



AR-WG objectives, plan, selection procedure



Deliverable 8.2



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Abstract	This deliverable outlines the objectives and selection criteria for the Associate Regions Working Group (AR-WG), and is responsible for the quality assurance of the selection process for Associate Regions (ARs). Future updates will review AR activities, ensuring compliance with data protection protocols, and document ongoing AR project progress. The deliverable will be continuously updated throughout the project to track AR participation and ensure alignment with ULTFARMS objectives, culminating in a final report at the project's conclusion.
Keywords	Associate Region Working Group; Monitoring





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Executive Summary

Deliverable 8.2 of the ULTFARMS project outlines the activities, objectives, and selection criteria of the Associate Regions Working Group (AR-WG). The AR-WG is tasked with the quality assurance (QA) of activities, deliverables, and milestones related to the selection of Associate Regions (ARs) who responded to an open call for participation in the project. This document provides an overview of the selection process, from the initial applications to the final selection of AR candidates.

Once the AR's have been contracted and begin their work, additional updated version of this deliverable will include a review of the ARs' activity documentation, ensuring that all relevant permissions are secured and compliant with established data protection protocols. The selection criteria and methodology employed by the AR-WG are designed to ensure transparency and compliance with the project's standards.

This deliverable will be continuously updated throughout the lifecycle of the task to incorporate new developments and products. Final agreements reached as part of this process will be included in an annex, ensuring that all modifications and decisions are recorded accurately. The document serves as a key resource for tracking the progress and implementation of the Associate Regions' participation, ensuring alignment with the broader objectives of the ULTFARMS project.

The results of Task 8.2 will culminate at the end of the project with documentation presented in this deliverable with future versions including ongoing updates as the project evolves.



1. Description of ULTFARMS Project

The ULTFARMS project is focused on advancing the marine aquaculture sector, which faces growing pressures from various stakeholders, leading to increasing conflicts over the use of coastal and near-shore zones. These pressures are expected to significantly impact European aquaculture industries, driving them to relocate further offshore. As offshore energy and aquaculture industries adapt to this shift, they must address the logistical and environmental challenges posed by unprotected offshore environments. The global expansion of Offshore Wind Farm (OWF) capacity presents an opportunity for Low-Trophic Aquaculture (LTA) to co-exist in multi-use marine spaces. Establishing commercially viable LTA production within OWFs is vital for Europe to meet its aquaculture market demand of 14 million tonnes—9.47 million of which are currently imported—thereby increasing European self-sufficiency and reducing carbon footprints.

The ULTFARMS project is developing solutions to these challenges by implementing six pilot LTA sites in the North and Baltic Seas. A key aspect of the project is ensuring that the knowledge and innovations developed at these pilot sites are transferable and can be replicated in other regions. To facilitate this, external entities known as Associate Regions (ARs) play a crucial role. These ARs contribute to the dissemination and further development of the LTA solutions created by ULTFARMS in European waters and beyond.

At the timing of this version of the deliverable, five ARs have been selected through two structured open-call processes, based on criteria such as regional characteristics, project relevance, and alignment with the project's planned activities. These ARs, supported by cascading project funding, will actively participate in the co-design and co-management of their unique solutions with the expertise, support, and knowledge exchange with the currently deployed 6 ULTFARMS projects, providing additional venues for engagement and leveraging the expertise of the consortium partners. Their participation enhances the replicability of ULTFARMS solutions by incorporating local insights and facilitating the transfer of knowledge.

The ARs will benefit from shared insights, technological advancements, and hands-on support in areas such as design, species selection, fabrication, deployment, operation, and commercialization. The consortium will engage with the ARs through targeted activities, including training, workshops, and expert guidance, to help build capacity and enhance the skills and competencies of professionals in the blue economy. This collaborative effort aims to extend the impact of ULTFARMS, ensuring that lessons learned and innovations developed through the pilots are disseminated across Europe's marine and aquaculture sectors.



2. ULTFARMS' Associate Regions

The solutions developed and demonstrated within the EU project "ULTFARMS", grant agreement number 101093888, involves the implementation of low trophic aquaculture farms within offshore wind developments to evaluate the environmental and economic suitability of such efforts. These solutions include industry standard as well as novel constructions and take into consideration nature inclusive design parameters. Deliverables 1.1 and 1.4 of the ULTFARMS project outline the scope of the first and second Associate Region calls, respectively, including the scope of the participation of these groups. A brief summary is provided below in this section, along with denoting the scope of work of the two Associate Regions selected in the first call, and the three selected during the second call.

The first open call was widely published, leveraging the project's communication and dissemination tools and channels. It was announced on the EC's Funding & Tenders Portal, the ULTFARMS project website, and promoted by project partners to reach relevant stakeholders. The call adhered to EU standards for transparency, equal treatment, conflict of interest, and confidentiality, remaining open for at least two months. After the initial submission period, a preliminary assessment was conducted to ensure sufficient applications met the acceptance criteria. The call remained open with rolling evaluations until the target of selecting at least five ARs, with a maximum funding of 100,000 Euros per proposal, was achieved. Changes to submission deadlines or other requirements were promptly communicated to all applicants and published on relevant platforms, this included a one-month extension of the call as there was insufficient response in the 2-months that the call was posted. During this time, there was a help section and details posted on the ULTFARMS website (<https://ultfarms.eu/associate-regions/>) and a live webinar and Q&A was hosted to aid any potential applicants (<https://vimeo.com/923292085/ccd48018d4>). Ultimately, two ARs were selected and awarded funding. The selection of the two successful ARs in the ULTFARMS project was based on specific criteria to ensure the commercial feasibility and innovation potential of the demonstrated Low-Trophic Aquaculture LTA solutions. AR candidates were required to submit proposals detailing activities at the local or regional level, with a budget of up to 100,000 Euros. These activities needed to align with the project's goals of co-designing and co-developing LTA solutions, utilizing the technical and operational expertise of the consortium. Key selection criteria included the ability of the ARs to participate in project discussions, attend training sessions, and engage in knowledge exchange. Each AR project was expected to contribute to a roadmap for rolling out LTA solutions in their respective regions and plan a public or industry engagement event to raise awareness and promote the project's innovations. The goal was to extend the impact of ULTFARMS' findings beyond the primary regions, ensuring a broader reach and faster adoption of LTA methods.



