Fish-X

Policy Recommendations – WP 7.5

Enabling a fair digital transition for small-scale fisheries

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Abstract	The deliverable 7.5 “Policy recommendations” summarises three years of project’s activities in tangible actions dedicated to policymakers at European, national and regional levels. The policy recommendations laid down in this document are also framed for the wider fisheries-related community including the fisheries sector, fisheries scientists and the civil society. The document is structured around an understanding of the new sociopolitical context since June 2024, followed by the achievements of the Fish-X project. Lessons learned from these achievements are used to suggest policy changes in ongoing and future initiatives led by the Directorate-General on Fisheries and Maritime Affairs (DG Mare) of the European Commission. The Fish-X project aims to contribute to the discussion on the future of the fisheries sector and to provide solutions that could help the small-scale sector remaining sustainable in the long-term while safeguarding the health of marine ecosystems.

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Acronyms and abbreviations

Abbreviation	Meaning
VMS	Vessel monitoring system
SSF	Small-scale fisheries
GFCM	General Fisheries Commission for the Mediterranean
EU	European Union
DG Mare	Directorate-General for Maritime and Fisheries Affairs
FAP	Fisheries and Aquaculture Products
GDPR	General Data Protection Regulation
STECF	Scientific, Technical and Economic Committee for Fisheries
ICES	International Council for the Exploration of the Sea
ERS	Electronic Reporting System
FLUX	Fisheries Language for Universal Exchange
AI	Artificial Intelligence
ACs	Advisory Councils
MSP	Maritime Spatial Planning

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EMFAF	European Maritime Fisheries and Aquaculture Fund

1. Introduction

The Fish-X project is a data-driven initiative that aims to steer innovation and push forward the digitalisation of small-scale fisheries. To achieve the objectives set by the European Green Deal and the Farm to Fork Strategy, a series of calls for research projects were launched. The Fish-X consortium won a call for a project to advance fisheries technology for the small-scale fleet segment supporting sustainable fisheries management. The project ran from June 2022 until May 2025.

1.1 European Commission President Ursula von der Leyen's second mandate

Over these three years, many external and internal factors have affected European small-scale fisheries and the digital innovation sector. On the external aspect, price inflation, including those of gas and energy, and geopolitical tensions impacted the economic viability of these two sectors and their long-term competitiveness. On the internal scene, the political context in the European Union evolved with the outcome of the European elections in June 2024. The European Parliament's political majority moved from centre to centre-right. A greater number of centre-right national governments was also reflected in the designation of the new College of Commissioners. European Commission President Ursula von der Leyen retained her role for a second mandate (2024-2029) and argued that the new Commission's priorities would be defence, economic competitiveness, and the implementation of the European Green Deal.

The political priority shift is captured in Commission President Ursula von der Leyen's political guidelines, which revolve around the Draghi Report on the future of European competitiveness, the report of the Strategic Dialogue on the future of EU agriculture, and the Letta report on the future of the Single Market.[1] The Mission Letter handed over to EU Oceans and Fisheries new

[1] Draghi report on EU competitiveness, accessible here: https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en.

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Commissioner, Costas Kadis, is based on these roadmaps. Since the inception of the new College of Commissioners in November 2024, a couple of initiatives were released to execute the political guidelines such as the Competitiveness Compass, and the Clean Industrial Deal, conceived to boost EU competitiveness and decarbonisation.[2]

1.2 Achievements of the Fish-X project

The Fish-X project was designed to boost fisheries innovation, with a focus on the small-scale fleet segment, to enhance the sector's efficiency and long-term sustainability. The consortium is composed of nine partners: the coordinator (TransMarTech), three technical partners (CLS, OURZ, North.io), two civil society organisations (Sciaena, WWF), two fisheries representatives (LIFE, IIMRO), and a communicator (EUTECH).

