



GREEN TO BLUE: IMPROVEMENT OF SUSTAINABILITY COMPETENCIES IN THE FIELD OF FISHERY & AQUACULTURE

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Result 3 MANUAL & POLICY INDICATIONS

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DISCLAIMER

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PROFILE “SENTINEL OF THE SEA”

The Green to Blue project worked to create an innovative profile in the fishing and aquaculture sector, the "Sentinel of the Sea".

In line with the political indications proposed by the European Parliament resolution of 16 November 2021 "Fishers for the future", this profile aims to ensure that fishing and aquaculture are socially, economically and above all environmentally sustainable in the long term and that this approach continues to be carried out in order to maintain the sector's attractiveness for the labour force and for younger generations. To achieve sustainability in its holistic meaning, together with the improvement of labour conditions, health and safety, social inclusion and a fair standard of living, it is of great importance to **improve the training offer for these professionals that play a fundamental role for the social and environmental wellbeing of the coastal communities** devoted to fisheries and aquaculture, aside from their direct economic contribution.

The professional profile was developed on the basis of the analysis of the activity system and professional needs (and the related system of knowledge, skills and competences). To this end, the following were taken into consideration:

1. The analysis developed by the consortium for the realization of Result 1 - GLOBAL REPORT: Identified Good Practices and Competency Skill Framework.
2. The professional profiles defined by European standards and the national repertoires of qualifications and where relevant the regional ones of each of the participating countries (Italy, France, Greece, Croatia and Turkey).

In consideration of the investigation activities performed by the consortium, the “Sentinel of the Sea” profile can be presented as follows:

Sentinel of the Sea

PROFILE- BRIEF DESCRIPTION

The trained profile is that of “Sentinel of the Sea”, which is designed as an integration to the professional profile of fisherman and fish farmer. This additional profile has the competences and skills to adopt environmentally sustainable behaviours and models, knowing how to recognize the main factors that undermine the preservation of the marine environment and the species that reside there. He/she knows how to approach his/her profession with a high awareness in terms of environmental responsibility; knows the specifics of its reference environment and is able to collaborate with sector players in order to promote sustainable practices aimed at preserving marine resources.

PROFESSIONAL AREA

Maritime transportation, commercial fishing and aquaculture

ACTIVITIES OF THE PROFILE

Following the description of the professional profile, the consortium detected the activities that must be performed by the "Sentinel of the Sea".

These activities have to be considered in complementarity to traditional fishing and/or aquaculture activities and are described as follows:

- observation of the marine environment and species,
- observation of the fishing season,
- prevention and fight against pollution,
- the rational and sustainable exploitation of marine resources,
- the sustainable management of a commercial or tourist activity linked to the marine environment.

In relation to the aforementioned activities, the profile - supported by the system of representation of the sector and scientific research ecosystem present in the area - will be able to:



KNOWLEDGES, ABILITIES AND SKILLS OF THE PROFILE

The "Sentinel of the Sea" profile defines, for each activity, the necessary knowledge, skills and competences (KSC). The summary map of the overall profile is represented in the following table.

KEYWORDS	KNOWLEDGE	COMPETENCES	SKILLS/ABILITIES
#marine_Ecology #biodiversity #ecosystems	Principles of marine biology and ecology: acquire the necessary knowledge about the environment in which they work, to understand the importance of marine organisms and ecosystems.	Understanding the necessary background for the proper treatment of the sea and the organisms for the better functioning of the sea ecosystem and its advantages for the profession.	Apply professional fishing techniques in compliance with the principles of environmental sustainability, taking into account the different types of ecosystems and species
#Fisheries_management #sustainability	EU dimension and contextual framework of the fishing and aquaculture sector in the environmental field: gain the necessary knowledge about the problems facing fisheries today, and how we came to this situation. What could help the sustainability of the fishing profession.	Understand which practices he/she should follow to lead to the sustainability of his/her activity/enterprise. Raised awareness and reflection on what could be improved by the change in environmental attitude toward daily activities.	Adopt a sustainability-oriented mindset in daily operations and promote a change aimed at sustainability for the enterprise and for the sector.
#Plastic_pollution #recycling #protection_of_the_environment #prevention	Environmental protection, management and safeguard: fishers understand the existence of the problem and its impact on their field of work.	Adopt methods and behaviours for the prevention of plastic pollution in the sea, as well as waste collection and differentiation methods and their possible recycling processes	Ability to implement the right pollution prevention and recycling practices and recognize their positive effects on the marine environment.
#Climate change #prevention #action	Environmental protection, management and safeguard: fishers understand the existence of the problem and its	Adopt methods and behaviours for the mitigation of climate change in their profession and in their daily lives.	Capacity to take action either individually or collectively to address the problem, to change every day professional and personal life.

	impact on their field of work.		
#communication #negotiation #cooperation	Principles and techniques of effective communication and collaboration: fishers understand the value of communication and cooperation with their colleagues or other bodies for the proper functioning of their industry and the Protection of the Environment.	To be able to communicate with colleagues and people from different social groups. To be able to work together to achieve their goals. To be able to accept the point of view of other people of the same or different social group.	Capacity to establish strong communication relationships with each other and with their profession-related bodies and to create long-term collaborative relationships with each other and with related bodies.

TRAINING PROGRAMME

The Green to Blue training programme was defined starting from the professional profile and the related system of activities, knowledge, skills and competences. The following table shows the summary representation of the training program developed as part of the activities envisaged by result 2.

Nr	Module	Methodology	General contents addressed
1	KNOWLEDGE OF MARINE ECOLOGY	<p><i>Phase 1:</i></p> <ul style="list-style-type: none"> - Presentations with contents enriched by multimedia resources. - Frequent Q&A sessions. - Discussions and exchange among peers. <p><i>Phase 2:</i></p> <ul style="list-style-type: none"> - Guiding questions on specific issues at local level linked with the general theme. - Discussion and solution design. 	<ul style="list-style-type: none"> ▪ Features of marine ecosystems ▪ Characteristics of organizations ▪ Value of biodiversity ▪ The concept of shelters in marine ecosystems
2	FISHERIES MANAGEMENT	<p><i>Phase 1:</i></p> <ul style="list-style-type: none"> - Presentations with contents enriched by multimedia resources. - Frequent Q&A sessions. - Discussions and exchange among peers. <p><i>Phase 2:</i></p> <ul style="list-style-type: none"> - Guiding questions on specific issues at local level linked with the general theme. - Discussion and solution design. 	<ul style="list-style-type: none"> ▪ Prevailing situation ▪ Problems faced by fishers ▪ Suggestions for Improvement
3	AWARENESS RAISING ON CLIMATE CHANGE	<p><i>Phase 1:</i></p> <ul style="list-style-type: none"> - Presentations with contents enriched by multimedia resources. - Frequent Q&A sessions. - Discussions and exchange among peers. <p><i>Phase 2:</i></p> <ul style="list-style-type: none"> - Guiding questions on specific issues at local level linked with the general theme. - Discussion and solution design. 	<ul style="list-style-type: none"> ▪ The phenomenon of climate change ▪ How climate change affects fisheries ▪ What the future is predicted to be ▪ Changes that can help with this issue