3. Status of Associated Regions Call

After the first round of the open call for Associated Regions, only two of the applicants from a pool of five proved to match the required criteria that were listed within the scope of the call and received sufficient point scoring by the review committee to be able to proceed to a granting phase with the ULTFARMS Project. The content and scope of these projects are detailed in section 4.2 of this report. A second issuance of the cascading funding call for Associate Regions was launched in January 2025, following consultations with the European Commission via the Project Officer. This reissuance builds on the context of the initial open call but is strategically designed to refine the focus and extend the impact of the ULTFARMS project's key innovations, given the shorter timeline that would be available to such endeavours. While maintaining the original scope of promoting the integration of Low Trophic Aquaculture (LTA) systems and the multi-use of marine spaces, the second call places a more deliberate emphasis on the exploitation of project results, enhancing the adaptability of ULTFARMS solutions across new and diverse regions.

The core objectives of this new call are twofold. First, it aims to support detailed desk studies to assess the feasibility and suitability of deploying ULTFARMS-developed solutions in additional regions, particularly in regions where the industry and feasibility or suitability of deploying such systems has been explored to lower extents, particularly in the Mediterranean. These studies will help map out environmental conditions, technical requirements, regulatory frameworks, and the socio-economic landscapes needed to effectively implement LTA systems and offshore renewable energy integration. By conducting such feasibility assessments, the call seeks to ensure that the methods, technologies, and lessons learned from the project can be tailored and applied to different marine environments, particularly in emerging LTA regions.

Second, the call will significantly ramp up capacity-building efforts, targeting regions that are in the early stages of adopting LTA practices or those with significant potential for developing sustainable aquaculture. The focus will be on equipping local authorities, industry players, research institutions, and other stakeholders with the skills, knowledge, and technical assistance required to deploy and scale ULTFARMS solutions effectively. This will involve not only the sharing of expertise but also workshops, training sessions, and collaborations with key project partners to build local capabilities for managing LTA systems, integrating renewable energy solutions, and addressing the unique challenges posed by offshore environments.

Moreover, this second call is expected to drive the long-term exploitation of project results by aligning ULTFARMS' outputs with regional development strategies, blue economy growth plans, and international sustainability goals. Associate Regions selected through this call will play a crucial role in demonstrating the scalability and adaptability of LTA systems in their respective regions, paving the way for future large-scale implementations and helping Europe to meet its sustainable aquaculture and renewable energy targets.



By enhancing the focus on the exploitation of results, the second call will ensure that the innovations developed through ULTFARMS are not only widely disseminated but also embedded into local and regional strategies for aquaculture and marine space use. This reissued call seeks to create a ripple effect, encouraging the uptake of sustainable practices and promoting multi-use marine environments, ultimately leading to a more resilient, environmentally friendly, and economically viable blue economy across Europe and beyond.

The potential, scope, and timelines for this second call have been discussed and developed in coordination with the funding agency and representative to ensure compliance with regulations and requirements set forth in the granting agreement in September 2024. The call was launched in January 2025 and remained open for 2 months, until 30th March 2025.

During the second call round, five new applications were received and three applicants met the criteria outlined in the call and received sufficient scores from the review committee to advance to the grant phase of the ULTFARMS Project. The content and scope of these projects are detailed in section 4.3 of this report.

4. Status of Accepted Associated Regions

Following their acceptance in the first call, the two selected Associate Regions updated the timelines for their respective scopes of work and finalised their contracts with Deltares, the lead organization for the AR Working Group within the ULTFARMS project. These updated timelines reflect any necessary adjustments to align with the broader project objectives and the specific requirements outlined in each Associate Region's proposal. The three Associate Regions selected during the second call have started the contracting phase with Deltares in the summer of 2025.

Presentation and welcoming of ARs to ULTFARMS

The Blue Mission BANOS event Mission Arena #3 in Amsterdam, Netherlands held on November 26-27, 2024 served as a platform for onboarding and introducing the two Associate Region (AR) projects that had been selected under the ULTFARMS initiative up to that date. This event offered an opportunity to present and share the scope of the ULTFARMS AR projects within the broader context of the Mission Lighthouse CSA meetings, fostering synergies between the ULTFARMS initiative and the Blue Mission BANOS objectives and providing an opportunity for the other Mission lighthouse projects and initiatives to be exposed to the work to be undertaken and create links as needed.

During the event, the two ARs selected for ULTFARMS—one from Tunisia and another from Wales—had their project plans showcased at the ULTFARMS project stand with information packets and materials generated for the two cases. These projects were formally introduced to the wider Blue Mission BANOS community, enabling stakeholders from various sectors to gain insights into how the ULTFARMS ARs are addressing challenges related to sustainable aquaculture, environmental impact, and regional capacity building. Sharing the detailed scope of each AR project, highlighting how they will leverage ULTFARMS' expertise in LTA and offshore energy to address regional challenges and opportunities is key within this meeting. This will also explore how these ARs are planning to utilize ULTFARMS solutions in the context of their local ecosystems and economies and highlight the transferability and knowledge transfer moments planned within the project and highlighting those which are open and available to the wider community of practitioners and sectors of interest. In one of the knowledge exchange sessions the ULTFARMS project was leading, the outcomes of ULTFARMS and the specific AR activities were shared and discussed with other stakeholders, including policy makers, researchers, and industry experts. The aim is to align AR activities with best practices and lessons learned from other Mission Lighthouse initiatives.