After three years of activity, the main achievements are the following:

- **Deployment of 104 geolocation devices and 11 electronic gear markers** on small-scale fishing vessels.
- Development of **three technological platforms** adapted for small-scale fisheries, which can be adapted for recreational fisheries:
    - **Fish-X Data Space**: A secure platform centralising fisheries data exchange, fostering collaboration, sovereignty and transparency across the sector over their data.
    - **Insight Platform**: An online cartography tool, fed by small-scale fisheries Vessel Monitoring Systems (VMS) data, displays the vessel presence and

Strategic Dialogue on the future of EU agriculture report, accessible here: https://agriculture.ec.europa.eu/overview-vision-agriculture-food/main-initiatives-strategic-dialogue-future-eu-agriculture_en#strategic-dialogue-report
Enrico Letta report on the future of the single market, accessible here: https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf.

[2] European Commission, The Clean Industrial Deal: A joint roadmap for competitiveness and decarbonisation, 2025. Accessible here: https://commission.europa.eu/document/download/9db1c5c8-9e82-467b-ab6a-905feeb4b6b0_en?filename=Communication%20-%20Clean%20Industrial%20Deal_en.pdf
European Commission, A competitiveness compass for the EU, 2025. Accessible here: https://commission.europa.eu/document/download/10017eb1-4722-4333-add2-e0ed18105a34_en

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fishing effort aggregations while ensuring the anonymisation of data subjects in statistics.

- **Traceability Application**: A repository to input and access traceability information along the seafood supply chain from producers to consumers.

- **Outreach activities** totalising seven in-person events (General Fisheries Commission for the Mediterranean – GFCM - side events, GFCM SSF Forum, European Parliament, Conferences, Mediterranean Advisory Council) and 19 online events (i.e. webinars, working groups, workshop, online exhibit).[3]
- **Strategic documents**:
  - **Three White Papers**
    - Fish-X White Paper 1 – The digital transition of small-scale fisheries in the European Union[4]
    - Fish-X White Paper 2 - Digital traceability driving sustainable seafood consumption in the European Union[5]
    - Fish-X White Paper 3 - Leveraging fishery technology to safeguard marine resources and support small-scale fisheries activities
  - **Roadmap** to drive the digitalisation of the EU fisheries sector
    - Preliminary version released six months after the start of the project.[6]
    - Final roadmap released by April 2025.
  - **Policy Recommendations**
    - These are summarised in this present document based on the entire project, including the execution of high-level events and the production of three white papers. This document summarises key findings, identified challenges, and provides concrete proposals for future

[3] Event Webpage of Fish-X: https://fish-x.eu/events/
[4] https://fish-x.eu/wp-content/uploads/Fish-X-White-Paper-1-%E2%80%93-The-Digital-Transition-of-SSF-in-the-EU-final.pdf
[5] https://fish-x.eu/wp-content/uploads/FINAL_FISH-X-WHITE-PAPER-2_Digital-traceability-1-1.pdf
[6] https://fish-x.eu/wp-content/uploads/2023/04/Fish-X_Preliminary_Roadmap_16122022_final-design.pdf

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policies, based on analyses, discussions, and recommendations from all phases of the project.

1.2.1 Policy relevance of the Fish-X project

The activities of the Fish-X project were mostly geared towards supporting the implementation of the EU Fisheries Control Regulation 2023/2842, which revises the existing monitoring, control and surveillance system of EU fisheries. The Fish-X project focused mainly on the following articles:

- Article 9 – Vessel Monitoring Systems: on the gradual use by small-scale fisheries by 2030.
- Article 14 – Completion of the fishing logbook: electronic reporting for small-scale vessels by 2028.
- Article 58 – Traceability: information required for seafood products and study on available digital solutions.

In addition, the consortium worked in relation with the following pieces of EU legislation with regards to data management, environment, energy and fisheries files:

- General Data Protection Regulation (EU) 2016/679;
- Artificial Intelligence Act (EU) 2024/1689;
- Maritime Spatial Planning Directive 2014/89/EU;
- Marine Strategy Framework Directive 2008/56/EC;
- EU Strategy on offshore renewable energy;
- Common Fisheries Policy (EU) 1380/2013.