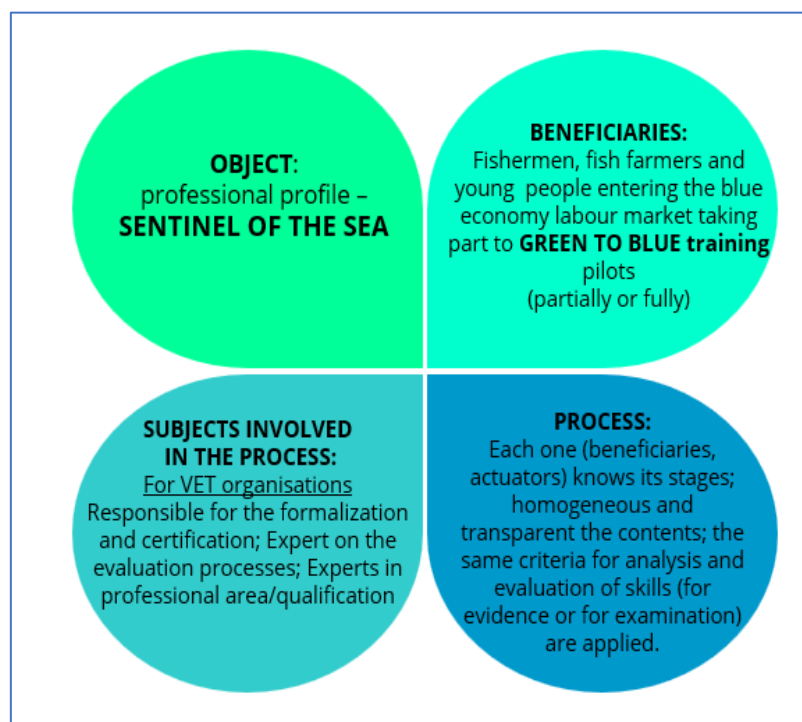
4	<p>AWARENESS RAISING ON PLASTIC POLLUTION</p>	<p><i>Phase 1:</i></p> <ul style="list-style-type: none"> - Presentations with contents enriched by multimedia resources. - Frequent Q&A sessions. - Discussions and exchange among peers. <p><i>Phase 2:</i></p> <ul style="list-style-type: none"> - Guiding questions on specific issues at local level linked with the general theme. - Discussion and solution design. 	<ul style="list-style-type: none"> ▪ The problem of plastic pollution ▪ How it affects the marine environment and marine organisms ▪ How it affects fisheries ▪ Changes that could help with this problem.
5	<p>COMMUNICATION AND COOPERATION FOR FISHING COMMUNITIES</p>	<p><i>Phase 1:</i></p> <ul style="list-style-type: none"> - Presentations with contents enriched by multimedia resources. - Games to animate discussion. - Frequent Q&A sessions. - Discussions and exchange among peers. <p><i>Phase 2:</i></p> <ul style="list-style-type: none"> - Guiding questions on specific issues at local level linked with the general theme. - Discussion and solution design. 	<ul style="list-style-type: none"> ▪ Importance of communication within a social group and beyond ▪ Importance of working with people from the same or a different social group ▪ Exchange of views and concerns

To learn more about the contents and methodologies proposed by the Green to Blue program, we recommend you to consult the program structure and the course package created as part of result 2 (annex 2).

REQUIREMENT FOR THE RECOGNITION OF THE PROFILE

The qualification requirements scheme is divided into three main parts:

- minimum qualification or entry level requirements, divided into levels of education for each participating country (table below);
- attendance (and successful completion) of the training course and recognition of competences / skills linked to each learning outcome;
- the system of recognition of acquired skills, applied by a certified and/or professional training body.



a) Entry level

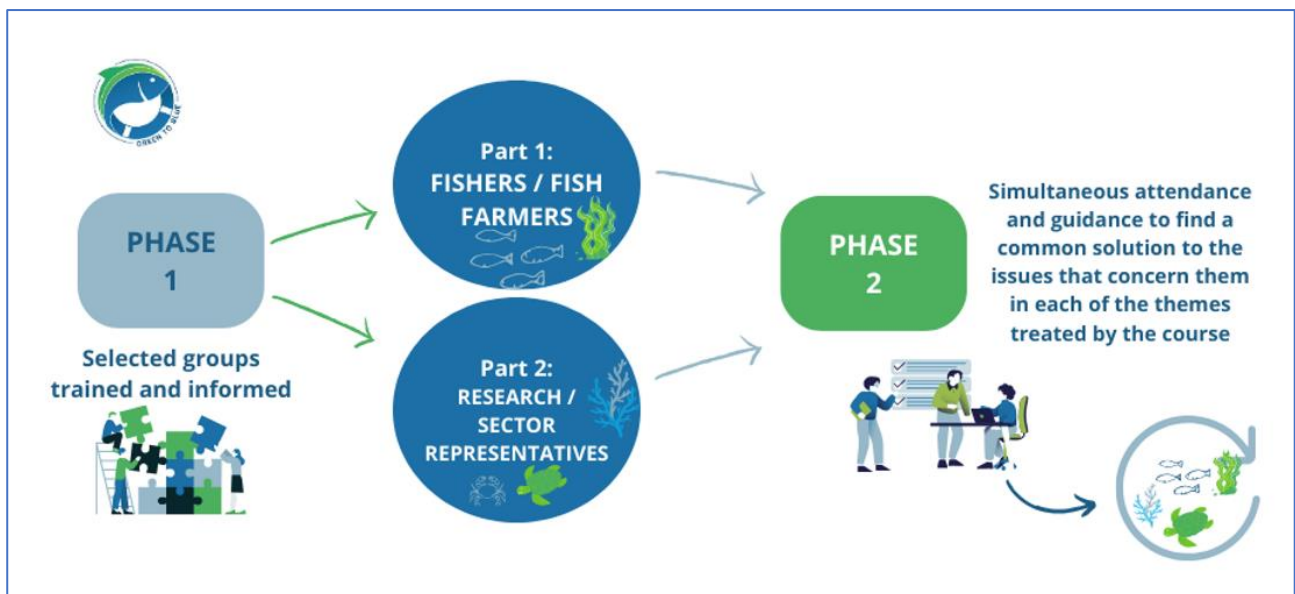
The following table reports the minimum entry level per each country participating in the Green to Blue project in relation to the target group fishers and fish farmers.