By participating in the Blue Mission BANOS Mission Arena, the ULTFARMS ARs did not only showcase their projects but also contribute to the overarching goals of the BANOS mission, which focuses on promoting the sustainable use of the Baltic and North Sea basins. The event will further strengthen the collaboration between ULTFARMS and the Blue Mission BANOS lighthouse, creating a dynamic platform for



innovation, policy development, and the implementation of multi-use marine strategies across Europe. For more information on the event and the agenda, please visit <https://bluemissionbanos.eu/event/mission-arena-3-in-amsterdam>.

The AR from Wales, leading the CoSaris project, also took the opportunity to attend an in-person ULTFARMS consortium meeting held at Deltares on 25 November 2024, just before the Blue Mission BANOS event.

Additionally, both CoSaris and SELIMA, the two ARs selected during the first call round, were invited to attend the ULTFARMS 2nd General Assembly, held in Lisbon on 19-21 February 2025 and were introduced to the whole consortium during a dedicated session. These meeting served as a critical opportunity to introduce the regions to the core project team, align their activities with the ULTFARMS project's overarching goals, and ensure that their contributions integrate smoothly with the existing work streams. During these sessions, the group also began planning a series of workshops and knowledge transfer events, which are key components of the scopes of work for both Associate Regions. These workshops and knowledge-sharing moments will be designed to facilitate the exchange of expertise between the ULTFARMS consortium and the Associate Regions. They will cover a range of technical, operational, and strategic topics related to Low Trophic Aquaculture (LTA) systems, renewable energy integration, and marine spatial planning. The goal is to ensure that the regions are fully equipped with the knowledge and resources necessary to implement the innovations developed within ULTFARMS and adapt them to their local contexts. This collaborative process will foster capacity building and strengthen the partnership between the project and the Associate Regions, setting the stage for successful project outcomes.

The ARs onboarded during the second call round will be introduced at the third ULTFARMS General Assembly, which is planned to be held in Delft in 2026.



4.1 Quality Assurance Metrics

The quality assurance and support structure for the ULTFARMS Associate Regions is designed to ensure consistent progress, maintain high standards, and offer necessary guidance throughout the project. A key element of this support structure is the regular monthly meetings between the Associate Regions and the AR Working Group. These fixed sessions serve as an essential platform for collaboration and continuous improvement, providing a formal setting where the regions can seek support, provide updates on their activities, share results, and discuss any challenges or developments in their projects.

In these monthly meetings, the Associate Regions are encouraged to present the progress of their work, ensuring transparency and alignment with the project's objectives. The AR Working Group offers feedback and technical input, helping the regions refine their plans or adjust timelines as necessary. This consistent interaction fosters a dynamic working relationship where issues can be addressed promptly, and any deviations from project goals can be corrected early on. While these monthly meetings serve as the foundation of the quality assurance process, the structure is designed to be flexible. The Associate Regions can request additional meetings or specific technical support as needed. This adaptability ensures that regions have access to expert guidance and resources whenever they encounter technical or operational challenges beyond the scope of the regular sessions. The availability of supplementary meetings and support guarantees that the regions are not left waiting until the next scheduled meeting if urgent matters arise.

This proactive, flexible approach to quality assurance ensures that the Associate Regions are consistently supported, allowing them to execute their projects effectively while maintaining the ability to make adjustments in real-time. As the work progresses, the regions will also receive ongoing feedback, helping them to continuously refine their plans and improve their results, ensuring that the project delivers high-quality outcomes in line with the ULTFARMS objectives.

Furthermore the 2 interim and 1 final project checkpoints for the AR projects, discussed in terms of finance in more detail in the section below, provide a key moment to take larger stock of the ARs progress. During these review sessions, the AR Working Group and relevant project experts review the progress of the ARs, analysing both the achievements and any challenges encountered. This systematic evaluation allows the Working Group to provide constructive feedback and guidance, ensuring that the ARs are meeting quality standards and maintaining alignment with the overall project goals. The review process is also a valuable opportunity for the ARs to receive tailored support from experts within the Working Group and update 6 months plans for require technical, communication, or developmental support that would be required. In addition to reviewing current progress, these meetings serve a forward-looking purpose, not only in planning but to pre-emptively catch potential issues before they arise. Experts offer their insights to help develop proactive solutions to any problems that have emerged, ensuring that issues are addressed promptly. The collaborative nature of these discussions fosters a problem-solving



environment where potential risks or obstacles can be identified and mitigated before they escalate in the future stages of the project. By catching these issues early, the ARs can make necessary adjustments to their work plans, ensuring smoother implementation and a greater likelihood of long-term success. These regular reviews not only keep the ARs on track but also provide an essential framework for continuous improvement, ensuring that the projects evolve with the support and expertise of the ULTFARMS consortium.

Monitoring for Payments

For the quality control and assistance aspects of the Associate Region projects, a structured approach has been adopted, breaking down project deliverables and milestones into three distinct project terms. Each term will include clearly defined deliverables and milestones that must be completed before advancing to the next phase. This phased approach ensures that the progress of each Associate Region is closely monitored and aligns with the overall goals of the ULTFARMS project. These terms will require a summary report of the actions completed, deviations, and a summary of the project outputs to the end of each point. These reports are not intended to be exhaustive, thereby wasting the limited resources of the ARs, but allow for a formal method of tracking progress and accounting for expenditures so that sufficient evidence and rationale can be provided to the European Commission on the expenses incurred by the AR activities.

To support the Associate Regions effectively, payment will be released upon the successful completion of the tasks outlined for each interval. This method ensures that funding is provided incrementally based on achieved results, promoting accountability and steady progress. Additionally, this approach addresses the practical needs of the Associate Regions, particularly with respect to larger upfront costs, such as the purchasing of equipment or infrastructure investments required to implement Low Trophic Aquaculture (LTA) systems or renewable energy solutions.