Based on the political guidelines of Commission President von der Leyen and of the Mission Letter of Commissioner Costas Kadis, the Fish-X project's policy recommendations can also be relevant for the forthcoming strategies:

- Evaluation of the Common Fisheries Policy;

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- Vision for the fisheries sector with a 2040 perspective.

The Fish-X consortium would like to put forward the recommendations detailed in the section below. These are the lessons learned from the project based on the development of the technological tools, the exchange with a large panel of stakeholders during the outreach activities and the conduction of three use cases with fishers and fishers' associations in Ireland, Croatia and Portugal. The proposals are designed to fit with ongoing initiatives led by the Directorate-General for Fisheries and Maritime Affairs of the EU Commission (DG Mare). The policy recommendations also target, when specified, different types of stakeholders (i.e. fisheries industry, digital companies, scientific institute, civil society) and several sub-European decision-making levels (i.e. national, regional and local authorities).

2. Policy recommendations from the Fish-X consortium

2.1 Implementation of the EU Fisheries Control Regulation (EU) 2023/2842

2.1.1 Traceability requirements

As laid out in Article 57, operators **must record and make available traceability information in a digital way** to the next operator in the supply chain during all stages of production, processing and distribution, from "catching to harvesting to retail stage" for the following seafood products:[7]

- For fresh and frozen fishery and aquaculture products (FAPs) (including imported products) by 10 January 2026;
- For prepared and preserved FAPs (including imported products), following feasibility study conducted by the EU Commission, by 10 January 2029;
- For Algae by 10 January 2029.

[7] https://marketac.eu/wp-content/uploads/2024/04/DG-MARE-Presentation-New-Traceability-Rules.pdf

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The delegated acts on the traceability requirements for lots of Chapter 16, subheading 1604 and 1605 fisheries and aquaculture products, including the use of digital systems since the results of a feasibility study will be released by June or July 2025.[8]

According to paragraph 9 of Article 58 on traceability, the Commission shall conduct a **study on feasible traceability systems and procedures,** including minimum traceability information, for fishery and aquaculture products falling under headings 1604 and 1605 of Chapter 16 of the Combined Nomenclature, with a view to defining detailed rules for such products. The study shall include **an analysis of available digital solutions** or methods which meet the requirements on traceability in this Regulation, while considering the impact on small operators. The aim is to kick-start the study by June 2025 at the latest.

Policy recommendations for the implementation of Article 57:

- **Traceability requirements** should be coherently applied as laid out in the EU's Marketing Standards for fishery and aquaculture products, the Common Market Organisation and the Fisheries Control Regulation. The requirements should apply to **processed and prepared products**, as is already done for **fresh and frozen products,** as well as to **imported and domestically produced products**. The information displayed to consumers should be **standardised for all retail actors, including the food service sector.** Supplying granular and reliable information, including **more precise data on the catch area**, is crucial for efficiently assessing the **legality and safety of seafood products** and ultimately improving fisheries management and catch traceability.
- **Adaptation to the needs of small-scale fisheries** must be central to ensure the buy-in from this sector. Digital reporting tools should be easy to use and useful for fishers, for which co-designing is essential. Activities **to raise awareness and build digital literacy towards traceability** should be done to ensure proper implementation and compliance with relevant EU legislation. In addition, the benefits to small-scale fisheries from improved transparency and traceability should be made clear with regards to **market access, product valorisation and fair economic return** (amongst other potential uses and benefits). Seafood product labelling could turn traceability information collected along the full supply chain into eye-catching displays **to promote**

[8] https://marketac.eu/wp-content/uploads/2025/01/DG-MARE-Presentation-Traceability.pdf

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products harvested by small-scale fishers and how these generate socio-economic benefits.

- **Improve data collection along the entirety of the value chain** with comprehensive and robust data sets, **including for processed and prepared seafood products**. Subject to informed consent, privacy and General Data Protection Regulation (GDPR) requirements, **collected data could be made available for scientific purposes**, including the work conducted by scientific bodies such as the Scientific, Technical and Economic Committee for Fisheries (STECF) and the International Council for the Exploration of the Sea (ICES). Qualitative data collection would be beneficial for **improving monitoring programs and overall transparency of the seafood industry**.
- **Ensure effective data infrastructure across the EU** with strong mobile data coverage to support robust data collection, management and storage, complying with traceability requirements and standards. Data infrastructure should fit within SSF distribution along coastlines and the multiplicity of landing sites.

