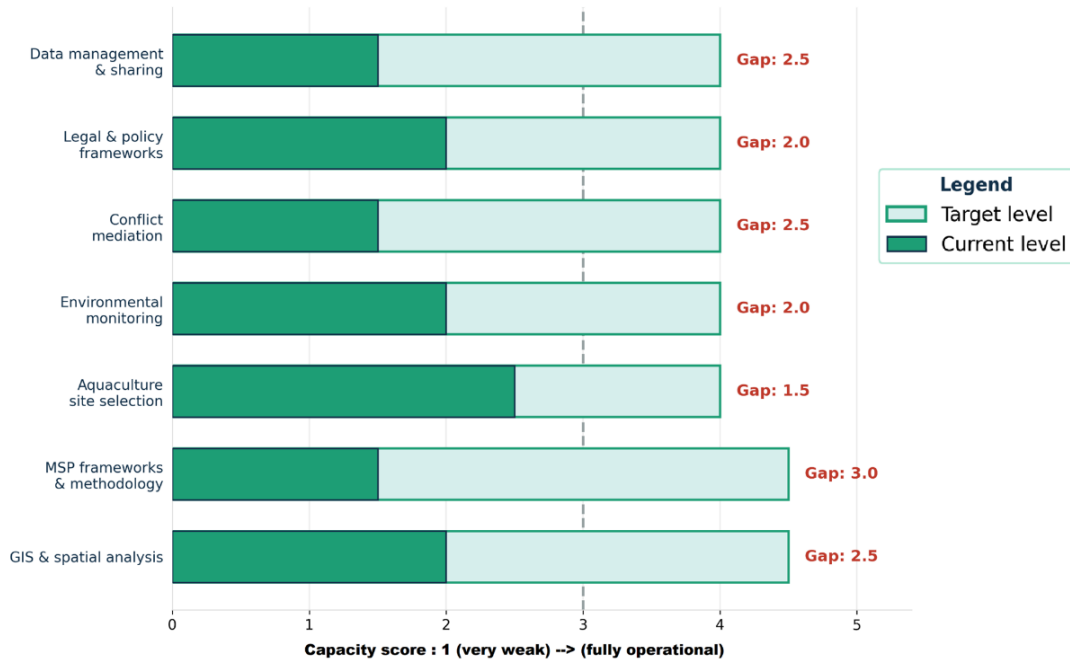


Figure 7. Data availability assessment and capacity building needs for MSP-Aquaculture planning in Algeria.



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3.6.4 Capacity needs

The stakeholder mapping and consultation process confirmed that significant capacity building is required at multiple levels of Algeria's marine governance system. The capacity bar chart in Figure 5 (above) illustrates current versus target capacity levels across seven thematic areas.

GIS and spatial analysis capacity: CNRDPA has demonstrated strong GIS capacity through the MEDIGREEN spatial analysis, but this expertise is concentrated in a small core team. Regional DPAs lack GIS capacity almost entirely, meaning that the routine updating and monitoring of spatial plans and AZA boundaries cannot currently be decentralised. Investment in GIS software, data infrastructure, and staff training at the regional level is a priority.

MSP frameworks and methodology: Awareness of MSP concepts, tools, and international best practices is limited among national planners and policymakers beyond CNRDPA and a small number of Ministry officials who have engaged with MEDIGREEN. A structured national training programme on MSP, covering planning cycles, stakeholder engagement, strategic environmental assessment, and monitoring and evaluation, is needed to build the institutional base for future MSP implementation.

Conflict mediation and multi-stakeholder dialogue: The fisheries-aquaculture conflict, in particular, requires skilled mediators with domain expertise in both marine resource use and community engagement. Existing regulatory staff in DPAs and MADRP are not trained in conflict mediation methodologies, and there are currently no standard procedures or guidelines for mediating marine space use conflicts in the Algerian context. Development of conflict resolution protocols, informed by Mediterranean best practices and adapted to Algerian institutional realities, is a key deliverable for Task 3.2.

Legal and policy framework literacy: Awareness of the EGD framework and its policy implications for national aquaculture and MSP regulation is currently limited to CNRDPA and project-engaged officials. Broader dissemination of the MEDIGREEN findings, through policy briefs, ministerial workshops, and bilateral government-to-government exchanges, is needed to embed EGD-aligned thinking within Algeria's marine governance institutions at a level sufficient to drive legislative and regulatory reform.

3.7 Policy recommendations

The following recommendations were formulated on the basis of three complementary inputs: the spatial conflict assessment conducted by CNRDPA; the MEDIGREEN DPA field survey across 11 coastal wilayas, which provided direct evidence on governance gaps, data deficiencies, and institutional bottlenecks at the regional level and the governance capacity assessment drawing on CNRDPA institutional analysis and expert judgment. They are addressed primarily to MADRP/DGPA and the relevant DPAs and are structured around four priority areas: ZAA, inter-sector coordination, data collection and capacity building.



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3.7.1 AZA institutionalisation

- Develop a dedicated legal or regulatory instrument (executive decree or ministerial order) establishing AZAs as binding spatial management tools with enforceable boundaries and conditions of use;
- Establish a national-level AZA Designation Committee with representation from MADRP/DGPA, Ministry of Environment, CNRDPA, and relevant DPAs to oversee the full designation, monitoring, and review cycle;
- Integrate candidate AZA maps into coastal zone management plans and regional development frameworks at the wilaya level;
- Develop standard environmental impact assessment procedures for AZA sites, aligned with FAO Technical Guidelines for Responsible Fisheries and GFCM AZA guidelines.

3.7.2 Inter-sector coordination

- Establish a formal Inter-Ministerial Committee on Marine Spatial Planning, bringing together Agriculture, Environment, Defense, and Transport ministries, with CNRDPA as scientific secretariat;
- Develop a national MSP framework building on existing coastal zone legislation (Law 02-02) and international commitments under UNCLOS and the Barcelona Convention;
- Create formal data-sharing protocols between the Ministry of National Defense and MADRP/DGPA/CNRDPA to enable the integration of restricted zone boundaries into planning workflows.

3.7.3 Data collection priorities

- Commission a comprehensive *Posidonia oceanica* and sensitive habitat survey programme covering the full Algerian coast, to be hosted and maintained by CNRDPA;
- Develop a national marine spatial data portal enabling data sharing between ministries, regional authorities, and the public;
- Deploy additional oceanographic monitoring buoys and sensors at priority AZA candidate sites to fill environmental data gaps.

3.7.4 Capacity building

- Implement a national training programme on MSP methodology, GIS tools, and EGD policy for MADRP/DGPA, DPAs, and CNRDPA staff;
- Develop conflict resolution guidelines for coastal zone managers, drawing on Mediterranean best practices;



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4. ALBANIA: INTEGRATING SMALL-SCALE and RECREATIONAL FISHERIES INTO MSP

4.1 National context

4.1.1 The fisheries sector

The fisheries sector in Albania, although relatively small, plays an important socio-economic role, particularly in coastal and remote areas. The country has rich water resources and a coastline of 476 km, with fishing activities taking place within its territorial waters (up to 12 nautical miles). Most fishing, however, is concentrated on the continental shelf, which extends up to 25 miles in the northern Adriatic, but only 2–4 miles along the Ionian coast (Figure 8).

Albanian coastal waters are characterised by a high diversity of commercially valuable species. Key resources include small pelagics such as anchovy and sardine, large pelagics such as tuna, and demersal species including European hake, red mullet, striped mullet, sole, and cuttlefish. The sector comprises industrial (professional) and small-scale⁶ fisheries, both of which are classified as commercial fisheries under national legislation. Industrial fishing relies on trawling and purse seining, while small-scale fisheries use more selective gear such as hooks, trammel nets and gillnets.

In 2023, the Albanian fleet included 811 licensed vessels, mainly operating from four ports—Shëngjin, Durrës, Vlorë and Saranda—with Durrës as the main hub. Of these, at least 70% were gillnetters associated with SSF. Annual marine catches amount to approximately 7,000 tonnes, including species such as deep-water rose shrimp, anchovy, hake, sardine and red mullet. Small-scale fisheries contribute around 900 tonnes per year, according to official statistics.

⁶ Within this report, the term “small-scale fisheries (SSF)” is used as equivalent to artisanal fisheries, as commonly understood in the Albanian context



Figure 8. Fishing areas in Albania

4.1.2 Legal and regulatory framework

The current legal framework governing fisheries and aquaculture in Albania reflects a broader transition from a centrally planned system to a market-based economy in the early 1990s, which required substantial sectoral reform and the introduction of modern fisheries management approaches. The foundations of this framework were established with Law No. 7908 (1995) “On Fisheries and Aquaculture”, largely based on the principles of the FAO Code of Conduct for Responsible Fisheries. Building on this initial framework, subsequent legislation has progressively aligned the sector with EU standards and international best practices, as outlined in the table below (Table 12).