By structuring the project in this way, the ULTFARMS team can provide the necessary financial flexibility for the Associate Regions, ensuring that they can cover critical upfront expenses while still maintaining a strong framework for oversight and quality control throughout the duration of the project. This milestone-based payment system ensures a balance between financial support and the timely delivery of results.



4.2 First Open Call

4.2.1 SELIMA Project – AR1

The SELIMA project, one of the two awarded Associate Region projects under the ULTFARMS first call, will be carried out in Tunisia. Its primary aim is to integrate a South Mediterranean region into the ULTFARMS project by utilizing the expertise of the consortium in OWF and LTA. The project will focus on several key areas.

First, it will involve capacity building for the SELIMA team, with members receiving extensive training in OWF and LTA through collaboration and discussions with ULTFARMS partners. This acquired knowledge will then be shared widely within Tunisia to benefit a broader audience. Additionally, the project will incorporate LTA techniques into the existing finfish aquaculture farm located in Beni Khiair, diversifying production by introducing species such as seaweed, molluscs, and echinoderms. This pilot is intended to be scalable and replicable. The SELIMA project is promoting the use of renewable energy sources in aquaculture operations in Beni Khiair. This will help reduce environmental impact and decrease dependence on fossil fuels and reduce overall carbon emissions in the chain of production. Moreover, the project will demonstrate the viability of cultivating LTA species under the oceanic conditions of Tunisia, considering factors such as temperature, salinity, dissolved oxygen, and water transparency.

The SELIMA project also aims to highlight the ecological benefits of cultivating LTA species, particularly for the restoration of marine ecosystems near future OWF sites in Tunisia. Finally, an important goal is to disseminate knowledge and raise awareness among relevant Tunisian stakeholders about the integration of OWF and LTA, using the expertise and strengths of the ULTFARMS consortium. Overall, the project seeks to diversify aquaculture production, promote environmental sustainability, and contribute to marine ecosystem restoration, positioning Tunisia as a key player in the region's blue economy.

The SELIMA Project aims to use the expertise of the ULTFARMS consortium to conduct feasibility studies, site experiments, and stakeholder engagement. Its goal is to determine the environmental, technical, economic, and regulatory conditions needed for successfully integrating low trophic aquaculture (LTA) techniques into the existing finfish farm in Beni Khiair, Tunisia. This pilot project is designed to be scalable and replicable, promoting aquaculture diversification. Additionally, SELIMA seeks to incorporate renewable energy into aquaculture operations to reduce environmental impact and dependence on fossil fuels. The project will demonstrate the effectiveness of LTA species cultivation under Tunisia's oceanic conditions and highlight its potential for restoring marine ecosystems, especially near future offshore wind farms. By working with ULTFARMS, SELIMA will also raise awareness and share knowledge about offshore wind farms and LTA among key stakeholders in Tunisia, promoting sustainable aquaculture and renewable energy practices in the region.

Methodology

The methodology for the SELIMA project incorporates several key components aimed at developing low-impact marine aquaculture and the multi-purpose use of marine space in Tunisia. These components include knowledge acquisition, desktop studies, in-field experiments, and knowledge dissemination. By working closely with project partners and local stakeholders, the project uses a co-design and co-development approach to achieve its objective of establishing sustainable aquaculture solutions. The demonstration case focuses on integrating fed finfish aquaculture with LTA, including organic extractive species that take advantage of particulate organic matter (POM) and inorganic extractive species (such as seaweeds) that utilize dissolved inorganic nutrients (DIN).

Additionally, the SELIMA project will explore the integration of renewable energy, specifically solar power, into aquaculture operations to reduce greenhouse gas emissions and lower the carbon footprint. This synergy between renewable energy and LTA will not only contribute to environmental sustainability but also increase economic profitability by enhancing circularity in the production system. Tunisia has already gained expertise in developing LTA through past projects like PATINER, which demonstrated the value of recycling nutrients from fish farming to grow high-value species such as *Gracilaria gracilis* and *Crassostrea gigas*.

The methodology is organized into five work packages and begins with an inception report to outline collaboration details and the co-development of activities between the AR and ULTFARMS partners. A desktop study will assess the feasibility of installing photovoltaic panels to power aquaculture operations, significantly reducing reliance on fossil fuels. The chosen site, the MEDORA fish farm, offers an ideal setting for this study, with the potential to replace diesel-powered pumps with solar-powered alternatives, ultimately reducing the carbon footprint. The results of this innovation will be presented to national and international stakeholders during a dedicated event, ensuring alignment with the ULTFARMS dissemination strategy and promoting the adoption of sustainable practices in aquaculture.

Expected Impacts

The SELIMA project aims to demonstrate the feasibility and positive impacts of integrating solar energy and low trophic aquaculture (LTA) within an offshore finfish farm. Through desktop studies and practical experiments, SELIMA will leverage the innovations developed by ULTFARMS to expand knowledge and practices into the Mediterranean, particularly in Tunisia. By combining floating photovoltaic (PV) systems with finfish aquaculture, the project will show that solar energy can power aquaculture operations, reducing reliance on fossil fuels, cutting costs, and minimizing environmental impact. The project will also illustrate how such integrated systems contribute to climate change mitigation by lowering greenhouse gas emissions, enhancing community engagement, and improving resilience to climate events.



Additionally, SELIMA will highlight the benefits of incorporating LTA, such as shellfish and seaweed farming, alongside finfish aquaculture. This integration will improve water quality by utilizing excess nutrients from finfish farms, provide natural biofiltration, enhance marine habitats, and offer diversified products, thus increasing economic viability and reducing environmental risks. The project's methodology demonstrates that these benefits can be scaled up and applied to future offshore activities, such as Offshore Wind Farms, which are anticipated in Tunisia in the coming years.

Overall, integrating low-trophic-level aquaculture with offshore finfish aquaculture can result in synergistic benefits that improve environmental sustainability, economic viability, and social acceptability of aquaculture operations. Based on the pilot site achievement, we will show that the benefits and positive impacts listed here above can be scaled-up, replicated and extended to other offshore activities like Offshore Wind Farms, that will be established in the few next years in Tunisia.