ITALY	FRANCE	GREECE	CROATIA	TÜRKIYE
EQF/NQF	EQF/NQF	EQF/NQF	EQF/NQF	EQF/NQF
3 / 3	3/3	3/3	NA/2	NA/NA
Professional area as recognised within NQF (national or regional)	Professional area as recognised within NQF (national or regional)	Professional area as recognised within NQF (national or regional)	Professional area as recognised within NQF (national or regional)	Professional area as recognised within NQF (national or regional)
Emilia-Romagna Regional QF for EQF 3 - Fisheries and aquaculture operator. National QF - aligned with the regional QF	Regional QF aligned with the national QF. EQF 3: Fisheries and aquaculture operator	No specific qualification/professional profile described.	Level HKO 2: Standard occupations – Fisher. Code and name of occupation/related occupation from NKZ10: 6.62.622.6222 Inshore Fishers/ Inshore Fish and Related Occupations 6.62.622.6223 Fishers/ fisherwomen in the open sea.	N/A in TURKIYE
Sources of information	Sources of information	Sources of information	Sources of information	Sources of information
https://orienter.regione.emilia-romagna.it/qualifica/dettaglio/432	https://formations.mer.gouv.fr/recherche?filter_profile=5&filter_need=93 https://www.francecompetences.fr https://formations.mer.gouv.fr/qualifications-pour-fonctions-principales-88 https://formations.mer.gouv.fr/delivrance-et-revalidation-73#summary-target-2	https://proson.eoppep.gr/en/QualificationTypes/Details/49	https://hko.srce.hr/registar/standard-zanimanja/detalji/449	N/A in TURKIYE

b) Training course attendance and recognition of the competences for the “Sentinel of the sea” profile – TRAINING PILOTS OUTCOMES

In order to verify the consistency of the proposed training path, the consortium carried out piloting activities in the last phase of project implementation to test the training model both from a content and methodological point of view.

All partners adopted the two-phase methodology as described in "R2 - STRUCTURE TRAINING PROGRAM AND METHODOLOGIES", which involves the creation of:



For the realization of the training pilots a dedicated didactical material has been developed (see annex 3), in order to organize flexible and short-term experimental activities which however allow all the contents foreseen by the training program to be touched, so as to collect evaluations from the target groups and at the same time also allow an evaluation by the trainers involved in the experimentation in order to perfect the GREEN to BLUE proposal.

In the sheets below we report an overview of the various pilots carried out at a local level, from which the indications and tips arise, as well as the policy indications described in the following sections.

GREEN TO BLUE – Training pilot CORSICA - FRANCE

Location	Corte - Corsica Regional Nature Park
Timing	1 day – 2 hours
Nr of participants	21
Participants // Target group	<ul style="list-style-type: none"> - Agents of the Corsican Regional Nature Park and - Sea professionals residing within the MAB biosphere reserve territory. <p>Following the surveys conducted during the Focus Group, the project's focus shifted to this territory, which encompasses both marine professionals and park management authorities, including fisheries engineers, environmental engineers, and marine area managers. These two types of stakeholders often collaborate in implementing nature conservation measures. Therefore, tools facilitating cooperation are perfectly suited to this context.</p>
Nr and profile of trainer/s	1 Maritime project manager and 1 Development officer
Classroom structure	Common room, prior sending of training materials
General feedback of trainer/s in conducting the pilot	<p>The structure of the courses is good, and the content is logically organized. This was confirmed during the presentations, allowing the trainers to effectively manage the debates, reactions, and questions.</p> <p>Nevertheless, the content might not be well adapted to the context and specific problems of the region.</p> <p>However, the reactions of learners from phases 1 and 2 differed. For instance, many participants from the park emphasized the need to contextualize marine biology and plastic waste and pollution in relation to the issues (overcrowding in the Scandola Reserve and negative externalities). Whereas for the professionals of the sea, "its general principles" have not been a problem. On the contrary, addressing the topics in this manner was even seen as helpful. Indeed, fishers may have strong emotional reactions if the presentation touches on a problem for which they might feel responsible. For the latter, the perspectives presented in the communication vignettes were highly interesting and elicited numerous reactions.</p>
Comments over Phase 2 session	<p>The questions addressed during phase 2 were highly general and were perceived as out of touch with the region's issues known by the two types of stakeholders from the previous phases (such as managing coastal area usage and inadequate or disregarded regulations). Depending on the territories and specific stakes or issues, it will be necessary to adjust the contents to focus them without digging into overly detailed specifics.</p> <p>Nevertheless, phase 2 serves as an interesting and applicable framework.</p> <p>The use of these materials also raises questions about the capacity of the trainer as a leader and facilitator in debates.</p> <p>This presupposes that the trainer possesses a comprehensive understanding of the issues at stake, enabling them to redirect discussions and guide the learners towards the development of a common ground, facilitating the discovery and sharing of mutually beneficial solutions.</p>
General evaluation from participants	<p>18/21 believe that the objectives of the project will be useful/very useful for the beneficiaries (fishers, aquaculture farmers and research world).</p> <p>14/21 think that the training program produced during the project will be useful/very useful in the future for training aimed at trainers/fishers/aquaculture farmers.</p> <p>Participants from both target groups noted that trainers need to have in-depth knowledge of the local context in order to make training more effective, as well as possess skills related to animating and facilitating discussions.</p> <p>The path therefore requires adaptation to the local context; however, the issues are absolutely relevant and central for the promotion of environmental sustainability in the sector. An in-depth study should also be dedicated to the legislative and regulatory aspects for the sector, at a European but above all local level.</p>