Table 12. Overview of key legislative documents related to the fisheries sector

| Legal Text | Main Purpose | Key Content |
|---|---|--|
| Law No. 64/2012 (31 May 2012) “On Fisheries” | Framework law for fisheries management | Establishes the legal basis for fisheries management in Albania; developed with EU technical and financial support; aligns with key EU regulations on control, data collection, IUU fishing, and sustainable exploitation of marine resources |
| DCM No. 301 (10 April 2013) | Fisheries data collection and scientific support | Establishes rules for data collection, management and use in the fisheries sector; supports scientific advice for national fisheries policy; based on (now repealed) EU Regulation 199/2008 |
| DCM No. 256 (24 April 2019) | Updated fisheries data framework | Provides full alignment with Regulation (EU) 2017/1004 and Implementing Decision (EU) 2016/1251; strengthens systems for data collection, management and scientific support |
| DCM No. 302 (10 April 2013) | Control of illegal fishing (IUU) | Establishes a system to prevent, deter and eliminate illegal, unreported and unregulated fishing; introduces catch certification scheme; aligned with EU Regulations 1005/2008 and 1010/2009 |
| DCM No. 402 (8 May 2013) | Sustainable exploitation of fisheries resources | Sets management measures for sustainable use of marine resources in the Mediterranean; aligned with EU Regulation 1967/2006 |
| DCM No. 407 (8 May 2013) | Fisheries control and compliance system | Establishes control system to ensure compliance with fisheries rules; aligned with EU Regulations 1224/2009 and 404/2011 |
| Order No. 149 (31 March 2022) – Ministry of Agriculture and Rural Development | Implementation of fisheries law and technical conservation measures | Sets detailed operational rules: spatial restrictions (e.g. bans near river mouths, lagoons, and around Sazan Island and Karaburun–Sazan National Marine Park); limits on gear (net length, hook numbers, mesh size); depth restrictions (10 m Adriatic, 20 m Ionian); temporal rules for artisanal fishing (sunset–sunrise use of gear) |

Since their adoption, the Decisions of the Council of Ministers (DCMs) have been regularly updated, amended or repealed to reflect changes in EU legislation. Similarly, the Law on Fisheries has been amended several times to align with evolving requirements from



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Regional Fisheries Management Organisations and the EU accession process.

The DCMs provide the detailed technical provisions not covered in Law No. 64/2012, ensuring full operational alignment with EU rules. As a Contracting Party to the GFCM and an EU candidate country, Albania has demonstrated a high level of readiness to implement both GFCM recommendations and EU regulations, resulting in a strong degree of legislative alignment.

4.2 Current state of small-scale fisheries

Small-scale fisheries represent the oldest and most socially significant segment of the sector in Albania, involving the largest number of vessels and fishers. However, the sector remains poorly documented, with significant gaps in data across most of its components, and is still the least regulated and formalised part of the fleet.

This situation is largely rooted in historical developments. Prior to the 1990s, artisanal fishing was limited to a few vessels operating from the main ports—Durrës, Vlorë, Shëngjin and Saranda—while the rest of the coastline was largely inaccessible due to border restrictions. Following the transition to a market economy, the opening of coastal areas, combined with high unemployment, led to a rapid and largely unregulated expansion of artisanal fishing, often as a subsistence activity.

Over the past two decades, efforts have been made to formalise the sector through legal and regulatory measures. A key step was the moratorium on small vessels (2005–2012), which encouraged the registration and licensing of boats and marked a gradual shift towards more structured management of small-scale fisheries.

Despite a relatively comprehensive legal framework, the sector remains only partially documented, with notable gaps in data and monitoring.

Fleet size and structure

Current estimates indicate a total of approximately 1,015 SSF vessels along the Albanian coast. Of these, 581 vessels are licensed, while a significant number (around 43%) operate without valid licences. This suggests that the actual size of the SSF fleet is substantially higher than officially reported figures (e.g., 353 vessels reported to the GFCM), indicating persistent informality within the sector.

The fleet is dominated by very small vessels:

- over 65% are between 4–6 m in length,
- a smaller share (approx. 30%) ranges from 6–12 m,
- very few vessels are below 4 m.

Boats are typically constructed from wood, plastic, or fiberglass, with engines ranging from low to moderate power, reflecting their nearshore operational range.



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Spatial distribution

The sector operates predominantly in coastal waters, with fishing activities legally limited to within 3 nautical miles from the shoreline, with vessels distributed along the entire coastline, though unevenly (Figure 9). The highest concentration is in the Vlorë region (over one-third of the fleet), followed by Lezhë and Durrës. Unlike industrial fisheries, SSF activities are highly dispersed, with numerous informal landing sites, beaches, and small docking areas rather than centralised ports.

Fishing practices

SSF relies on a limited number of selective fishing gears, mainly:

- trammel nets (by far the most prevalent),
- gillnets,
- hook lines.

Fishers often alternate gear seasonally, adapting to species availability. The sector is characterised by high fishing effort, with vessels operating approximately 190–210 days per year—the highest among all fleet segments.

Catch volumes and composition

Official data indicate annual SSF catches ranging between 700 and 1,000 tons, representing roughly 10% of total national marine catches. However, field observations and stakeholder consultations suggest that actual catches may be at least 25% higher, reflecting underreporting.

SSF targets a diverse range of commercially valuable species, including:

- Sparidae (sea bream) and sea bass (together accounting for over 30%),
- mullets, cuttlefish, and caramote prawn,
- hake and red mullet,
- a significant share of mixed (“miscellaneous”) species.

This diversity contributes to both market resilience and ecological pressure in nearshore areas.



Figure 9. Distribution of SSF along the Albanian coastline, within 3NM zone



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Economic relevance

SSF represents a modest but locally significant component of the blue economy. While the fisheries and aquaculture sector as a whole contributes up to around 1% of GDP, it plays an important role in supporting coastal livelihoods, local markets and food supply chains.

Available estimates indicate that the total value of fish and seafood production has increased from approximately USD 53 million in 2017 to around USD 67 million (approx. EUR 62 million) in recent years. Within this, SSF is estimated to account for roughly 13% of production value, in line with its share in total catches. At the local level, SSF generates an estimated annual income of at least €8 million, with relatively high market prices for certain species (up to €20–25/kg), contributing directly to household income and small-scale economic activity.

Although modest in macroeconomic terms, SSF remains socially and economically important, particularly in coastal communities. Its contribution is likely underestimated due to informal activity and underreporting of catches. In the context of Albania's emerging blue economy policy framework—including the draft Intersectoral Strategy for the Blue Economy – the sector is increasingly recognised for its potential to support sustainable coastal development, alongside more dominant sectors such as tourism (approx. 10% of GDP) and maritime transport (approx. 3% of GDP).

4.3 Current state of recreational and leisure fisheries

Recreational and leisure fisheries in Albania remain an emerging but increasingly visible sector, comprising three main segments: recreational fishing, fishing tourism, and sport fishing.

Recreational fishing is primarily practised along the coastal areas of Durrës, Vlorë, Saranda and Shëngjin. It is largely informal, with no reliable data on the number of participants. Activities mainly target species such as sea bass, mullets and Sparidae, using simple gear (hooks), while spearfishing is also practised but similarly lacks monitoring data.

Fishing tourism has grown in recent years, driven by the expansion of coastal tourism. Guided fishing trips, boat rentals and related services are increasingly offered, particularly in high-tourism areas such as Durrës, Vlorë Bay and the Saranda-Ksamil area. Although still underdeveloped and poorly documented, this segment contributes to local economic diversification and small business development.

Sport fishing is more structured and organised under the Albanian Sport Fishing Federation, which coordinates competitions, training and international participation. Several clubs operate under its umbrella, with regular national events held annually.

Overall, while recreational and leisure fisheries are gaining importance, the sector remains weakly regulated and lacks systematic data, limiting its effective management and integration into broader fisheries and coastal planning processes (Figure 10).