Capacity

The SELIMA project involves three key partners. INSTM, Tunisia's leading research institute in marine sciences and technologies, brings extensive experience from EU-funded projects, including the SwitchMed project, PATINER, and research on marine renewable energy. Their expertise spans fisheries, aquaculture, marine environments, and oceanography. MEDORA, a private fish farm and part of the Medimegh Group, is one of the most advanced fish farms in the South Mediterranean, specializing in seabass and seabream production. With cutting-edge technology and strict food safety certifications, MEDORA has collaborated with INSTM on developing low trophic aquaculture (LTA) systems. SEA-GUST, an SME specializing in marine science consulting and environmental data analysis, provides services for various blue economy sectors. Their expertise in numerical modelling, risk assessment, and marine ecosystem protection, combined with experience in EU projects, supports SELIMA's goals in sustainable aquaculture and environmental management.



Project timeline and implementation phases

Start and end dates: December 2024 (M1) – June 2026 (M19)

Phase and key activities	Delivery date
<u>Phase 1: Capacity Development, Co-design of the activities and technical and economic feasibility</u> Deliverable D1.1: Inception report Deliverable D2.1.a: Site Visit and Data Collection Interim Report Deliverable D2.2 : Literature Review Report Deliverable D2.3+D3.1: Technical and Economic Feasibility Studies Report Deliverable D4.1 : Stakeholder Engagement Plan Deliverable D5.1.a: Capacity Development and Knowledge Transfer Interim Report	 M2 M4 M7 M7 M10 M12
<u>Phase 2: Pilot implementation and monitoring</u> Deliverable T2.1: First Technical Interim report on pilot implementation and monitoring Deliverable T2.2: Second Technical Interim report on pilot implementation and monitoring Deliverable T2.3: Final Technical report on pilot implementation and monitoring	 M8 M12 M19
<u>Phase 3: Outcomes and Impacts of the project</u> Deliverable D2.1.b: Data Collection final Report Deliverable D3.2: Environmental & Social Impact Assessment Report Deliverable D4.2: Final Report on Stakeholder Engagement and Communication Deliverable D5.2: Capacity Development and Knowledge Transfer Final Report	 M19 M19 M19 M19

Full AR Proposals and evaluation sheets are available to reviewers and relevant European Commission Personnel upon written request to Deltares at ULTFARMS@deltares.nl



4.2.2 CoSaris Project – AR2

The CoSaris Project focuses on addressing the multifaceted challenges within the Irish Sea basin, an ecologically and economically important region managed by six different nations. The project aims to explore the potential synergies between renewable energy development and low trophic aquaculture (LTA), particularly shellfish farming, while considering the interactions with other sectors such as fisheries and the region's conservation obligations. By leveraging the expansion of renewable energy sites, including offshore wind and tidal energy, the project seeks to contribute to net-zero ambitions and foster blue and green economic growth. This involves increasing low-carbon food production alongside energy infrastructure, promoting the expansion of shellfish aquaculture, and supporting coastal livelihoods, all while minimizing ecological impacts through innovative management practices.

The Irish Sea is a highly productive and dynamic region, where development must balance the interests of various marine industries with the complexities of transboundary regulations, consenting processes, and regional policies. The central Irish Sea and the wider Celtic Sea have proven renewable energy capacity, particularly in wind, wave, and tidal energy, with several offshore wind farms already in operation. However, many of these potential renewable energy development sites overlap with prime fishing and aquaculture grounds, as well as Special Areas of Conservation and Protection. The Irish Sea is also notable for its natural productivity of low trophic bivalves, with established mussel and oyster industries in locations such as Wexford, Belfast, and the Menai Strait. The CoSaris Project will focus on ensuring that the biological, ecological, and environmental conditions needed to support these natural and cultivated populations are maintained while promoting sustainable development of marine resources in the region.

The CoSaris Project, as part of the ULTFARMS initiative, aims to advance the co-location of low-trophic aquaculture (LTA) and offshore wind farms (OWF) within the Irish Sea basin. This collaboration provides a unique opportunity to exchange knowledge and experience, fostering synergies between aquaculture and renewable energy sectors. As a UK-based partner, the CoSaris team sees this project as a timely chance to rebuild connections with EU partners and leverage the expertise gained from previous EU-supported activities in Wales.

The primary objectives of CoSaris are to facilitate the development of LTA alongside OWFs, benefiting from two-way learning with ULTFARMS partners on production protocols, water quality, and environmental interactions. The project will also focus on regional learning to inform effective governance, ensuring that the co-use of marine spaces is well-supported across all locations. This will contribute to the development of regional protocols, benefiting not only the UK and Ireland but also feeding back into the ULTFARMS network. Another key objective is to develop social license with marine stakeholders, particularly the local fishing industry, addressing spatial conflicts and ensuring acceptance of co-use developments. Finally, CoSaris will provide proof of concept for integrating ULTFARMS principles into new co-location sites, offering a model for expansion in the Irish Sea and other regions.



Building on Bangor University's extensive experience in co-developing sustainable shellfish aquaculture in the Irish Sea, the project will benefit from past initiatives like the Shellfish Centre and the Menai Offshore Systems project. The CoSaris team will use its expertise in offshore aquaculture to test scalable, environmentally sustainable methods that can enhance shellfish production in challenging open sea conditions. Through a series of interconnected work packages, the project will ensure collaboration, knowledge-sharing, and innovation across the ULTFARMS consortium, supporting the long-term goals of sustainable aquaculture and renewable energy integration in the region.