GREEN TO BLUE – Training pilot CATTOLICA – ITALY

Location	Online
Timing	Day 1- 27 th February 2024 – 1,5 hours with researchers and representatives Day 2 – 15 th March 2024 - 1,5 hours with fishers and fish farmers
Nr of participants	1 st day – 10 participants // 2 nd day – 6 participants in presence + 8 received the recording for impossibility to attend the live session
Participants // Target group	<i>Researchers' group:</i> 1 member of the "Cetacea Foundation"; 4 members of the "IRBIM-CNR"; 1 biologist Rimini fish market quality control; 2 researchers of the University of Bologna; 1 member of TAO (Turtles of the Adriatic Sea); 1 Marine Biology student who also works as a fisher. <i>Fishers/fish farmers' group:</i> 5 fishers, 1 fishers' representative. The 8 participants not able to attend are all fishers.
Nr and profile of trainer/s	2 trainers – marine biologists from M.A.R.E. coop; 2nd day saw the participation of 1 member from "Cetacea Foundation"; 1 project manager – Demetra Formazione.
Classroom structure	Online sessions – to facilitate the attendance of interested groups.
General feedback of trainer/s in conducting the pilot	The conduction of the pilot training has been quite smooth for both groups. <i>Fist group:</i> The contents proposed are familiar to researchers' group that highlighted the importance of investing in this kind of training to generate awareness on sustainability strand to safeguard the marine environment. The trainers adopted a peer-to-peer methodology with this group, soliciting specific discussions regarding the main critical issues encountered in the dialogue with sector operators and on the challenges to ensure a real adoption of virtuous behaviour regarding environmental sustainability at sea. <i>Second group:</i> a first session oriented to Phase 1 of the methodology, so introducing main concepts of environmental sustainability at sea, with a dedicated focus on climate change and plastic pollution. The second part dedicated to Phase 2 session, with an intervention of one fisher, who recounted his long collaboration experience with research institutions, to animate a debate on the dialogue among fishers / fish farmers and researchers.
Comments over Phase 2 session	Phase 2 was structured to focus on the positive experiences of fishers who have collaborated with researchers for years and how these can be developed over time to the benefit of all. The presence of trainers who belong to the category of researchers, as well as the speaker from the Cetacea Foundation, made it possible to address targeted discussions related to the problems arising from approaches and regulations that are not always clear and sometimes oppressive for operators in the sector. There are many meeting points, first the importance of working to safeguard the sea, which for fishers / fish farmers is a source of life for them and for their families/communities.
General evaluation from participants	During the realization of the pilot training the main comments recorded by participants belonging to <u>researchers/representatives' group</u> are the following: <ul style="list-style-type: none"> - Communication is a very crucial issue, to generate mutual trust among researchers and fishers / fish farmers, since the main difficulty in interacting between the 2 groups is mostly linked to the existence of stereotypes associated to the role of researchers perceived as adversaries or as guardians. - The regulatory framework (EU and national) should be treated to make fishers/ fish farmers understand that the rules are fundamental tools for the preservation of the seas, as well as contributing to the continuity of their specific activities. - It would be very useful to mutually build systems of interlocution that allow fishers understand the importance of information they share with researchers. Main comments recorded from <u>fishers' group</u> : <ul style="list-style-type: none"> - despite the need for a training course on sustainability issues, not all operators are willing to be trained. The initiative could be seen as a waste of time. - a great number of workers in the sectors consider the sea as their home and are glad to help in the protection of the marine environment. Despite this mindset, fishers/ fish farmers do not fully trust government and research entities. Often, they are not supported by port authorities and policy makers, even when they carry out positive sustainable actions (for example pay for marine litter caught and landed or the lack of ecological island in ports). - operators would like to be informed of the study's results to which they contribute and, above all, they ask for the recognition and remuneration (or tax relief) for their services.

GREEN TO BLUE – Training pilot ZADAR - CROATIA

Location	Poličnik (Zadar County) - Center for development and education
Timing	8 hours
Nr of participants	19
Participants // Target group	<ul style="list-style-type: none"> - shellfish farmers; - fishers; - representatives of the County - representatives of the Ministry of Agriculture (decision makers). Accent was in collaboration with the blue economy with decision makers to improve and implement nature conservation measures with minimal impact for business results of companies.
Nr and profile of trainer/s	1 trainer - Master engineer of marine fishery
Classroom structure	Conference room for 25 people (round table) equipped with adequate learning tools.
General feedback of trainer/s in conducting the pilot	<p>The structure itself seems to be quite good. Little too much material to be presented in one day workshop. Addressed questions were too general and the participants wanted to talk more about regional specific problems and challenges. For example, the shellfish farmers wanted to talk about reducing the plastic pollution in the sea caused by farming itself. Idea to solve that problem is to adopt new technologies and materials (biodegradable) with financial help from the County and the Ministry in charge.</p> <p>The trainer highlighted the need to in deep some pedagogical skills especially to support the presentation of specific materials to the less educated persons and manage their mutual interactions, so more facilitation skills are needed.</p>
Comments over Phase 2 session	<p>It is necessary to shorten up the general part of the course and widen up the territory specific part. Beneficiaries (participants) want to solve their own problems and they are not so hot to "save the world". Solutions that are brainstormed in this type of course where decision makers are participating must try to find the way to implementation.</p> <p>Overall, phase 2 is very applicable and can be used in other sectors in way of methodology and approach.</p>
General evaluation from participants	<p>17 out of 19 participants responded to the evaluation survey.</p> <p>Despite the good scoring assigned to the importance of the thematic treated in the training pilot (70% selected high or very high), only 59% think that the training program produced during the project will be useful in the future, this can be attributed to the need of addressing local contexts specificities more in detail, rather than discussing general frameworks on the green sustainability in the sector. This is also highlighted by the score assigned to the impact of the training provision on the real needs/problems of the target groups, that reached only 53% of positive responses (high-4, very high-5).</p> <p>The overall satisfaction reached a very good scoring – 94%, this is surely attributable to the phase 2 session, that allowed a real exchange and discussion among workers (fishers, fish farmers) and representatives/ institutional stakeholders.</p>