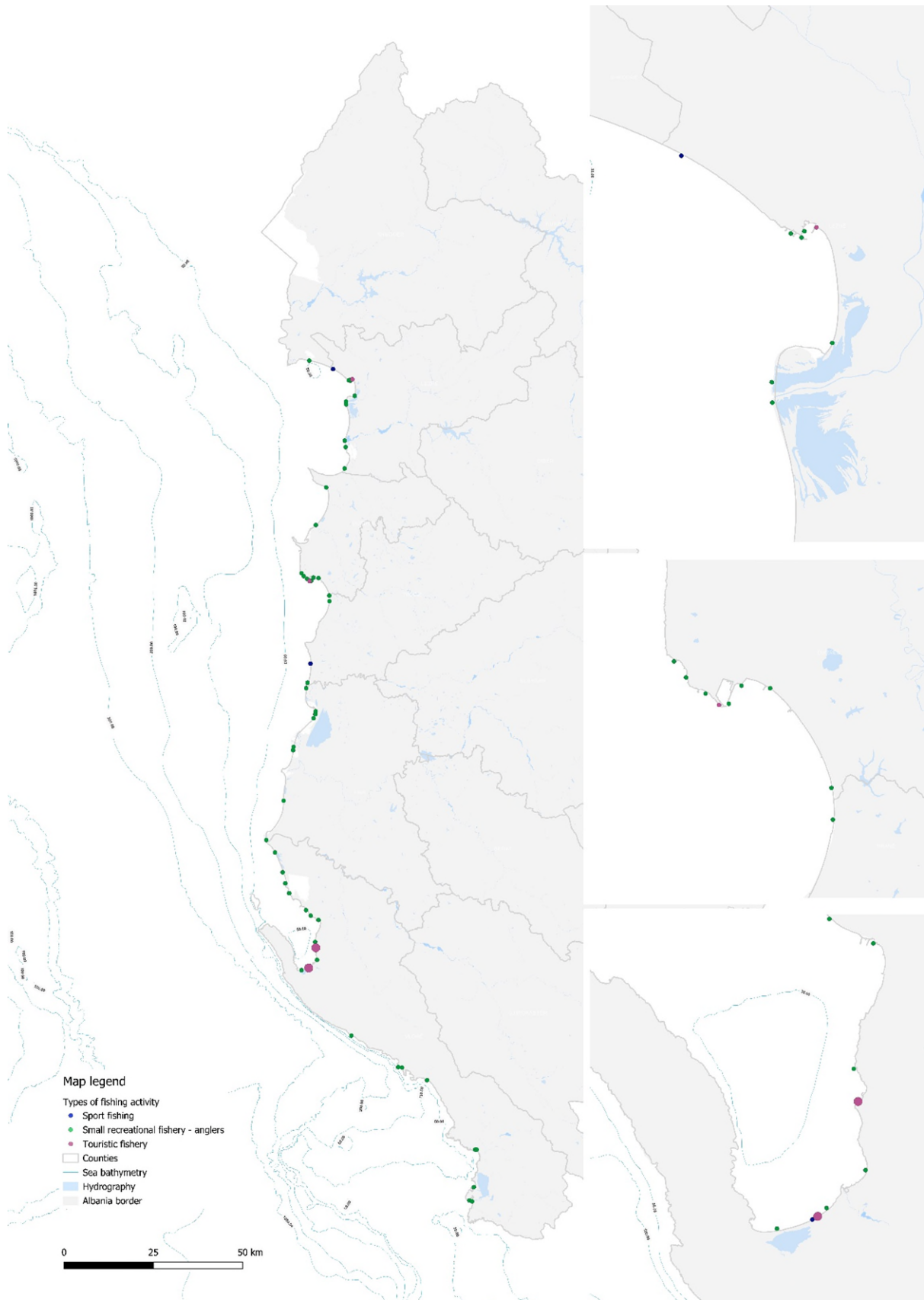


Figure 10. Approximate distribution of recreational and leisure fisheries along the Albanian coastline



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4.4 Interactions of small-scale and recreational fisheries with other sectors and uses

SSF in Albania interacts with several coastal and marine sectors and uses, including industrial fisheries, aquaculture, tourism and nature protection. Overall, interactions are characterised by relatively limited direct conflicts at present, but with emerging pressures—particularly spatial—linked to coastal development and increasing economic use of marine areas.

Interaction with industrial fisheries

Interactions between SSF and the industrial fleet are currently limited. Spatial conflicts, which were more evident in the past, have largely been resolved through improved monitoring and enforcement systems. Vessels over 12 m are now equipped with vessel monitoring systems (VMS) and are prohibited from operating within the 3 nautical mile coastal zone, which is primarily largely used by SSF, or in waters shallower than the 50 m isobath, whichever occurs first.

As illustrated in Figure 11, the combination of these restrictions significantly reduces spatial overlap between industrial and small-scale fisheries. This is particularly evident along the Adriatic coast, where the 50 m isobath lies further offshore and the no-trawling zone largely extends beyond the 3 nautical mile limit, providing a wider area for SSF activities. In contrast, along the Ionian coast, where deeper waters occur much closer to the shore, the 50 m isobath lies largely within the 3 nautical mile zone, resulting in a narrower no-trawling area. Consequently, industrial fishing activities can take place closer to the coast than in the Adriatic. Nevertheless, SSF activity in these areas is somewhat less intensive, further limiting potential interactions between the two sectors.

Their ecological interactions are also limited, as the two sectors operate in different depth zones and use different fishing gears, resulting in only partial overlap in target species. From an economic perspective, both sectors access the market without significant price competition, despite differences in operational costs (e.g. fuel subsidies for larger vessels).

The main remaining issue is not direct competition but structural: SSF lack adequate and dedicated landing infrastructure. Existing ports provide only partial or informal access, highlighting the need for improved facilities and sectoral organisation.



Figure 11. Approximate zone with no trawling, largely corresponding with the SSF activity zone in Albania (3NM)



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Interaction with aquaculture

A recent development in the aquaculture sector in Albania is the identification and designation of AZAs through DCM No. 461 of 26 July 2023. These zones provide a spatial framework for the development of marine aquaculture, guiding site selection and aiming to reduce potential conflicts with other marine uses. While AZAs have now been formally designated along the Albanian coast, not all of them are currently in use or operational.

As illustrated in Figure 12, the designated AZAs are generally located within the coastal zone, partly overlapping with the 3 nautical mile area where SSF activities typically take place. However, stakeholder consultations and spatial analysis indicate that there are currently no significant interactions or conflicts between aquaculture and SSF. Fishing activity within AZAs is limited. Where it does occur, it is typically occasional, carried out by aquaculture operators themselves and more recreational in nature, rather than part of regular SSF operations.

This reflects the planning approach underpinning the designation of AZAs, which seeks to prioritise aquaculture within designated zones while minimising spatial conflicts with other marine uses. AZAs do not constitute strict no-fishing zones but they include clear prohibitions. In practice, fishing is limited by operational and site-specific conditions, including safety and navigation restrictions around aquaculture installations such as exclusion zones around cages and mooring systems.

From an ecological perspective, potential concerns are mainly associated with enclosed areas such as Vlorë Bay, where aquaculture activities may contribute to increased nutrient loads and localised pollution. However, these issues are not currently identified as conflicts by SSF stakeholders and point rather to the need for strengthened environmental monitoring. It should also be noted that this area is located near the Karaburun–Sazan MPA, where SSF activity is already limited.

From a production and market perspective, aquaculture does not appear to negatively affect SSF. Farmed species such as seabass and seabream are supplied through established market channels and do not directly compete with products from SSF, further reducing potential economic conflicts between the two sectors.

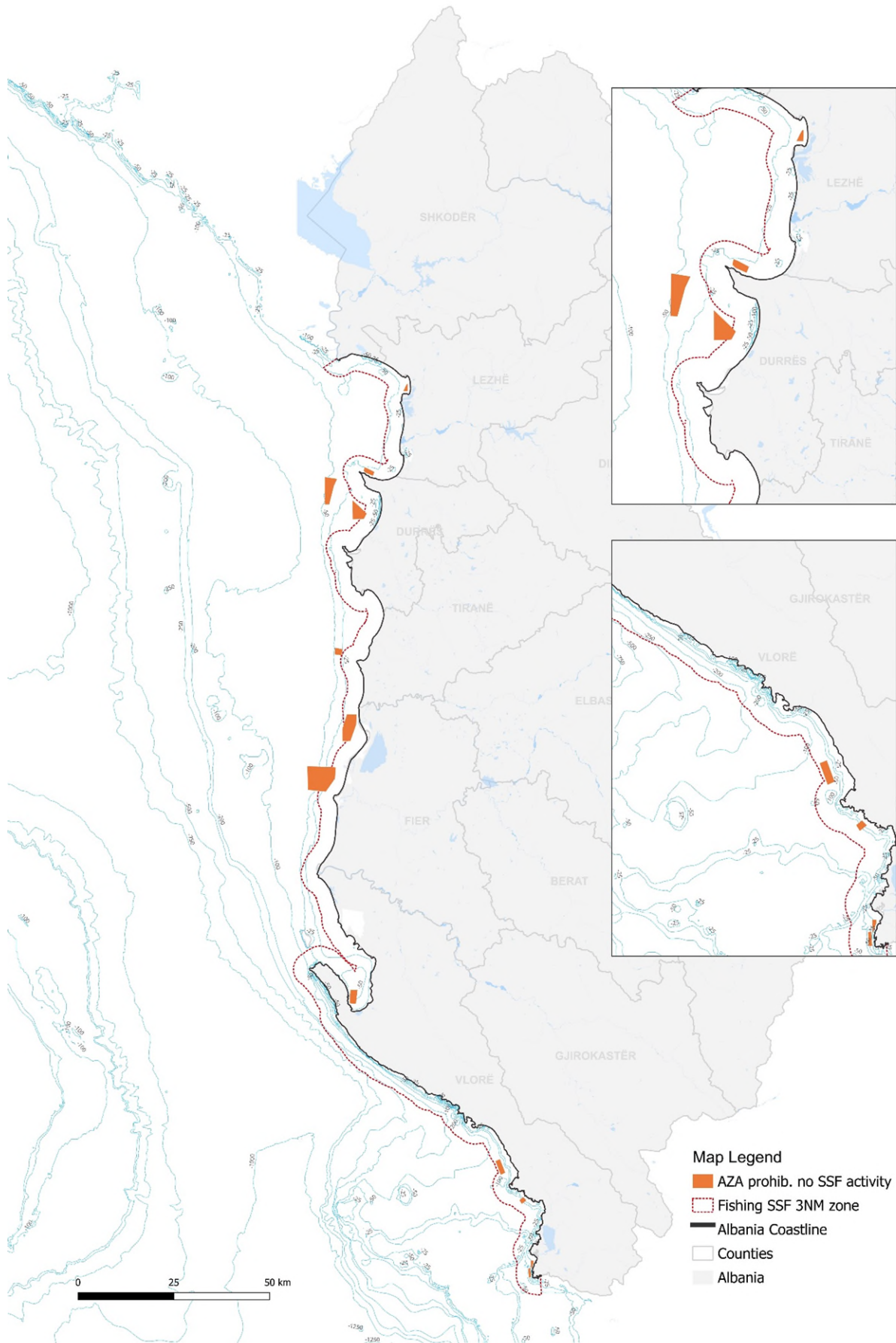


Figure 12. AZAs in Albania and their spatial relation to the SSF activity zone (3NM)