2.1.2 Fishing Activity and Vessel Position Reporting for SSF

A major change in the Fisheries Control Regulation 2023/2842 is the introduction of the VMS and Electronic Reporting System (ERS) obligation for SSF vessels. These solutions should be easier to implement than the equivalent solutions for larger vessels, taking into consideration the short duration of SSF's fishing activities, and the lack of space onboard.

1. **Vessel Monitoring System applicable to SSF**

EU Member States shall make available a vessel monitoring system for European fishing vessels of less than 12 meters. Following the request of some Member States, the Commission was asked to develop a vessel monitoring system for fishing vessels of less than 12 meters in length overall.

2. **Electronic transmission of fishing logbook for SSF**

In the article 15a, Member States may use a system for electronic fishing logbooks for catching vessels of less than 12 meters developed at national or European Union level.

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Following the request of some Member States, the European Commission was asked to develop such a system for catch reporting of small-scale vessels.

As per the same article, SSF are exempt from reporting per fishing operation, from prior notification of port arrival and departure, and from sending their fishing logbook after the last fishing operation and before landing.
Given the diversity and typically short duration of SSF activities, which often involve polyvalent vessels and a range of fishing gears, high resolution sampling of trajectories are required to be properly analysed. The implementing act should encompass different values specified as SSF have shorter fishing trips/fishing times than the large-scale fleet (fishing license, duration of a fishing operation, minimum duration of a fishing trip, number of successive fishing trips per day, number of fishing events within one trip). Given that there is no consensus yet among the fishery's scientific community on the optimal temporal resolution value for SSF, best available knowledge dictates that the resolution should be lower than five minutes, and shorter than the duration of the fishing operation.[9]

The increase in sampling rates does not proportionally increase the costs since data sets can be stored and forwarded when returning into the cellular network coverage (a difference with vessels larger than 12 meters, for which real-time transmission is required).

3. Software solution developed by DG Mare

DG Mare is currently developing the software solution for these new reporting requirements on vessel position and fishing activity for catching vessels of less than 12 meters in length overall. The mobile application is designed to collect a number of data on the identification of the user and of the vessel, fishing activity (catches and discards, fishing time, lost fishing gear), return to port (port, date and time) and landing declaration, fishing gears (owned, onboard, dimensions: mesh size, number and size of hooks), vessel position data (coordinates, date, time, speed and course) and the history of previous logbooks submission.

[9] Egekvist, J., Rufino, M.M., 2022. ICES. Workshop on Geo-Spatial Data for Small-Scale Fisheries (WKSSFGEO) Report; Technical Report. (vol. 4, Issue 10). https://doi.org/1 0.17895/ices.pub.10032

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The development of the application will start in Q2 2025 and continue until Q4 2026, with the aim of being ready for use by Q1 2028.[10]

As laid out in the paragraph 8 of article 9, the implementing act is currently under discussion to define the format and content of vessel position data, the time lapse for position transmission, the minimum requirements and minimum technical specifications of vessel monitoring devices, the transmission of data to coastal Member States, and the responsibilities of the masters of fishing vessels concerning the operation of vessel monitoring devices.

Policy recommendations for the successful digitalisation of small-scale fisheries:

Interoperability:

- Careful attention should be given to ensure datasets are interoperable and shareable between systems and across governance levels – whether local, regional or international – with special emphasis on the protection of fishers' privacy. Accessibility to and replication of these systems for wider use is also essential.

Standardisation:

- Data collection and submission processes must follow a given standard (i.e. be based on the Gaia-X framework) to facilitate exchanges among Fisheries Monitoring Centres, as well as more widely with other stakeholders, to ensure quality and reliable data (i.e. collected by VMS, logbooks).
- For fishery control data exchange, Fisheries Language for Universal Exchange (FLUX) enables exchanges between Member States, the European Commission and potential third parties (e.g. Regional Fisheries Management Organisations). However, FLUX remains a very complex concept with heavy rules, therefore the Fish-X consortium recommends that the European Commission proposes simplified rules for SSF.