GREEN TO BLUE – Training pilot ATHENS - GREECE

Location	Online
Timing	3 hours
Nr of participants	10
Participants // Target group	The attendants of the pilot training were small scale fishers from different parts of Greece and postgraduate and doctoral students from the University of Thessaly. 38% were women and 75% are in the age range between 20 and 29. All of them possess at least a secondary education degree.
Nr and profile of trainer/s	1 trainer - The trainer who carried out the pilot training program is an ichthyologist with a master's degree in Fisheries Resource Management and Mediterranean Aquaculture. He works as Operations Project Manager at ENALEIA and has experience as a coastal fisher due to family tradition on small coastal fisheries.
Classroom structure	The presentation followed the template of the training material which was created after cooperation between the GtB participants. The training began with academic participants. A brief presentation of the topics was then made only to the fishers who were somewhat hesitant about whether they wanted to participate in the second phase.
General feedback of trainer/s in conducting the pilot	The pilot was a great success despite the difficulty of finding the ideal date due to the participants' commitments. However, the trainer managed to present the issues that were in the GTB presentations to both fishers, academics and then hold dialogue and activities to bridge the gap between these two groups. It was surprisingly heartening that at the end of the presentation some of the fishers exchanged contact details with the researchers for future collaboration on a project or any assistance they can provide for each other. Concerning the target researchers and academics, their active participation was encouraging enough for the rest of the pilot to roll smoothly. Characteristic was their interest in the economic solution that alien species and fishing tourism could provide, as they could also be a very important reason for new research. In relation to the target group fishers, despite a reluctance in the beginning to participate in the phase 2 and communicate with the academics, within the first few minutes the fishers opened to the other participants and immediately presented their problems and concerns about the sea. There were also moments when their point of view was completely different, but because of the problem-solving activities of the pilots we managed together to find solutions benefiting both sides. The pilot project was quite successful and should be applied to more fishers and academics. If we can bridge the gap between these two groups and create the perfect conditions for new research, new economic opportunities and a sustainable fishery.
Comments over Phase 2 session	As mentioned above, fishers were reluctant at first to communicate and accept the views of other participants. However, with proper dialogue and understanding it was clear by both sides that we cannot see an issue from only one perspective or from our own benefit. By understanding the other person's position and that sustainability to our profession comes only if we focus on the environment's sustainability, then even the most difficult minds can be changed. For example, the fishers' dissatisfaction with the issue of protecting the larger marine organisms such as turtles and dolphins was typical. However, after discussion we came to both sides understanding the importance of the species for each side. Both their positive impact on the environment and biodiversity conservation but also their negative impact on fisheries and the damage they cause to fishers. The conclusion is coexistence and that there should be areas where fishers do not fish but deposit part of their non-commercial catch to feed and strengthen the survival of these organisms only in these areas. Which could also bring more revenue to them as a product of fishing tourism.
General evaluation from participants	Concerning the organization of the pilot activity and the abilities of the trainer to stimulate interest in the subjects, explain and clearly deliver the contents, participants rated very highly these items – 88% rated the items with Very much (4) and A lot (5) scoring. Also, the methodologies adopted have been rated as effective with 75% of participants assigning score 4 and 5 to each of the methods (theoretical introductions, discussions and active participation, peer exchange). Main advantages of this kind of training activity have been identified in the immediacy and clarity of the presentation, the contagious educational staff and that the main environmental issues affecting fisheries were addressed. The most appreciated part has been the discussion and contribution of all participants, aside from the contents delivered, highlighting the importance of facilitation skills of the trainer as well as his competences and experience in the sector.

GREEN TO BLUE – Training pilot Rize - TÜRKIYE

Location	Recep Tayyip Erdoğan University Fisheries Faculty
Timing	2 hours
Nr of participants	13
Participants // Target group	The pilot test of the training was carried out with a group of participants in line with the project objectives. The group included scientists, the representative of the provincial directorate of the Ministry of Agriculture, who is one of the decision makers, and fishers and fishers' cooperative officials on behalf of their members. Thus, all 3 phases of the training were carried out appropriately and tested.
Nr and profile of trainer/s	2 1 Faculty Member 1 Aquaculture Engineer - Fisher
Classroom structure	Conference room for 100 people equipped with adequate learning tools.
General feedback of trainer/s in conducting the pilot	The training curriculum has been prepared to meet current needs very well. However, it has been expressed that some basic additions regarding aquaculture should be made in the fisheries management section. It has also been reported that the issues related to climate change (for example ocean acidification) are too complex to be clearly understood by fishers over a certain age and with a low education level, and that they need to be simplified a little more to be more understandable. In general, although the content is not 100% adhering to the specificities of the context at the regional level, the training is not boring, on the contrary, it is quite funny with brainstorming, various games, and communication skills activities. It was expressed that, by fisher, in the real training (not pilot), truly willing fishers should be selected and the number of policy makers within the group should be increased. It was also requested by the fishers that more photographic content should be included in the presentations.
Comments over Phase 2 session	Phase 2 is useful and interesting in technical terms. The idea that the question sections should be separate for the three groups to support different approaches within the entire training material was put forward by the participants. In other words, questions should be asked separately to 1. Fishers and Aquaculture Sector Workers, 2. Scientists, and 3. Decision Makers.
General evaluation from participants	As of the evaluation questionnaires, participants rated very positively the pilot activity, in particular 92% of them scored very much (4) and a lot (5) the benefit that this kind of training proposal can have on both target groups (fishers/fish farmers and researchers/stakeholders), confirming the usefulness of the contents proposed to increase the competences of sector operators. Same goes for the impacts that this training proposal can generate on the needs of the fishery and aquaculture sector. During the pilot activity, fishers stated that the training material was of high quality and interesting, requesting for more integration of visual materials. They mentioned that their economic situation is important, but they also gained ecological knowledge thanks to such training, since the training material includes the basic topics they need. Another important point they wanted to highlight is that such training should be applied not only to fishers but also to the society in general, starting from childhood. Scientists, on the other hand, stated that the training material was sufficient and focused on results without creating confusion. They emphasized that coming together with fishers and decision makers is the right approach, stressing the need to increase the frequency of such meetings. The official who attended on behalf of the decision makers stated that everything was fine on paper in terms of laws, rules and training, but there were always various problems in terms of sustainability. They stated that if sustainability is achieved, it will achieve its purpose and success.

Useful tips and indications for the successful implementation of GREEN to BLUE training activity

Tips to successfully deliver the "GREEN to BLUE" training programme



Planning

1. The flexibility of the programme allows you to use modules separately, so use the modules according to the specific needs of your target group;
2. Select the right trainer, which has to possess not only thematic expertise, but also be aware of the context specific needs and facilitation skills.

1. When involving participants, make sure that everyone is clear about the objectives of the process and the phases it involves, so as to allow real participation also in the comparison and discussion component;
2. For fishers / fish farmers: compose the group in order to bring together people with homogeneous experiences and knowledge on the topic (same entry level).



Group creation



Delivery

1. Together with content specific knowledges, make sure to use skills in facilitating discussion groups;
2. Be ready to adapt the contents proposed to cases in the local context (examples, good practices – IOI, etc.), animating discussions with the class group.