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Interaction with nature protection

As of 2025, Albania has designated approximately 21.7% of its territory as Protected Areas, primarily under IUCN Categories II–V. In contrast, Marine Protected Areas (MPAs) cover a significantly smaller share of the territorial sea (approximately 2%). Along the coast, seven protected areas are present, of which two are designated MPAs (Figure 13): the Karaburun–Sazan National Marine Park and the Porto Palermo Natural Park. Butrint National Park, which holds a triple international designation as a UNESCO World Heritage Site, a National Park and a Ramsar wetland site, is primarily established for the protection of the coastal lagoon and the Vivari Channel connecting it to the Ionian Sea, and includes only a limited adjacent marine area.

The management of activities within protected areas is defined through management plans, which typically distinguish between core zones, traditional use zones, and recreational zones. These zoning regimes establish varying levels of protection and regulate human activities, including fishing.

Overall, interactions between SSF and protected areas in Albania are primarily shaped by these zoning systems, which generally impose strict limitations on commercial fishing activities. In both Karaburun–Sazan and Porto Palermo MPAs, as well as in Butrint National Park, commercial fishing, including SSF, is not permitted across all zones, while only limited forms of recreational fishing are allowed in specific areas and subject to special permits.

As a result, direct interactions between SSF and MPAs are generally limited. In Porto Palermo, the potential for conflict is low, due to restricted access for fishing activities defined by the management plan, as well as the area's physical characteristics, which constrain the presence of SSF.

In Karaburun–Sazan, interactions are more spatially differentiated. In the more exposed outer parts of the peninsula, fishing activity is limited and interactions are minimal. In contrast, in the more sheltered inner areas, some fishing activity occurs in adjacent zones and may occasionally extend into the MPA, mainly as a result of non-compliant practices, leading to moderate levels of interaction. Historically, pressures on marine ecosystems were linked to illegal practices, such as the use of explosives and the harvesting of date shells and coral, often associated with small vessels. However, inspection and enforcement capacity have improved in recent years. Coordination between the MPA management authority (RAPA Vlorë), fisheries inspectorates and maritime control structures has been strengthened, contributing to better compliance and a reduction in previously widespread illegal activities. Cooperation with SSF is generally reflected in improved compliance and occasional reporting of irregularities, particularly in nearshore areas. There is further potential to strengthen this relationship by involving SSF more actively in monitoring and stewardship roles.

In Butrint National Park, the marine component is limited in extent and located very close to the shore, which constrains its relevance for SSF activities. As a result, interactions between SSF and the protected area are minimal and the potential for conflict is low.

Beyond formally designated protected areas, fisheries legislation in Albania establishes a



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range of spatial restrictions aimed at protecting sensitive coastal and transitional habitats. In accordance with Law No. 64/2012 on Fisheries and its implementing acts, fishing is prohibited within a radius of 2 km from the mouth of the Buna River and 1 km from the mouths of all other rivers. Additional restrictions apply at lagoon–sea interfaces, where fishing is prohibited within communication channels and in adjacent coastal areas within a radius of 2 km from their discharge into the sea, including specific limitations on the use of gillnets and trammel nets within 1 km of these areas (Figure 15).

Further spatial restrictions are defined through Order No. 149 (31.03.2022) and related provisions. These include restrictions on the use of trawl and pelagic nets in Vlorë Bay, as well as specific limitations along the outer Karaburun coast. These measures apply to all fishing activities, including SSF, and contribute to the protection of sensitive coastal ecosystems outside formally designated protected areas.

Overall, interactions between SSF and protected areas in Albania can be characterised as low to moderate, largely due to restrictive management regimes, limited spatial overlap in some areas, and improved enforcement. At the same time, there is clear potential for positive interaction, with SSF contributing to monitoring, reporting and supporting the management of protected areas, thereby enhancing conservation outcomes.

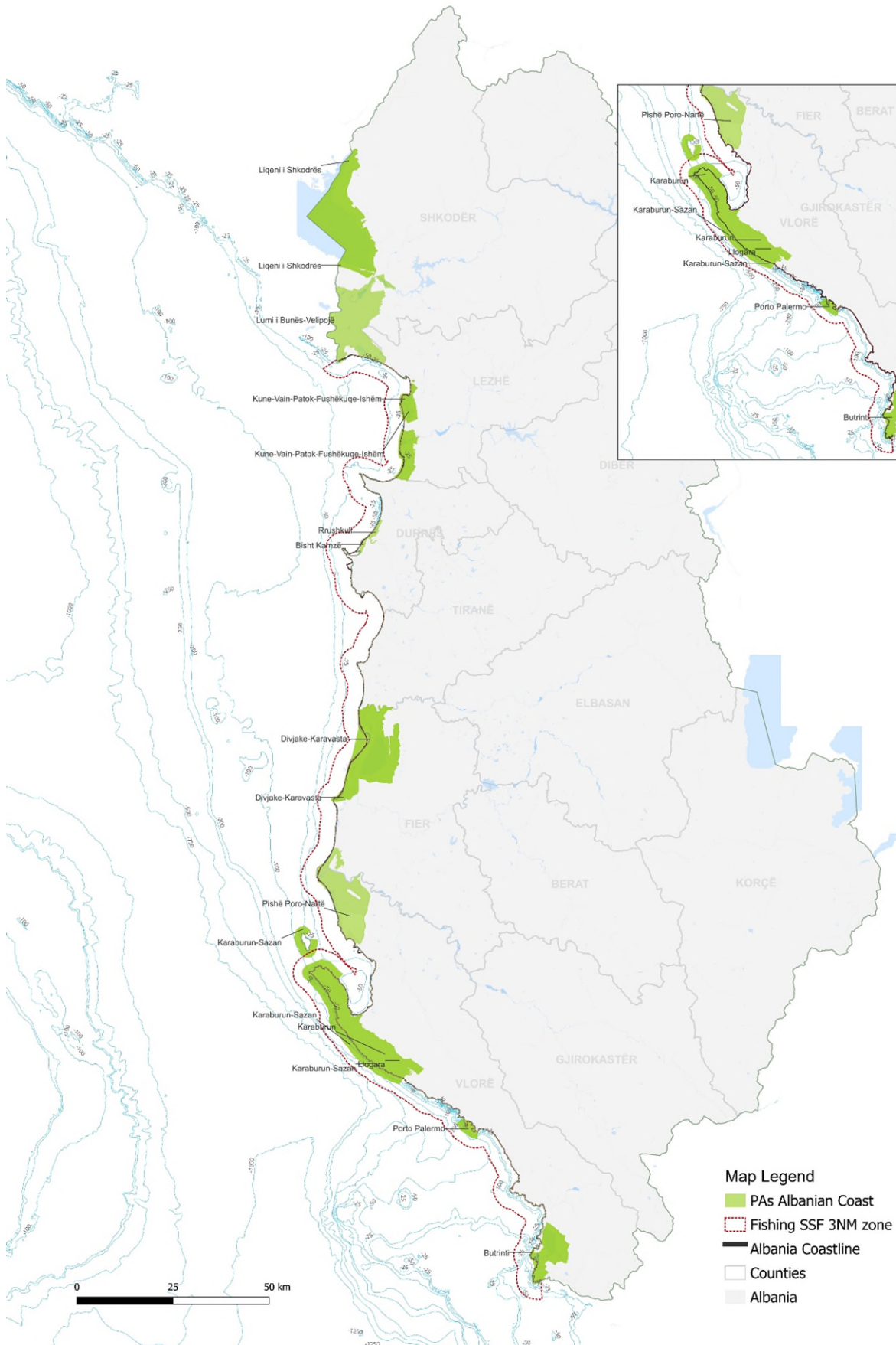


Figure 13. Coastal and Marine Protected Areas along the Albanian coast, and their spatial relation with the SSF activity zone (3 NM)



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Interaction with tourism

Tourism is the fastest-growing coastal sector and represents dynamic interaction with predominantly recreational and leisure fishery (RLF), occurring along the coastline, particularly in beach areas, as illustrated in Figure 14.

Coastal beaches are central to tourism development but are also subject to specific regulatory protections that limit certain fishing activities. According to fisheries regulations, recreational fishing is prohibited during the tourist season between 08:30 and 19:30 within 200 m of beaches and 100 m of rocky shores. Underwater fishing is further restricted within 500 m of beaches frequented by visitors and within 100 m of rocky shores (Figure 14). These measures aim to ensure safety and support tourism activities, thus shaping the spatial use of coastal areas by fisheries.