Methodology

The CoSaris project has identified several key knowledge gaps that need to be addressed in order to successfully implement LTA alongside OWF in the Irish Sea. One major issue is the spatial squeeze caused by the limited availability of coastal sites, as much of the Welsh coastline is under conservation designations or military use. This has motivated shellfish producers to explore offshore locations, but determining the suitability of co-locating LTA with OWF requires deeper analysis of hydrodynamic conditions, site selection criteria, and the practical challenges of shared marine spaces. Another significant knowledge gap lies in governance, as successful co-use of marine areas depends on engagement and cooperation between OWF operators, LTA developers, and other marine users. Establishing frameworks for governance, risk management, and stakeholder collaboration is crucial, as is maintaining social license through trust-building and clear communication about the environmental and socio-economic impacts of co-use. In terms of technical feasibility, the project must address the logistical challenges of operating in offshore conditions, where weather, wind, and tidal forces are more severe. The costs and complexities of maintaining and harvesting offshore shellfish farms in tandem with OWFs are still uncertain and require further exploration through pilot projects and technical innovations.

Water quality is another uncertainty, as inshore Welsh waters often face pollution challenges, although initial studies suggest that offshore conditions offer better water quality for shellfish farming. This will require ongoing monitoring and collaboration with local water management authorities to ensure long-term viability. Additionally, the overlap of aquaculture sites with conservation designations presents challenges for environmental impact assessments, with gaps in environmental data potentially delaying consenting processes for offshore LTA developments. Finally, the project must address concerns around invasive non-native species (INNS), as introducing artificial structures like OWFs and aquaculture farms could facilitate the spread of these species. Appropriate monitoring and mitigation strategies need to be developed in collaboration with regulators. Furthermore, building the case for wider environmental benefits, such as the restorative potential of LTA species, will be important in promoting social license, streamlining the consenting process, and



attracting green investment. These knowledge gaps highlight the need for comprehensive research and collaboration across sectors to ensure the success of the CoSaris project and the broader adoption of co-located LTA and OWF in the Irish Sea.

Expected Impacts

The CoSaris Project is expected to generate significant impacts by developing methodologies and frameworks for risk management in co-locating LTA operations with OWF. This work will ensure that any lessons learned and solutions developed are transferable across different regions, providing a common understanding of the practical barriers to co-use of OWF sites. By incorporating ECOWind-ACCELERATE into the project, communication between LTA and OWF operators will be enhanced, creating greater potential for collaborative governance structures that optimize the use of marine space. Offshore shellfish farming, a central component of the project, will contribute to reducing the carbon footprint of food production by offering low greenhouse gas emissions, similar to plant-derived proteins. Shellfish farming requires minimal energy and no feed inputs, making it an ideal solution for decarbonizing the food sector while also addressing food security and supporting coastal livelihoods. However, successful development will require investment in both the production systems and the necessary infrastructure to ensure market access. Wales, with its vast marine area and relatively low levels of economic activity in certain regions, offers great potential for this sustainable approach, though much of its marine space is under environmental protection. With careful site selection, shellfish aquaculture can be fully compatible with these designations, potentially yielding over 200,000 tons of raw material annually from less than 1% of Welsh waters.

The integration of the Irish Sea into the ULTFARMS network adds a unique dynamic to the project, as the region is home to numerous operational wind farms with additional developments planned. With Bangor University's extensive experience in low trophic aquaculture and close ties to the shellfish industry, the CoSaris Project will benefit from the lessons learned across ULTFARMS regions while contributing valuable insights of its own. By fostering collaboration and knowledge exchange, the project aims to enhance understanding and improve production protocols, environmental management, and water quality monitoring across both Irish Sea sites and other ULTFARMS locations. The project will also explore practical solutions for co-location, using ongoing commercial trials in Welsh waters as case studies. For instance, shellfish farming adjacent to the Gwynt y Môr OWF site is being tested as a low-impact way to share marine space, providing valuable insights into how full-scale commercial co-use can be achieved. If successful, this approach could be expanded to additional wind farm developments in the region, such as the Awel y Môr site, creating a model for broader co-location efforts across the Irish Sea and other regions.



Engagement with stakeholders, particularly those in the fishing industry, will be critical for ensuring the social acceptance of co-use developments. The CoSaris Project recognizes the significant impact OWF developments have had on local fisheries, particularly through the loss of fishing grounds. One potential solution is to involve displaced fishers in LTA activities within OWF sites, offering pre-consented aquaculture operations as a way to maintain economic viability. This co-creation approach, supported by ULTFARMS, could shift perspectives and open up new opportunities for both OWF operators and the fishing community. Overall, the CoSaris Project aims to develop a sustainable and mutually beneficial model for co-use of marine space that can be applied in the Irish Sea and beyond.

Capacity

The CoSaris project will be implemented by a highly experienced team from Bangor University's School of Ocean Sciences, with over 10 years of expertise in offshore aquaculture and offshore wind research. Bangor University, known for promoting economic, social, and cultural development, has a strong track record in delivering large, collaborative projects focused on climate change and sustainability, which aligns with its long-term strategy. The project will be primarily based at Marine Centre Wales, utilizing the university's resources to carry out research activities and ensure successful implementation.

Led by Professor Lewis Le Vay, Director of the Centre for Applied Marine Sciences, the project team includes notable researchers such as Professor Katrien Van Landeghem, Dr. Julie Webb, Dr. Chris Unsworth, Professor Shelagh Malham, and James Wilson. These experts bring a wealth of experience in marine geology, environmental evidence gathering, offshore aquaculture operations, stakeholder engagement, and governance frameworks for co-located aquaculture with offshore wind farms. Their combined expertise ensures that the CoSaris project is well-positioned to deliver on its objectives of developing sustainable low-trophic aquaculture in conjunction with offshore wind energy in the Irish Sea.

The project will benefit from Bangor University's existing infrastructure, such as the co-leased pilot offshore mussel longline system, and Marine Centre Wales, providing the necessary facilities and resources for innovative applied marine research. CoSaris will leverage these assets to strengthen relationships with marine industry partners and stakeholders, contributing to the successful integration of aquaculture and renewable energy in the region.