1. Take advantage of the evaluation from both trainers and participants to further adapt the GtB training course to the needs of your territory;
2. It is recommended to verify the impact of training over time, through direct interviews with participants, in order to verify the adoption of sustainable behaviors in the workplace (e.g. participation in pilot projects for the protection of the sea, adoption of sustainable fishing, etc.)



Evaluation

c) Recognition of the competences for the profile

The training standard developed through the Green to Blue project, due to the contents proposed and the expected duration, allows us to work in 2 different systems:

- in integration of existing formal training mechanisms; and
- in the so-called non-formal training.

The training programme, despite having been structured to be carried out with course activities in terms of training design, assumes a non-formal nature due to the methods with which it is delivered to respond to the specific needs of the sector, offering short training and with adapted methodologies that take as reference dynamic methods of comparison and discussion between trainer and learner and participatory methods between learners (see the two-phase delivery method proposed by the program).

The different systemic approaches derive also from the possibility of each of the participating countries to meet the criteria of their national/regional professional qualification framework.

Starting from the non-formal training, the Green to Blue programme will assume this form in those countries where no specific reference to national qualification frameworks can be found, as for example Türkiye, or even in those countries where the regulation does not allow the training providers to certify the training activities with short duration as part of a more structured training offer, such in the case of Croatia.

By non-formal learning we mean learning that occurs through different activities, which can also take the form of courses and seminars, but which do not provide for the award of a qualification despite being undertaken by the individual with learning purposes.

Another fundamental element to be considered is that of understanding which is the expected learning outcome. The approach that guided the Green to Blue consortium is that of working both on the knowledge base, but most of all on the acquisition of technical and cultural behaviours on the part of (future) professionals in the sector – fishers and fish farmers. For this reason, the focus is not in obtaining formative credits, but in increasing the professional qualification of the person.

Recognizing the learning only of those who have successfully completed a course of study is partial because in practice people also learn in many other ways such as:

- autonomous study (books, internet, etc.),
- attendance at activities with educational value (e.g. conferences),
- direct experimentation with the activities one wishes to learn (for example testing a specific technique),
- observing other people at work,
- exchanging ideas with colleagues or experts.

The idea behind the recognition of non-formal learning is to develop systems to certify (i.e. verify and give social value through the release of an official document with legal value) what

the person has learned or has learned to do (i.e. the result), regardless of the methods used (i.e. the learning path followed).

The certification of non-formal learning responds to the right of every person to have their learning recognised, however acquired. On the other hand, it facilitates the valorisation and development of human capital, as it makes non-formal learning explicit and gives dignity, thus allowing its further development and integration with formal learning.

Considering the formal learning system and the related recognition mechanisms, this can apply only in those countries where a national / regional repository is available and a specific formalization and certification system is running. The Green to Blue programme positions itself in the framework of a training proposal that integrates the existing courses dedicated to the professional profile of fisher and fish farmer. In particular, the consortium considers the professional qualifications linked to EQF 3 level those with a highest need in terms of renewal of the training contents in relation to the environmental sustainability and "green culture", as for example in the case of the Italian professional qualification of "Fishery and aquaculture operator" that is structured to have technical competences and knowledges associated to the profile, but with poor focus on the environmental sustainability elements which are fundamental to operate in the sector.

The objective of the recognition system envisaged by the Green to Blue project is to give evidence of the fact that the person can carry out a certain profession or certain tasks according to a pre-established optimal level despite not having followed the prescribed course of study, or when a specific study path is not foreseen.

When we talk about certifying the optimal performance of a profession or task, we make a change of perspective and analyse and highlight not the learning results but the person's performance or ability to operate according to a specific culture and skills - in our case related to environmental sustainability and the culture of sustainability in fishing and aquaculture operations.

In summary, we can speak not of 'certification systems for non-formal and informal learning' but instead of 'systems for recognizing good professionalism in carrying out tasks or professions', in a logic of adaptation to the contextual conditions that concern the specific profession, such as sea pollution, climate change, etc.

Given that currently there are no professional profiles of fisheries and aquaculture operators that are aligned with the contents proposed by Green to Blue, it is necessary to adopt a "light" recognition system, which is therefore based on the issuing of participation certificates with content descriptors treated and the methods of attendance of the Green to Blue path. In this way, the recognition system adopted is homogeneous among all partners, given the differences in the country.

The hope, on the one hand, that the countries that do not yet have a system of repertoire of qualifications and professions aligned with the EQF will soon be able to adapt their education and training systems with respect to sea professions, while on the other that in countries that already have these professional coding systems, appropriate adjustments are made to existing

professional qualifications to update them to contextual changes in the sector (digitalisation, green transition, regulations, etc.).

A proposal for the development, evaluation, formalization, and certification of skills has been elaborated by the consortium and will be shared with relevant stakeholders, mainly public institutions dealing with education and training at local/national level.

Here below the proposal.

References for the development, evaluation, formalisation, and certification of skills – “Sentinel of the Sea” profile

Module 1. Marine Biology	
SKILLS // ABILITY	INDICATOR/S
<ul style="list-style-type: none"> - Apply professional fishing techniques in compliance with the principles of environmental sustainability, taking into account the different types of ecosystems and species. 	<ul style="list-style-type: none"> - Implementation of fishing and farming operations by adopting sustainable techniques and models
EXPECTED LEARNING OUTCOME	
<ul style="list-style-type: none"> - Raised awareness of the concept of shelter and how this can enhance the work, by also understanding the importance of specific marine ecosystems and species and the role played by organizations working in the field of marine biology. 	

Module 2. Fisheries management	
SKILLS // ABILITY	INDICATOR/S
<ul style="list-style-type: none"> - Adopt a sustainability-oriented mindset in daily operations and promote a change aimed at sustainability (people, planet, profit) for the enterprise and for the sector. 	<ul style="list-style-type: none"> - Implementation of sustainable working practices in everyday activities.
EXPECTED LEARNING OUTCOME	
<ul style="list-style-type: none"> - Understanding the importance of proper and sustainable fisheries management, what can help catches and what reduces them, also by adopting problem-solving approaches. 	

Module 3. Plastic pollution	
SKILLS // ABILITY	INDICATOR/S
<ul style="list-style-type: none"> - Ability to implement the right pollution prevention and recycling practices and recognize their positive effects on the marine environment. 	<ul style="list-style-type: none"> - Arrangement, recovery and maintenance of equipment; - Recovery of plastics caught at sea and disposal at port docks.

EXPECTED LEARNING OUTCOME
- Understanding on the concept of plastic pollution and its effect on work activities and environment.