As a result, tourism generates both synergies and emerging spatial constraints for recreational fishery. On the one hand, tourism increases demand for fresh seafood, allowing fishing products to achieve higher market prices and supporting local value chains. Many fishers are also partially engaged in tourism-related activities, providing additional income opportunities. On the other hand, regulatory restrictions in beach areas, combined with increasing pressure from recreational boating, diving and marina use, can limit access to traditional fishing grounds, particularly in high-use areas such as Orikum and parts of the Vlorë region.

Looking ahead, the expansion of coastal tourism infrastructure—especially the development of “exclusive” or heavily managed beach areas—may further constrain artisanal fishing practices, particularly by reducing access to landing sites and nearshore areas. This highlights a growing need to balance tourism development with the spatial and operational needs of fisheries.



Figure 14. Beach areas along the Albanian Adriatic and Ionian coast, showing beach buffer areas, with fishing restrictions of 100, 200 and 500 meters for RLF, all within SSF activity zone (3NM)



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Cross-sectoral interactions with small-scale and recreational fisheries

Building on the general low-conflict relationship outlined above, the analysed AZA sites indicate that interactions between SSF and aquaculture remain primarily low to moderate intensity, without evidence of significant competition for space. This is partly supported by the operational set-up of aquaculture sites, where safety and navigation requirements around installations limit access and reduce overlap with fishing activities. In Shëngjin, mussel longline cultivation (*M. galloprovincialis*) takes place within a designated AZA, with spatial interaction with SSF remaining low to moderate. This reflects planned siting and clear spatial allocation, as well as awareness of aquaculture installations, resulting in limited interference with artisanal fishing activities. In Vlorë Bay, finfish cage culture (*S. auratus*, *D. labrax*) operates in proximity to SSF within a semi-enclosed system. Interactions are primarily spatial, with low direct conflict but potential ecological interaction related to water quality and cumulative pressures, highlighting the need for continued environmental monitoring (Table 13). Interactions between SSF and industrial fisheries are currently limited and low-intensity. This reflects a clear spatial separation of activities, with SSF concentrated in the coastal zone (up to 3NM) and larger vessels operating further offshore. As a result, interactions between the two segments are minimal and do not represent a significant source of pressure or conflict within the coastal system.

Building on the general patterns described above, the site-based analysis suggests that interactions between RLF and tourism are primarily linked to the concentration and seasonality of activities within the same coastal space.

While most locations show low-intensity interactions, specific sites such as Orikum illustrate how higher tourism pressure—combined with multiple uses, including marinas, boating, and diving—can lead to more pronounced spatial and ecological interactions. In these areas, the simultaneous presence of activities during peak season can reduce the operational flexibility of recreational fisheries (Table 13).

From an ecological perspective, interactions are generally assessed as medium, reflecting the cumulative effects of intensive use of shallow coastal areas. These pressures remain gradual but are more evident in locations with sustained or concentrated tourism activity.

Building on the general patterns outlined above, the site-based analysis shows that interactions between SSF and nature protection are strongly influenced by a set of spatial restrictions defined in Albanian fisheries and environmental legislation (Table 13).

In addition to zoning within MPAs, several regulatory measures directly affect fishing activities in ecologically sensitive areas. These include buffer zones around river mouths (2 km for the Buna River and 1 km for other rivers) and around lagoon–sea interfaces (2 km), as illustrated in Figure 15. These measures limit fishing activities in areas that function as key nursery and feeding habitats and are therefore subject to stricter management.

As a result, interactions are most evident in areas where SSF operates in proximity to protected or regulated zones, particularly Karaburun Sazan and lagoon and river-influenced systems such as Kune–Vain–Tale, Divjakë–Karavasta, and Butrint, where SSF operates

within or adjacent to these regulated zones. In these areas, the interaction is not driven by competition for space, but by the need to operate within clearly defined ecological buffers and seasonal or functional restrictions.

Additional constraints apply in specific contexts such as Vlorë Bay, where trawling is prohibited, within the bay, reinforcing the controlled nature of fishing in this semi-enclosed and environmentally sensitive area. While such measures primarily target more intensive fishing, they contribute to the overall regulatory context within which SSF operates.

Table 13. Selected spatial interactions of SSF/RLF with other sectors

| # | Location | Type of Interactions | Main Actors Involved | Intensity |
|---|---------------------------------|---|---|-----------|
| 1 | Shëngjin (Lezhë region) | SSF vs. Mollusc Aquaculture: spatial interaction within designated AZA for offshore mussel (<i>M. galloprovincialis</i>) longline cultivation; limited interaction due to planned siting and awareness of installations, with minimal interference with artisanal fishing grounds | Artisanal fishers; mollusc aquaculture operator ; Ministry of Agriculture and Rural Development | Medium |
| 2 | Kune-Vain-Tale (Lezhë region) | SSF vs. Nature Protection: interaction in delta-lagoon system shaped by fishing restrictions near river mouths (1-2 km buffers) and lagoon-sea interfaces | Artisanal fishers; Ministry of Environment | Medium |
| 3 | Divjakë-Karavasta (Fier region) | SSF vs. Lagoon/National Park: spatial and ecological interaction in lagoon-coastal interface influenced by regulatory buffers (river mouths, lagoon channels) and habitat sensitivity | Artisanal fishers; park management authority; lagoon users; Ministry of Environment | Medium |
| 4 | Orikum (Vlorë region) | RLF vs. Tourism: spatial and ecological interaction in a high-use coastal area combining beach activities, marina operations, diving and nautical tourism; seasonal concentration of uses increases pressure on nearshore fishing areas | Artisanal fishers; tourism operators (marina, diving, boating); local authorities | Medium |
| 5 | Vlorë Bay (Vlorë region) | SSF vs. Finfish Aquaculture: spatial proximity between cage culture (<i>S. auratus</i> , <i>D. labrax</i>) and SSF within semi-enclosed bay; low direct conflict but potential ecological interaction (water quality, cumulative pressure), requiring monitoring | Aquaculture operators ; artisanal fishers; environmental authorities | Medium |
| 6 | Karaburun-Sazan (Vlorë region) | SSF/RLF vs. MPA: interaction driven by zoning regime; SSF restricted in all zones; limited recreational fishery allowed under special conditions in traditional use areas; illegal fisheries occur | Artisanal fishers; MPA management authority; Ministry of Environment | Medium |
| 7 | Butrint (Vlorë region) | SSF vs. Lagoon/National Park: interaction within the lagoon system under regulated use; fishing is subject to ecological constraints and management | Artisanal fishers; park management authority; lagoon users; Ministry of | Medium |



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| | | | | |
|--|--|--|-------------|--|
| | | rules in protected areas and a sensitive environment | Environment | |
|--|--|--|-------------|--|

Overall, interactions between SSF and other sectors along the Albanian coast reflect a largely structured and differentiated use of coastal space. While some sectors, such as aquaculture and industrial fisheries, show limited interaction with SSF due to clear spatial separation and planning, others—particularly tourism—introduce more variable and locally concentrated pressures that may increase over time. At the same time, interactions with nature protection are primarily shaped by regulatory constraints in sensitive areas (Figure 15), but also highlight opportunities for more active involvement of SSF in monitoring and management. Together, these patterns point to a system where interactions are generally controlled, yet require continued attention in areas of increasing coastal use intensity.