Project timeline and implementation phases

Start and end dates: November 2024 (M1) – June 2026 (M20)

Phase and key activities	Delivery date
Phase 1 Deliverable 1: Report on development of operational checklists Deliverable 2: Report on evidence supporting social license Deliverable 3: Report on site characterization and suitability	M12 M12 M14
Phase 2 Deliverable 4: Report on progress in the site consent applications Deliverable 5: Roadmap for co-located LTA in the Eastern Irish Sea	M19
Phase 3 Deliverable 6: Report on workshop outcomes	M20

Full AR Proposals and evaluation sheets are available to reviewers and relevant European Commission Personnel upon written request to Deltares at ULTFARMS@deltares.nl



4.3 Second Open Call

4.3.1 SymbioSea Baltic Project – AR3

The SymbioSea Baltic project will be carried out in Latvia. Latvia is one of the nine countries bordering the Baltic Sea, with nearly 500 km of coastline split between the open sea (Baltic proper) and the sub-basin Gulf of Riga. In Latvian Maritime Spatial Planning (MSP) there are five offshore wind park zones. An Environmental Impact Assessment is currently underway for the ELWIND offshore wind energy project in the Latvian offshore area.

The Baltic Sea, characterized by brackish waters and slow water exchange, is a highly sensitive environment that recovers slowly. Elevated nutrient levels in the water contribute to eutrophication, a process that poses significant challenges, particularly in coastal regions and areas with limited water circulation. The detrimental effects of eutrophication such as oxygen depletion, harmful algal blooms, loss of biodiversity, and reduced underwater light availability underscore the urgency of addressing this issue. The effects are felt most strongly in coastal areas. On top of that, local fish stocks have declined, putting pressure on small fishing communities. One promising way forward is multi-use, which would combine offshore wind with Low-Trophic Aquaculture (LTA), like macroalgal or mussel farming. This combination can deliver numerous benefits, including ecosystem services, while providing local fishing communities with the opportunity to diversify or transition to more sustainable practices, such as cultivating macroalgae or mussels. As highlighted in the Latvian Marine Spatial Plan, integrating seaweed and shellfish farming into offshore energy zones can provide multiple co-benefits such as supporting biodiversity, removing excess nutrients, offering new livelihoods for coastal residents, and improving public perception of wind farms by showcasing environmental co-use. However, to realize this vision, there is a need for structured knowledge transfer, regional capacity-building, and tailored feasibility assessments.

SymbioSea Baltic aims to provide evidence-based knowledge on the feasibility and potential benefits of establishing annual LTA cultivation in offshore eutrophic brackish waters as a mean for the simultaneous provision of ecosystem services and business opportunities. Considering that the first offshore wind park in Latvian marine waters is still in the planning phase, the project offers the opportunity to apply the most novel and feasible technologies and approaches, including social ones, from the very beginning.

The main objective of the project is to raise the capacity of regional authority and municipalities as relevant actors and stakeholders when implementing the multi-use of the planned ELWIND offshore wind energy project. SymbioSea Baltic will use Multi-Criteria Decision Analysis (MCDA) to evaluate the feasibility of LTA integration into the ELWIND offshore wind zone. Environmental, technical, economic, and social dimensions will be considered, ensuring a holistic assessment of real-world viability.



To support long-term viability, the project will also explore value chain options for algae, and mussels based on ULTFARMS partner experience, such as biostimulant production, feed, and low-carbon materials. Insights will also draw from the project lead's prior work on Baltic seaweed biorefinery concepts and sustainable extraction techniques by the project coordinator.

Methodology

SymbioSea Baltic applies a structured and interdisciplinary methodology combining desk-based research, stakeholder co-creation, and data-driven analysis.

The desk study will begin with a thorough review and synthesis of ULTFARMS pilot results, supported by scientific literature and relevant national and EU-level policy frameworks. To identify the most promising technologies and configurations, the study will apply Multi-Criteria Decision Analysis (MCDA). This structured method allows for a transparent and comparative assessment of LTA options, considering criteria such as ecological compatibility, biomass productivity, value chain potential, stakeholder acceptance, legal feasibility, and synergy with existing offshore wind infrastructure. This process will also account for seasonal variability, logistics, and monitoring needs. Considering the specific conditions of the Baltic Sea and the Gulf of Riga (low salinity and low number of species available for LTA), the study will describe choices of low trophic level organisms to be cultivated.

The project will moreover integrate life cycle thinking to explore sustainability implications across of Multi-Use. While no primary data will be collected to support a full LCA, the project will outline an life cycle thinking framework, identifying key parameters and potential environmental impacts. This preparatory work will help guide future full-scale assessments and align with best practices in sustainable marine planning. The analysis will be supported by existing LCA studies from comparable projects and literature, providing context on carbon removal, eutrophication mitigation, and circular economy pathways.

The outcome of the study will be a context-specific, evidence-based evaluation of LTA feasibility in the ELWIND area, supported by technical data, policy analysis, and stakeholder inputs.

Expected Impacts

The collected data is easily adaptable and applicable across all three Baltic States due to their geographical location. Additionally, some collected data and methodologies can be adapted for use in other regions, further extending the long-term impact of the project. This initiative provides lasting benefits to the region by delivering scientific justification and raising awareness about the sustainable use of renewable resources. It will help attract new stakeholders who can enhance the sector's capacity and implement initial pilot projects. Furthermore, the project will promote public understanding of environmental sustainability by supporting ecosystem restoration and improvements following offshore wind park construction.

Capacity

The SymbioSea Baltic project will be implemented by a consortium of three leading experts in their respective fields in Latvia, with a strong foundation of prior collaborations in previous projects.

RTU Liepaja Academy (RTU LA) has conducted several research projects and publications, with expertise on macroalgae, biorefinery, and industrial symbiosis. RTU LA will lead the coordination and research work in this project, and contributes expertise in the adoption of technical solutions MCDA, life cycle assessment, industrial symbiosis, and the advancement of LTA biomass potential.