Improved quality of data collection:

[10] Presentation of Fish-X Event at the EU Parliament on 23 April 2025, accessible here: https://fish-x.eu/wp-content/uploads/Master-Deck_Fish-X-EP-Event-23-April-1.pdf

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- All collected data should **be managed securely** with a platform allowing data sharing among contributors and data consumers, with the intention of progressively granting access to additional stakeholders, considering that the fisheries control regulation allows the EU Commission and the Member States to give access to more parties in the respect of GDPR as per the articles 112 and 113. The Data Space is an example of infrastructure designed to reuse and anonymise the collected data, and to foster data exchange between the FMC **and other data recipients such as scientific partners.**
- Allow fishers to easily **add their GPS position when filling up the fishing logbook**. For example, Fishlog, the application developed by CLS, automatically adds this information by connecting the application to the Vessel Monitoring System position. This is an electronic solution to be able to get the exact location without asking for more work for the fishers. SSF should be involved in the development of the code sign of the EU mobile application.
- **VMS time lapse for SSF** VMS minimum temporal resolution should match the fishing activity time scales to properly monitor SSF and estimate fishing effort. Moreover, when estimating fishing effort, shorter position reporting intervals may improve the machine learning models, and their capacity to discriminate between fishing and non-fishing periods.
- **Artificial intelligence (AI) and machine learning** can improve the data quality by detecting fishing operations using VMS and ensure simple checks on data accuracy. AI algorithms could help fishers improve their way of working or fishing operations, while reducing working hours directly contributing to the reduction of CO2 footprint. Shorter intervals in transmitting positions for small-scale and long-distance fisheries would be beneficial to improve accuracy and train AI models.
- **Fishers' data ownership** should be granted to fishers to choose **where and how long** their data is shared (i.e. with Traceability and Insight platform, but not to train AI) with clear guidelines on how the data is being used.

2.2 Vision for the fisheries sector with a 2040 perspective

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The 2040 Vision for the fisheries sector was announced in the Mission Letter of the EU Commissioner for Oceans and Fisheries. The Vision was intended to describe the issues that affect the fishing community and work to support job creation in the sector, ensure long-term competitiveness and guarantee sustainability. A similar exercise was done for the agriculture and food sectors.[11] Earlier this year, DG Mare released the foresight study "Fishers of the future" developing four scenarios projecting the fisheries sector's possible evolution by 2050 based on analyses of current transdisciplinary trends.[12] The foresight report may also contribute to the forthcoming EU Commission's 2040 Vision for the fisheries and aquaculture sectors.

Policy recommendations for the 2040 Vision for the fisheries sector:

Trusted relationships with fishers:

- **Engage fishers in the digital transition:** this is essential to reflect the realities of SSF and to ensure effective compliance with EU regulations. Empowering SSF must be at the heart of efforts to enhance their visibility and representativity in fisheries management and maritime spatial planning such as Advisory Councils (ACs), co-management committees, dedicated working groups at European or sub-national levels in relation with topics of interest to SSF. This includes involving fishers directly in the design of the digital tools they will ultimately use, ensuring these tools respond to their needs and capacities such as for the application developed by DG Mare to report catches and report vessel position. Crucially, the digital transition should also serve as a lever to incentivise generational turnover and attract young people to SSF, by modernising the sector and making it more accessible, resilient, and future-oriented.

    - **Commit to transparency:** uphold stakeholder engagement principles by ensuring transparent, clear, fisher-owned data frameworks, informed consent, and full GDPR compliance. For these commitments to be impactful and trusted, fishers must be provided with adequate capacity-building, technical support, and accessible guidance.