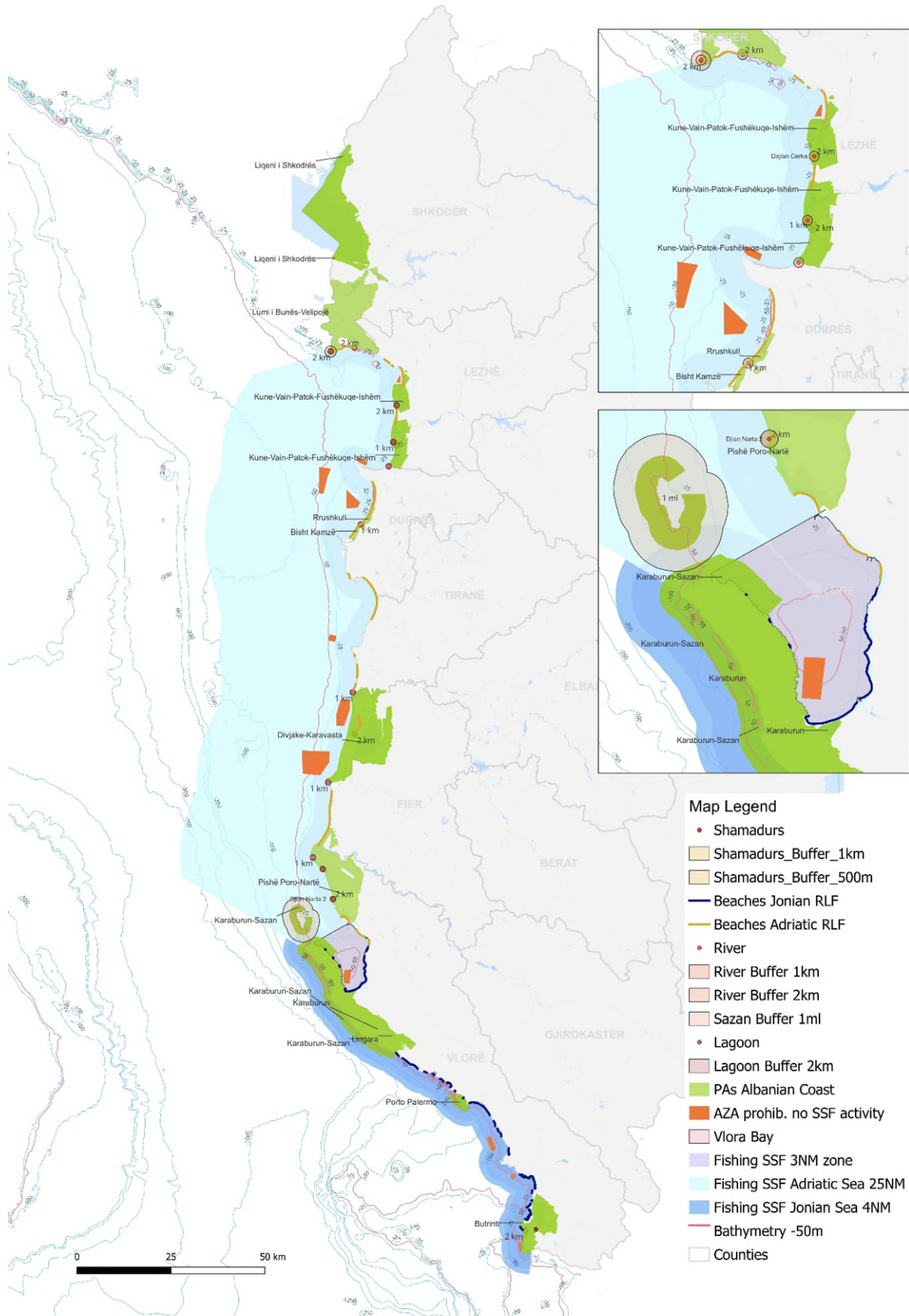


Figure 15. Cross sectoral selected interactions in Albania, addressing fishing restrictions within ecologically sensitive areas (river deltas, lagoons, Vloë Bay), MPAs, AZAs and safety zones within the regulated radius at lagoon/river mouth entrances (shamadur)



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4.5 Key findings and identified challenges

The analysis confirms that SSF in Albania represent a spatially widespread and socio-economically relevant sector, strongly embedded in the coastal zone and connected with other marine and coastal uses. At the same time, the sector remains only partially formalised and insufficiently reflected in structured planning processes.

A key first finding is the spatial distribution of SSF, which is extensive along the entire coastline and concentrated in the nearshore (up to 3 NM). This places SSF at the centre of interactions with most other sectors, particularly tourism, nature protection and aquaculture. Despite this overlap, the analysis shows that **direct conflicts are generally limited**, with most interactions assessed as low- to medium-intensity and largely shaped by existing regulatory frameworks and sectoral practices.

A second important finding concerns the **effectiveness of sectoral regulation**, particularly in reducing historical conflicts. Improved monitoring, control, and Surveillance systems have significantly reduced interactions with industrial fisheries, while the designation of AZA has helped avoid spatial conflicts with aquaculture. Similarly, nature protection measures, including MPAs and specific fishing restrictions in sensitive areas, have contributed to a more structured coexistence between SSF and conservation objectives.

At the same time, the analysis highlights that **interactions are becoming more dynamic**, particularly in tourism. While still largely manageable, tourism introduces increasing spatial and ecological pressures in high-use coastal areas, especially during peak seasons. These pressures are not always expressed as direct conflict, but rather as gradual constraints on access, increased competition for space and cumulative impacts on coastal ecosystems.

A key cross-cutting finding is that SSF and RLF **operate predominantly in ecologically sensitive coastal and transitional areas**, where lagoons, river deltas and shallow nearshore habitats are present and subject to specific regulatory restrictions. As a result, SSF activities are strongly influenced by management measures applied in these areas, making them particularly sensitive to regulatory changes and access limitations.

At the same time, these findings point to several structural challenges affecting the sector's long-term sustainability and integration.

A major challenge is the **lack of comprehensive data on SSF**, which limits understanding of its impacts on fish stocks and the marine environment. While this report has made an important step in structuring available data, significant gaps remain, particularly regarding unlicensed vessels and actual catch volumes, which are estimated to be higher than official statistics.

A related challenge is the **limited level of organisation and representation of the SSF sector**. The absence of fully functional associations or co-management structures reduces the ability of SSF to effectively engage in decision-making processes, including MSP and protected area management.

Infrastructure constraints also represent a key issue. The **lack of adequate landing sites and dedicated facilities** for SSF along much of the coast limits operational efficiency, safety



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and market access, and is closely linked to the absence of organised **monitoring** systems that are essential for effective fisheries management and control.

In addition, while enforcement has improved, **illegal fishing practices have not been fully eliminated**. Activities such as the use of explosives, although significantly reduced compared to previous decades, are still occasionally reported and continue to pose risks to marine ecosystems and the sustainability of fish stocks.

Finally, a central challenge identified through this analysis is the **limited integration of SSF into broader planning frameworks**, including MSP. While sectoral regulations exist and function relatively well, there is no comprehensive mechanism to integrate SSF spatially and strategically with other uses. This limits the ability to address cumulative pressures, anticipate future conflicts and fully recognise the role of SSF within the blue economy.

Overall, the findings point to a system where interactions are currently manageable and largely regulated, but where increasing coastal pressures, combined with structural gaps in data, organisation and planning integration, call for more coordinated and forward-looking approaches.

4.6 Conclusions and Recommendations

The following conclusions are based on the results of the national analysis and on the policy and technical documents reviewed during its preparation. They take into account the evolving policy context under the EU Green Deal and the increasing role of MSP in ensuring sustainable and balanced use of marine and coastal resources.

The preparation of Action Plans for the management of SSF remains a key priority in several Mediterranean countries, including Albania. As highlighted in relevant EU policy processes (e.g. Chapter 13 – Fisheries), there is a need to further develop and implement approaches aligned with the FAO Regional Plan of Action for Small-Scale Fisheries (RPOA-SSF), while adapting them to national contexts and the specific characteristics of SSF fleets.

In this context, two complementary sets of recommendations emerge: (i) recommendations to be addressed through national SSF Action Plans, and (ii) recommendations relevant for the integration of SSF considerations into marine spatial planning processes.

Recommendations for the Action Plan for the management of SSF

1. **Strengthening the organisation of the SSF sector**
Improving the organisation of the coastal SSF sector is an important step towards establishing effective management arrangements. This practice is already applied in inland fisheries and could provide a useful model for coastal fisheries governance. Implementing such approaches would require further formalisation of the sector and the establishment of representative organisational structures, potentially similar to fisheries management organisations or Fisheries Local Action Groups (FLAGs) used in EU countries.
2. **Improving data collection and formalisation of the SSF sector**



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Strengthening the knowledge base on SSF activities is necessary to support evidence-based fisheries management. Updating fishing fleet registers and improving the collection of data related to SSF activities would provide a more reliable basis for decision-making. These measures should not be perceived as an administrative burden for fishers, but rather as a mechanism that enables their recognition within policy frameworks and facilitates access to support schemes. Improved data availability would also support broader marine governance and planning processes.

3. Improving landing infrastructure and operational conditions for SSF

Improving landing sites dedicated to small-scale fisheries would contribute to better operational conditions, safer mooring capacity, improved handling of fish products and compliance with food safety standards. Investments in landing infrastructure could also support improved marketing of local fish products and strengthen the economic viability of the SSF sector. This should also contribute to better data collection and monitoring, which are essential for sustainable management.

4. Supporting the transition of the SSF sector in line with EU Green Deal objectives and climate adaptation policies

The SSF sector will need to progressively adapt to emerging environmental and climate-related policies associated with the EU Green Deal. This includes improving awareness among fishers of new environmental requirements, as well as the potential costs and benefits associated with more sustainable and low-carbon practices. The fisheries sector should therefore be considered in national climate policy frameworks, including long-term strategies and adaptation plans. Supporting the involvement of SSF in climate adaptation measures will contribute to strengthening the resilience of coastal communities and marine ecosystems.

Recommendations for Marine Spatial Planning

In parallel with the development of SSF Action Plans, MSP processes can play an important role in ensuring that the spatial needs of the SSF sector are adequately recognised and integrated within broader marine and coastal management frameworks.

1. Ensuring effective participation of SSF representatives in MSP processes

The participation of SSF fishers and their representative organisations in MSP processes is essential to ensure that spatial planning decisions adequately reflect the needs and realities of coastal fisheries. A more organised SSF sector would facilitate structured dialogue with planning authorities and strengthen the representation of fishers' interests.

2. Identifying and recognising traditional fishing grounds

MSP processes should consider the spatial distribution of traditional SSF fishing areas in order to recognise their importance and reduce potential conflicts with



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other marine uses. Mapping results, such as those developed within this national activity, can provide an initial basis for identifying and documenting these areas. Formally acknowledging traditional fishing grounds would help ensure that future developments are assessed in relation to their potential impacts on SSF activities.