Module 4. Climate change	
SKILLS // ABILITY	INDICATOR/S
- Capacity to take action either individually or collectively to address and be resilient to climate change, to improve every day professional and personal life.	- Implementation of working practices resilient to climate change.
EXPECTED LEARNING OUTCOME	
- Understanding the concept of climate change and its effects on work activities and the environment.	

Module 5. Communication, collaboration, and negotiation	
SKILLS // ABILITY	INDICATOR/S
- Capacity to establish strong communication relationships with each other and with their profession-related bodies and to create long-term collaborative relationships with each other and with related bodies.	- Internal and external communication - Verbal transmission of information content
EXPECTED LEARNING OUTCOME	
- Develop a comprehensive understanding of communication principles, rules, and negotiation strategies to effectively facilitate collaborative practices.	

Other recognitions

Another way of recognizing the effort of those fishers and fish farmers willing to invest in the sustainability of their activities and in the collaboration with researchers and academics could be considered aside the training component: labelling.

Various players in the Blue Economy ecosystem have highlighted the complexity of the panorama of eco-labelling systems, in constant development, and which sees the main certification systems (e.g. MSC, ASC) as difficult to apply or extremely onerous above all in the small-scale fisheries/aquaculture sector.

Some countries are moving, with targeted initiatives led by public institutions, to build an alternative to the label proposed by international organizations. Relational power processes in the form of alliances and the use of “low-impact” scientific resources have led to greater awareness and discussion about low-impact, small-scale fisheries and aquaculture, but there is

still a long way to go, especially if the virtuous projects developed over the years are not taken as a strategy and therefore do not become elements of structural planning to encourage the green transition in the Blue Economy.

A labelling system that rewards those businesses that actively collaborate with scientific research could be a solution to a defined issue of safeguarding small-scale fishing and aquaculture and promoting more environmentally friendly activities.

Defining the importance of fisheries and aquaculture is therefore linked to ongoing discussions on the sustainable use of fish resources. Sustainability in fishing and aquaculture is a controversial concept and the debates on it are many and currently highly animated due to climate change which is also strongly impacting the economic and sustainability component of the companies themselves.

Due to the many aspects that need to be considered when talking about environmentally sustainable fishing and aquaculture (by-catch, impacts on the seabed, CO2 emissions, ecosystem services provided, etc.), there is no agreement on what to prioritize and it is quite complex to evaluate the impacts of different gear and farming techniques for different fish species on different marine habitats. There is therefore room for negotiation and conflicting claims about sustainability, based on different scientific materials.

In line with the United Nations Sustainable Development Goals, in particular SDG14, it would be of great importance to develop a "sustainable" labelling system, where sustainable means the effort of small producers to question themselves and play a fundamental role as "Sentinels of the Sea", allowing these less well-resourced actors to gain significant influence, enabling them to co-create an alternative for the protection of our seas.

From the experiences, albeit limited, of alternative ecological labelling to international circuits, positive impacts have been recorded on operators in the small-scale fishing and aquaculture sector, impacts such as increasing awareness of their "low impact" practices, their increasingly strong positioning in political contexts and the strengthening of their collaborations with environmental NGOs and buyers oriented towards environmental protection. There was therefore evidence of how alliances focused on (re)defining and reclaiming "sustainability" can support and strengthen the position of small-scale fisheries and aquaculture in political and market differentiation contexts.

Furthermore, such a labelling – co-created by fishers/fish farmers, researchers, representatives and public institutions – could be an important item and added value in terms of attractiveness of the sector for younger generations. Younger fishers and fish farmers, with high educational background have a greater attention to the matter of environmental sustainability and often they face resistance from older workers and operators in the sector when discussing this issue, in some cases generating disaffection on this type of professions. The labelling system will then become a leverage to generate a cultural change and stimulate new entries into the sector by young people who want to carry out a profession in a sustainable way and attentive to the protection of marine resources.

CONCLUSION

The **Blue Economy** is the European Union's long-term strategy to support sustainable growth in the marine sector. Environmental sustainability as well as marine environmental awareness and education in the fisheries and aquaculture sector are important components for the long-term survival of the Blue Economy in the Mediterranean Sea. To achieve blue growth in Europe, highly qualified and skilled professionals are needed.

Training is important since the job has drastically changed over the years. As a result, **new knowledge and skills** are required to enable fishers and fish farmers to play a key role in the transition towards a more sustainable sector. The training provides a basic understanding of the marine environment, fisheries and aquaculture management, economics, relation with society and various other challenges.

The consortium has worked on orienting adults working in the marine sector towards a sustainable use of marine resources, in particular through awareness of all the actors around the concept of 'preservation of the sea', to generate a new figure of "**Sentinel of the Sea**" of fishers and fish farmers.

The development of the "Sentinel of the Sea" profile within the Green to Blue project marks a significant step towards addressing the multifaceted challenges faced by the fisheries and aquaculture sectors.

Inspired by the European Parliament's Resolution on '**Fishers for the Future**' back in 2021, where sustainability is to be achieved in a holistic meaning together with the improvement of labour conditions, health and safety, social inclusion and a fair standard of living, the consortium deems it of great importance to **improve the training offer for fishers and fish farmers that play a fundamental role for the social and environmental wellbeing of the coastal communities** devoted to fisheries and aquaculture, aside from their direct economic contribution.

The developed **training programme**, structured to be flexible and adaptable to the daily work, is unique in the sense that the course **jointly trains fishers and aquaculture operators in the Mediterranean Sea basin as well as decision makers and researchers** related to the sectors.

POLICY INDICATIONS

During the Green to Blue project, it became clear to us how essential it is to highlight policy indications that can further support the integration and sustainability of this innovative profile within European frameworks. Hence, the project consortium has come up with the following policy indications to guide policymakers seeking to address vocational education and training, career development, certification, upskilling, and more generally the growth of **a prosperous, societally accepted fishing and aquaculture industry that cares about the well-being of our seas:**

1

Alignment with European Policy Objectives.

The creation of the Sentinel of the Sea profile is in line with the European Parliament's resolution 'Fishers for the future', emphasising the need for sustainable practices in the fisheries and aquaculture sectors. Policymakers should continue to favour initiatives that promote environmental sustainability, social inclusion, and economic viability in these sectors.

2

Recognition of Non-formal Learning.

Acknowledging the value of non-formal learning is critical in certifying the skills and competences acquired by individuals participating in sustainable fisheries training initiatives like Green to Blue. Policy frameworks should support the establishment of recognition systems that validate the skills acquired through practical experience, self-study, and participation in non-traditional educational activities.