[11] COM (2025) 75 final, A Vision for Agriculture and Food: Shaping together an attractive farming and agri-food sector for future generations. Accessible here: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52025DC0075

[12] European Commission: European Climate, Infrastructure and Environment Executive Agency, Davies, M., Macfadyen, G., Brugere, C., Chiarelli, N. et al., Foresight study on fishers of the future – Final report, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2926/3984926

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This is essential not only to guarantee informed participation, but also to foster a sense of ownership and understanding of how data is used. Supporting fishers in navigating data-sharing requirements improves compliance, reinforces trust in digital systems, and contributes to more equitable and transparent fisheries governance.

Inclusive and sustainable fisheries management:

- **Strengthen SSF's voice in the decision-making process** is essential for better representativity and sense of ownership by the sector in various decision levels including in ACs and Maritime Spatial planning (MSP) processes. Fishers' socioeconomic and ecological knowledge must be integrated with the collected data to inform policies that value low-impact fisheries and protect marine biological resources, habitats and threatened, endangered and sensitive species.
- **Guarantee fishing grounds for SSF** to inform maritime spatial planning processes and fishery management. The Insight platform can become a decision-making tool to understand the fishing effort of a particular area and its importance for the local SSF community at the time of designing offshore wind sites and marine protected areas.
- **Strengthen the capacity of small-scale fishery representative organisations** as a vital link between authorities and fishers. These organisations, often in the form of cooperatives, are the first contact point with regulatory bodies. By serving as intermediaries, they ensure that the interests and concerns of fishers are effectively communicated to authorities, while also disseminating important regulatory updates and guidance to their members. This makes them an essential component in the fisheries management chain, contributing to more efficient, transparent, and inclusive governance.
- **Enable data-driven management**: encourage the use of digital tools for effective resource management and sustainability monitoring, which can be used for fish stock assessment to factor in climate effects or for drafting maritime spatial plans.
- **Ensure the inclusion of women and young people** in decision-making and capacity-building initiatives. Women represent an often invisible yet essential force in the fisheries sector, contributing significantly to processing, management, and community cohesion. Recognising and empowering women not only promotes gender equality but also strengthens the overall resilience and sustainability of

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fisheries. Young people bring fresh perspectives, energy, and innovation to the fisheries sector, making their engagement crucial for the long-term sustainability and modernization of the industry.

Co-management governance

- Foster legal frameworks, governance platforms and committees to enable multi-level decision-making.
- Include co-management committees as eligible entities for the next European Maritime Fisheries and Aquaculture Fund (EMFAF).

Regional cooperation

- **Strengthen EU-GFCM alignment on illegal, unreported and unregulated (IUU) fighting**: Support greater alignment between the EU and GFCM frameworks on IUU fishing by promoting interregional cooperation, data sharing, and joint enforcement strategies. The EU should take a leading role in fostering exchanges of best practices, technical capacity, and compliance mechanisms across Mediterranean and Black Sea countries. This would contribute to a coherent and harmonised policy framework that enhances transparency, accountability, and effectiveness in combatting IUU fishing both within and beyond the region.

Adaptation to the needs of SSF must be central to ensure the buy-in from this sector:

- **Digital reporting tools** should be easy to use and useful for fishers, for which co-designing is essential.
- **Multilingual engagement**: provide translation and interpretation to ensure communication in all EU languages.

Improving fishers' skills

- **Digital literacy training:** offer training on digital tools, ideally delivered by fishery representative organisations.
- Plant seeds of knowledge, **improving fishing school curriculum** to promote the new roles of fishers concerning sustainability and data management.

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Fisheries science

- **Involve scientists in fisheries management decision-making** at all levels to provide mutual understanding between scientists and fishers. It would help define the minimum level of needs, make simulations of some models with regards to environmental and climate change, and for both scientists and fishers to be more vocal when needed.
- **Improve knowledge exchange and transfer** between scientists, fishers and authorities to collect and analyse data, and to promote educational programs raising awareness on marine and fisheries issues.
- **Citizen science has a transformative role** by actively involving fishers and local communities in data collection, monitoring, and research activities. Well-designed citizen science initiatives can bridge gaps between stakeholders, support adaptive management, and ensure that policies and practices are grounded in both scientific evidence and real-world experience

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