3. Securing space for landing sites and access to fishing areas

MSP and ICZM processes should ensure that adequate space is reserved for SSF landing sites, harbour access and related infrastructure. This is particularly important in areas experiencing rapid coastal development, where tourism, urbanisation or other maritime activities may compete for the same space.

4. Supporting the integration of SSF within marine protected areas and biodiversity management measures

Where appropriate, SSF activities can coexist with biodiversity protection objectives. SSF fishers possess valuable traditional ecological knowledge regarding fishing grounds, seasonal dynamics and areas essential for species reproduction and regeneration. This knowledge can play an important role in identifying ecologically significant areas and informing spatial measures that support both biodiversity conservation and the long-term sustainability of fisheries. MSP and marine protected area management processes should therefore actively involve SSF fishers in zoning, planning and management discussions. A positive example of such collaboration exists in the Karaburun–Sazan protected area; however, this approach should be further strengthened and formalised, particularly in view of the planned expansion of the marine protected area network.

5. Improving spatial knowledge on SSF activities to support MSP

Improved spatial data on SSF activities, including fishing grounds, landing locations and seasonal patterns, would support better integration of fisheries considerations into MSP processes and help reduce spatial conflicts with other marine uses.

Overall, the findings provide a practical and evidence-based foundation for advancing the sustainable management of small-scale fisheries in Albania, in line with the objectives of the EU Green Deal and the transition towards a sustainable blue economy. The approaches and recommendations presented can support both the development of national SSF Action Plans and their integration into MSP processes. Ensuring coherence between these processes will be essential to enable a coordinated, ecosystem-based and climate-responsive approach, while strengthening the role of small-scale fisheries within integrated coastal and marine management.



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4.7 Contribution to European Green Deal objectives

The analysis carried out under the Albania pilot provides a concrete example of how SSF can be more systematically integrated into marine and coastal planning processes, directly contributing to key objectives of the EGD. In particular, the work demonstrates how spatially explicit SSF data and knowledge can support both sustainable fisheries management and biodiversity protection (Table 14).

Table 14. Contribution of the Albania WP3 pilot action to European Green Deal objectives

| EGD Pillar | Albania Pilot Contribution |
|---------------------------------|--|
| C. Sustainable fisheries | Preparation of SSF spatial data that can feed into future national MSP layers, improving evidence-based fisheries management |
| D. Biodiversity | Linking SSF traditional knowledge and management zones with MPA designation and participatory management |

Under the sustainable fisheries pillar, the preparation and structuring of SSF spatial data within the MEDIGREEN project represents a significant step towards more evidence-based management. By identifying fishing areas, activity patterns and interactions with other sectors, this information creates a foundation for integrating SSF into future MSP processes. This is particularly relevant in a Mediterranean context, where SSF is often underrepresented in planning frameworks despite its socio-economic and cultural importance.

Under the biodiversity pillar, the pilot highlights the value of linking SSF knowledge with conservation objectives. The identification of artisanal fishing areas, together with their spatial relationship to MPAs and other ecologically sensitive zones, provides a concrete basis for a more integrated and ecosystem-based approach to spatial management. It also opens space for participatory approaches, where fishers can contribute to the monitoring and management of protected areas, strengthening both compliance and effectiveness of conservation measures.

Importantly, the Albania case addresses a key gap observed across the Mediterranean: SSF is rarely systematically incorporated into MSP processes in a spatially explicit manner. In this context, the pilot provides an initial but concrete basis for the future development of MSP in Albania, particularly by demonstrating how SSF data can be collected, structured and linked to broader planning and environmental objectives. While still at an early stage, this approach offers a useful reference that could be further developed and gradually upscaled, both within Albania and, where relevant, in other Mediterranean contexts.



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5. CROSS-COUNTRY COMPARISON: ALGERIA AND ALBANIA

5.1 Overview of the two pilot contexts

Despite sharing the Mediterranean Sea as a common geographic and ecological frame, Algeria and Albania present different profiles in terms of MSP maturity, institutional architecture, sectoral focus, and the nature of the governance challenges they face. Understanding these differences and the lessons that flow across them is central to the transferable value of the MEDIGREEN WP3 pilots.

Algeria is a large southern Mediterranean coastal state (2,148 km coastline) at an early stage of MSP development. No dedicated MSP legislation exists, and marine governance remains fragmented across sectoral laws administered by multiple ministries without formal coordination. The WP3 pilot focused on marine aquaculture and the designation of AZAs, a sector undergoing rapid growth (47% production increase 2020–2024) but whose spatial development is constrained by governance gaps, data deficiencies, and unresolved conflicts with artisanal fisheries, desalination, and tourism.

Albania is a smaller Adriatic and Ionian coastal state (476 km coastline) where the foundations for MSP have been established in recent years, notably through the transposition of the EU MSP Directive and the preparation of key technical and institutional elements for launching the process, with the support of UNEP/MAP – PAP/RAC. The WP3 pilot focused on SSF, a sector that is widespread along the entire coastline, socially and economically important, but still characterised by informality, limited organisation and significant data gaps. While official records indicate around 581 licensed vessels, the actual number is higher due to a considerable share of unregistered or informal operators. SSF activities are concentrated in the nearshore zone and interact with other coastal uses, yet remain insufficiently reflected in existing data systems and planning processes. As such, the main challenge in Albania is not the absence of a regulatory or policy framework, but the need to translate this emerging MSP framework into operational practice, particularly by improving the visibility, understanding and integration of SSF within future spatial planning and decision-making processes.

5.2 Comparative analysis

The following table 15 presents a structured comparison across seven key dimensions, drawing on the full findings of sections 3 and 4:



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Table 15. Cross-country comparison of MEDIGREEN WP3 pilot actions: Algeria and Albania across key MSP governance dimensions

| Dimension | Algeria | Albania |
|-------------------------------|---|---|
| MSP maturity | Initial, no dedicated MSP legislation; sectoral management only | Emerging, with key legal and technical foundations in place; MSP Directive transposed and preparatory phase advanced, but plan not yet adopted |
| Sector focus | Marine aquaculture development and AZA designation | Integration of SSF into future MSP, with emphasis on improving spatial data and visibility of the sector |
| Main spatial challenge | Zoning conflicts between aquaculture, artisanal fishing, desalination and tourism; data scarcity | Limited data on SSF, combined with low but increasing spatial and potential ecological pressures in nearshore areas, driven by tourism development and regulatory constraints in ecologically sensitive zones (e.g. MPAs, lagoons and river mouth buffers). |
| EGD leverage | Food security, blue economy, sustainable seafood, biodiversity protection | Sustainable seafood, biodiversity protection |
| Institutional anchor | National Centre for Fisheries and Aquaculture Research and Development (CNRDPA) + Direction Générale de la Pêche et de l'Aquaculture (DGPA)/ Ministry of Agriculture, Rural Development and Fisheries (MADRP) | Ministry of Agriculture and Rural Development, in coordination with the Ministry of Infrastructure and Energy and the Ministry of Environment, supported by national (territorial planning and protected areas) and regional (protected areas) agencies, as well as fishing communities |
| Key outputs T3.1 | Candidate AZA map; conflict matrix (6 zones); suitability scoring matrix; stakeholder map | SSF/RLF spatial data layers, as well as layers relevant for other sectors (aquaculture, industrial fishery, tourism, protected and ecologically sensitive areas); participatory identification of fishing areas; recommendations for integration into future MSP |
| Transferable lessons | AZA methodology and conflict matrix approach applicable across North Africa | Initial approach for integrating SSF into MSP through spatial data and local knowledge, with potential for gradual upscaling in Mediterranean contexts |

Beyond identifying which EGD objectives drove the design of each pilot, it is important to note how each analysis concretely contributes to EGD implementation at the local level. In Algeria, the MEDIGREEN analysis and AZA designation methodology directly advance EGD pillar C (sustainable seafood production) by providing a science-based framework for locating aquaculture in compatible zones, reducing conflict with artisanal fisheries, and avoiding sensitive habitats, thereby promoting the sustainable growth of a food production sector with significant national food security implications. It also contributes to pillar D (biodiversity protection) by systematically integrating MPA buffers and Posidonia exclusion zones into site selection criteria, and to pillar F (zero pollution) through the inclusion of water



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quality monitoring thresholds in the AZA scoring grid. In Albania, the SSF characterisation and spatial mapping work directly advances EGD pillar C and D by linking fishing community knowledge and activity zones to MPA management. It also contributes to the governance dimension of the EGD by establishing the spatial evidence base necessary for SSF communities to participate formally in national MSP processes, a prerequisite for socially inclusive and ecologically informed maritime governance.

5.3 Shared findings and cross-cutting lessons

Notwithstanding their differences, the two pilots converge on a set of shared findings that carry broader significance for Mediterranean MSP governance.

Visibility of underrepresented users as a prerequisite for planning

In both countries, the central challenge is not the absence of marine uses but their invisibility in planning systems. In Algeria, artisanal fishing grounds are not georeferenced and their spatial extent is unknown to planning authorities, making conflict assessment qualitative rather than quantitative. In Albania, approximately 400 SSF vessels operate without valid licences, and official catch statistics underestimate actual landings by at least 25%. In both cases, MSP cannot effectively protect or balance these sectors until their spatial footprint is formally documented and regularly monitored. Participatory mapping, improved data systems and the progressive formalisation of these sectors are therefore a shared priority to ensure their effective recognition and integration into planning processes.