3

Integration into National Qualification Frameworks.

Efforts should be made to integrate the Sentinel of the Sea profile into national qualification frameworks across European countries. This integration facilitates the formal recognition of skills and competences acquired by professionals in the fisheries and aquaculture sectors, enhancing their employability and mobility within the European labour market.

4

Harmonisation of Qualification Recognition.

The pilot sessions revealed a widespread lack of recognition for the qualifications of fishers and fish farmers across the European Union. Policymakers should prioritise the establishment of a common recognition framework for these essential roles within the fishing and aquaculture sectors. This framework should facilitate mobility and ensure that qualifications align with evolving industry needs and sustainability standards.

5

Transposing IMO STCW-F into EU Directive.

To ensure comprehensive integration of sustainability efforts within the fisheries and aquaculture sectors, policymakers should consider transposing the International Maritime Organization (IMO) Standards of Training, Certification and Watchkeeping

for Seafarers (STCW-F) into an EU directive. This action will harmonise training and certification requirements across EU member states, promoting standardised education and skill development for marine professionals, including fishers and aquaculture workers.

6

Adopting Minimum Standards for Sustainable Fisheries Training.

Policymakers should adopt a minimum standard for sustainable fisheries training for all fishers, recognising the diverse roles and responsibilities onboard vessels. This standard should account for differences in rank and associated duties, ensuring that training programs adequately address the specific needs and challenges faced by individuals working within the fishing industry.

7

Partnership and Collaboration.

Policymakers should encourage collaboration between relevant stakeholders, including government agencies, educational institutions, industry associations, and research organisations. Multi-stakeholder partnerships can foster knowledge exchange, resource sharing, and the co-creation of innovative solutions to address sectoral challenges.

8

Support for Local Adaptation.

Recognising the diversity of coastal communities and marine ecosystems, policies should support localised adaptations of the Sentinel of the Sea profile and associated training programs. Tailoring initiatives to specific regional contexts ensures relevance, engagement, and effectiveness in addressing local challenges and opportunities.

9

Investment in Research and Innovation.

Policy frameworks should allocate resources for research and innovation initiatives that advance sustainable practices, technologies, and methodologies in the fisheries and aquaculture sectors. Supporting research efforts enhances the evidence base for policy development and facilitates the adoption of best practices by industry stakeholders.

10

Promotion of Environmental Stewardship.

Policymakers should promote a culture of environmental stewardship among fishing and aquaculture professionals, emphasising their role as guardians of marine ecosystems. Incentives, recognition schemes, and public awareness campaigns can encourage adherence to sustainable practices and foster a sense of responsibility towards marine conservation.

11

Capacity Building and Empowerment.

Policy makers should prioritise capacity building initiatives that empower fishing and aquaculture professionals to lead sustainable and resilient livelihoods. Access to training, financial support, and advisory services can equip individuals with the knowledge, skills, and resources needed to adapt to changing environmental and market conditions.

12

Policy Coherence and Coordination.

Ensuring coherence and coordination among relevant policy areas, including measures related to social welfare, labour rights, and working conditions alongside fisheries and aquaculture management, environmental protection, and regional development is crucial for fostering holistic and integrated solutions. Policymakers should strive for policy coherence to maximise synergies and minimise trade-offs in advancing sustainability objectives. This entails not only preserving marine ecosystems but also ensuring the fair treatment and safety of workers in the fisheries and aquaculture sectors. For instance, policies could aim to enhance labour standards, provide access to healthcare and social security, and promote gender equality in the workforce. By embedding social policies within broader sustainability initiatives, policymakers can effectively address the interconnected challenges of environmental conservation, economic prosperity, and social equity.

13

Simplified Regulatory Framework.

Participants in the pilot sessions expressed challenges in understanding the regulatory framework, particularly at the European Union level. There is a need for greater transparency and accessibility in EU regulations, with efforts focused on simplifying language and providing accessible explanations of the processes behind specific regulations. Policymakers should strive to demystify regulations and engage stakeholders in the regulatory process to enhance understanding and compliance.

14

Enhanced Collaboration between Research and Industry.

Moving from project-oriented collaboration to a programming model is recommended to foster closer cooperation between the research community and the fishing and aquaculture sectors. Policymakers should incentivise the uptake of best practices and innovations in sustainability and marine resource preservation. This can be achieved through targeted funding mechanisms, such as the inclusion of sustainability initiatives in Cohesion Funds, which support activities like the collection of plastics from the sea. By promoting collaboration and knowledge exchange, policymakers can accelerate the adoption of sustainable practices and technologies across the industry.

Fishers and aquaculture farmers who have actively collaborated with the world of scientific research for years, collecting data or hosting scientists on board, and those who want to start collaborating, must be recognized with a qualification. Now, in fact, these fishers/aquaculture farmers do not possess any qualification that demonstrates their commitment and do not enjoy any benefits other than those deriving from the reimbursements they acquire through spot projects which, once concluded, do not demonstrate the important contribution made.

It would be important, and this is one of the objectives of the Green to Blue project, to recognize fishers/aquaculture farmers with a certificate that proves their commitment and that gives them benefits for this reason (e.i. points on the fishing licence, points for participation in EMFAF tenders etc.)

15

Enhanced Training Programs.

Policymakers should prioritise the development of comprehensive training programs tailored to the Sentinel of the Sea profile. These programs should

incorporate modules covering marine ecology, fisheries and aquaculture management, plastic pollution, climate change, and effective communication and collaboration strategies. Continuous evaluation and updating of training content is hereby essential to ensure relevance and effectiveness.

Concluding remarks

There is clearly a value in enabling in the competences of fishers and fish farmers, as they play a central role in achieving the sustainability goals set out in EU policies.

Improving the training infrastructure of fishers and fish farmers in the EU enhances the capacities of the people in the industry and emphasises the pivotal role of EU policymakers seeking to address specific issues such as the growth of a prosperous societally accepted fisheries and aquaculture industry, and responding to emerging challenges like skills gaps, generational renewal, career prospects in a uncertain geopolitical and socio-economic climate, and a lack of trust towards the sectors.

In conclusion, the **Sentinel of the Sea profile represents a proactive response** to the evolving challenges and opportunities facing the fisheries and aquaculture sectors. By incorporating these policy indications into strategic frameworks, European policymakers can facilitate the integration, recognition, and sustainability of this innovative professional profile, contributing to the long-term resilience and prosperity of coastal communities and marine ecosystems.

ANNEXES

1. Glossary of terms
2. Green to Blue program and course package
3. Didactical material for training pilots