Different governance challenges, common implications for MSP integration

Both countries face governance-related challenges, though of a different nature. In Algeria, the fragmentation is horizontal: multiple ministries govern the marine space without a coordination mechanism, and decisions are made in sectoral silos. In Albania, the challenge is not institutional fragmentation, but the effective operationalisation of an existing framework. While a relatively comprehensive legislative and institutional structure is in place, SSF remains only partially formalised, with limited data and spatial representation, and is therefore not yet effectively integrated into planning processes. In both cases, addressing these challenges is essential to enable a more coherent and effective integration of sectors into future MSP processes.

Tourism as an emerging and underestimated conflict driver

In both pilot countries, coastal tourism emerged as a relevant and growing source of pressure on traditional marine uses. In Algeria, tourism conflict reaches critical intensity in Chlef and high intensity in Oran, where summer coastal crowding makes aquaculture siting contested. In Albania, seasonal restrictions on fishing near beaches, and recreational boating in areas such as Orikum and the Vlorë region are interacting with RLF activities. The expansion of exclusive coastal tourism infrastructure poses a particular risk in both



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contexts. MSP frameworks in both countries need to better account for tourism, whose spatial footprint and interactions with other maritime sectors require a more comprehensive understanding.

Interactions as differentiated but evolving dynamics

Across the two pilots, interactions between sectors show different levels of intensity. In Algeria, several interactions are already characterised by high or very high conflict between aquaculture and other coastal uses, reflecting strong competition for space and limited coordination. In Albania, interactions are generally low to medium intensity and remain largely manageable, shaped by existing regulatory frameworks and sectoral practices.

At the same time, the analysis shows that in both contexts these interactions are evolving, particularly in areas of increasing coastal use. This highlights the importance of moving from reactive conflict management towards more anticipatory and integrated spatial planning approaches.

MSP as an enabler of EGD implementation, not only a planning tool

A consistent finding across both pilots is that MSP, approached through the EGD framework, generates governance benefits beyond spatial organisation. The process of identifying conflicts, mapping stakeholders, and assessing data gaps, even before a formal plan is adopted, builds institutional relationships, generates evidence, and creates pressure for regulatory reform. In Algeria, the MEDIGREEN spatial analysis is already informing discussions on AZA legislation. In Albania, the SSF characterisation work produced under this deliverable fills a documented gap in official knowledge and creates an evidence base for SSF and RLF representation in the national MSP framework.



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6. CONCLUSIONS

6.1 Summary of main findings

Deliverable D3.1 aims to generate planning-relevant evidence and methodological approaches to support the integration of European Green Deal priorities into future MSP processes in non-EU Mediterranean countries, through two pilot case studies in Algeria and Albania. These pilots demonstrate the feasibility and practical value of applying EGD-aligned MSP approaches in contexts with different levels of governance maturity.

For Algeria, the pilot produced a comprehensive set of analytical outputs: a multi-criteria suitability scoring matrix evaluating ten site selection criteria across three coastal clusters (weighted scores: West 3.32/5, Central 3.25/5, East 3.48/5); a six-zone spatial conflict assessment identifying the most acute conflict hotspots along the 2,148 km coastline; a conflict matrix demonstrating that finfish cage culture and artisanal fisheries represent the highest-intensity conflict dyad, while seaweed and macroalgae cultivation presents the lowest conflict profile; a full stakeholder map covering five institutional tiers; and a DPA field survey across 14 coastal wilayas providing unprecedented primary source evidence on the ground governance realities, including the finding that only 4 out of 14 surveyed wilayas have operational knowledge of the AZA concept. These results not only provide technical evidence but also directly inform the ongoing regulatory process, strengthening the institutional credibility of the MSP approach (informing the draft AZA decree currently under preparation by the Ministry of Agriculture). Taken together, these results demonstrate that MSP-related analytical tools can already play a structuring role in sectoral governance, even in the absence of a formal MSP framework.

For Albania, the pilot produced the most comprehensive characterisation of the SSF sector to date, documenting an actual fleet of approximately 1,015 vessels (significantly above 581 licenced), annual catches estimated at 700–1,000 tonnes with likely 25% underreporting, and dispersed spatial distribution concentrated in the Vlorë, Lezhë, and Durrës regions. The interaction analysis, covering fisheries, aquaculture (AZAs), nature protection (Karaburun-Sazan, Porto Palermo, Butrint; as well as other ecologically important areas), and tourism, provides the spatial evidence base needed to integrate SSF into Albania's national MSP framework in a meaningful and rights-respecting way. A key finding is the strong potential for positive SSF-MPA interaction, where fishing communities can contribute to monitoring and co-management, an underexplored opportunity that should be further pursued. This highlights the importance of improving the spatial visibility of underrepresented sectors, such as SSF, as a critical first step for their effective integration into MSP processes.

Overall, the two pilots confirm that generating spatially explicit, planning-relevant evidence is a necessary precondition for the effective integration of EGD priorities into MSP, particularly in contexts where planning systems are still emerging.

6.2 Methodological and policy lessons for the Mediterranean



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Beyond the country-specific outputs, the two pilots together generate several transferable lessons for Mediterranean MSP governance.

On methodology: The five-step analytical workflow (desk review → data collection → spatial analysis → conflict identification → policy recommendations), combined with the structured stakeholder assessment approach introduced in 2.3, proved well-adapted to both contexts and could serve as a replicable template for other non-EU Mediterranean countries, where MSP development is at a similarly early stage. The DPA's field survey instrument, developed by CNRDPA, is particularly transferable as a rapid assessment tool for governance readiness and spatial conflict mapping at the regional level.

On governance: Across both pilots, a consistent finding is that MSP development does not require comprehensive institutional reform in early-stage contexts, but can effectively progress through targeted, incremental interventions focused on coordination, data systems and sectoral spatial organisation. In both cases, the most impactful near-term interventions are gradual: establishing a coordination mechanism (Algeria), formalising data collection, registration systems and infrastructure support (Albania), creating a legal foundation for spatial designations (AZAs in Algeria), thereby strengthening the legal and institutional basis for spatial planning and monitoring of the sectors. These targeted reforms, if implemented, would unlock the full value of the spatial analysis conducted under this deliverable.

On the EGD as a lever for change: In both countries, the European Green Deal provided a normative framework that can motivate institutional engagement and justify the MSP work even in the absence of formal EU membership. For Algeria, the EGD alignment of MEDIGREEN enabled CNRDPA to frame the AZA methodology within an internationally recognised sustainability agenda, strengthening its credibility with national policy makers. For Albania, the EU accession process amplifies the relevance of MEDIGREEN findings, as the national MSP framework must demonstrate alignment with EU directives and GFCM recommendations. This suggests that the EGD can function as an effective driver of MSP governance reform in non-EU Mediterranean countries when operationalised through concrete spatial planning tools.

Adapting MSP approaches to different governance contexts: The pilots demonstrate that MSP-related processes can be advanced through context-specific entry points, even in the absence of fully operational MSP systems. Sector-focused analyses can help build the foundations for more comprehensive planning over time. In this context, neither country requires a complete institutional redesign; rather, targeted and incremental governance improvements can deliver significant progress. These could include establishing a coordination mechanism, strengthening data collection and supporting targeted, sectoral spatial designations. These steps would unlock the full value of the spatial analysis.

Using pilot actions to support gradual institutional development: Pilot-scale activities can serve as practical testing grounds for MSP-related approaches, helping to build institutional



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familiarity, technical capacity and inter-sectoral dialogue. By producing concrete outputs—such as spatial datasets and interaction analyses—they support incremental progress towards more structured planning frameworks.

Addressing underrepresented sectors as an entry point for MSP: One of the lessons is that even sectors that are not yet fully reflected in planning systems, such as SSF, can serve as practical entry points for MSP development. Starting from these sectors helps ground planning processes in actual spatial uses and socio-economic realities, while progressively building the basis for more comprehensive and integrated planning approaches.

Ensuring transferability through simple and adaptable approaches: The methodology applied demonstrates that relatively simple and flexible approaches—combining desk analysis, stakeholder engagement and spatial tools—can generate meaningful results and be adapted to different Mediterranean contexts, including those with limited data or institutional capacity.

From analysis to implementation: A key lesson emerging from both pilots is that ensuring analytical work produces planning-relevant outputs is a necessary but not sufficient condition for effective MSP. While spatial datasets, mapped activity areas and interaction analyses provide essential foundations, their translation into operational planning instruments, regulatory frameworks and decision-making processes remains the main challenge. Bridging this gap requires not only robust technical outputs, but also adequate institutional, legal and governance capacity. Addressing this transition should be a priority for future MSP-related initiatives in the Mediterranean.

Taken together, the results of Deliverable D3.1 outline a practical and scalable pathway for Mediterranean countries at early stages of MSP development: starting from key sectors, building spatial data foundations, strengthening institutional capacities and progressing through gradual, achievable steps. The approaches and lessons generated are directly relevant for broader Mediterranean cooperation processes and can inform future sea-basin level initiatives aimed at strengthening MSP implementation beyond EU borders.



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