The Latvian Institute of Aquatic Ecology (LHEI) focuses on marine ecosystem health, restoration, and sustainable solutions. LHEI will provide local ecosystem knowledge, advice on LTA system deployment, and species selection.

Kurzeme Planning Region (KPR) is a regional public institution representing 8 municipalities, including coastal and port cities. It coordinates regional planning and supports project implementation in the Baltic Sea area.

Project timeline and implementation phases

Start and end dates: June 2025 (M1) – June 2026 (M12)

Phase and key activities	Delivery date
Phase 1: Desk study and scientific knowledge transfer Deliverable 1.1: Submission of research article in Q1/Q2 journals. Deliverable 2.1: PDF brochure showcasing Multi-Use LTA opportunities.	M12
Phase 2: Communication and dissemination Deliverable 3.1: Report on the Blue Bioeconomy Forum event	M12
Phase 3: Awareness and capacity building Deliverable 4.1: End report on all project activities.	M12

Full AR Proposals and evaluation sheets are available to reviewers and relevant European Commission Personnel upon written request to Deltares at ULTFARMS@deltares.nl



4.3.2 ULTAN Project – AR4

The ULTAN project is based in the Municipality of Ustka, Poland. This municipality is well-positioned as an Associate Region due to a combination of factors: a planned offshore wind farm, expected to be operational by 2030, presents an opportunity to integrate community-driven initiatives. Local fishermen will be directly involved in servicing the wind farm, with a dedicated service base in the Port of Ustka set to begin construction in 2024. There is also growing interest in LTA as a response to overfishing, the eutrophication of the Baltic Sea, and the economic challenges facing the fishing industry. Additionally, rising tourist demand for locally sourced products supports the development of LTA.

Poland's EEZ has significant offshore wind energy potential. The Port of Ustka has been selected by PGE Baltica as the site for a service base supporting the planned offshore wind farms, with construction beginning in 2024. These planned offshore energy developments create opportunities for multi-use low-trophic aquaculture, addressing environmental challenges in the EEZ, such as dead zones caused by agricultural runoff of nitrates and phosphorus.

The Polish coast has strong production potential for *Fucus vesiculosus*, a valuable dietary supplement, while the viability of mussel farming is being explored. The introduction of *Mytilus trossulus* at pilot marine farms across the Baltic indicates promising results. The remediation potential of these aquaculture initiatives is also under investigation in the southern Baltic Sea. Seaweed species such as *Ulva intestinalis* and mussels like *Mytilus trossulus* help remove nitrates and phosphorus from the water, improving light conditions for autotrophic organisms, reducing harmful phytoplankton blooms, and mitigating cyanobacteria-related toxicity. Large-scale cultivation could significantly impact the environment by curbing eutrophication and enhancing biodiversity.

Over the 20th century, excessive nitrogen and phosphorus from agricultural fertilizers flowed into the Baltic Sea, creating vast dead zones—areas with critically low oxygen levels, resulting in marine ecosystem collapse. These dead zones are located near planned offshore wind farms, presenting an opportunity to establish large-scale LTA solutions within the project at minimal cost. Algal blooms, which often restrict beach access, have become more frequent and can now be observed from space. The Baltic Sea currently hosts seven of the world's ten largest marine dead zones. In 2018, a massive toxic algae bloom forced the closure of many beaches along Poland's coast.

In this context, the ULTAN project aims to harness the potential of offshore energy infrastructure for seaweed and mussel farming by developing a Low-Trophic Aquaculture Roadmap. This roadmap will facilitate the seamless integration of LTA installations within newly established offshore wind farms, optimizing cost efficiency while enhancing marine ecosystem services through seawater purification. A participatory approach will engage key stakeholders, fostering a shared



understanding of the benefits and strategic importance of Multi-Use Low-Trophic Aquaculture (MU-LTA) within Exclusive Economic Zones (EEZs).

Methodology

The overall methodology of this project is built upon a comprehensive, participatory, and data-driven approach. The methodology is designed to integrate LTA within OWF through a carefully orchestrated narrative that blends stakeholder engagement, rigorous scientific assessment, and systematic policy analysis.

From the beginning, the project will engage a broad range of stakeholders including government bodies, industry leaders, marine researchers, offshore wind farm operators, local fishing communities, and environmental NGOs. The participatory process is based on the organization of a series of stakeholder roundtables, where facilitated discussions will uncover both opportunities and challenges associated with LTA deployment. In addition to these meetings, public consultations in the form of open forums and targeted community meetings will provide a platform for local voices, ensuring that the project not only has scientific and technical validity but also enjoys broad social acceptability. Furthermore, co-creation workshops will bring together experts and local practitioners to collaboratively design practical implementation strategies. This inclusive and collaborative approach is intended to create a robust governance model that effectively balances environmental conservation, economic viability, and regulatory compliance.

In terms of scientific assessment, the project will deploy a range of marine sensors to conduct environmental monitoring, collecting real-time data on water quality parameters such as nutrient levels, temperature, and salinity, as well as data on the ecological impacts of seaweed and mussel cultivation. These data will be used to develop baseline studies that document the initial state of selected OWF sites. This baseline information is essential for measuring the impacts of LTA integration over time. Furthermore, the approach includes extensive data-driven modelling using both spatial analysis and economic forecasting tools. These models will predict long-term benefits and potential risks associated with LTA deployment, enabling policymakers and investors to make informed decisions.

The project will also incorporate small-scale pilot implementations that are critical for testing the technical, economic, and environmental feasibility of integrating LTA with OWFs. These pilots will involve the cultivation of selected seaweed and mussel species in controlled offshore conditions. They will serve multiple purposes: evaluating growth and productivity under various environmental conditions, conducting detailed cost-benefit analyses to determine economic viability, and assessing the operational synergies between LTA and OWF infrastructure. By systematically testing these variables, the pilots will generate concrete evidence that supports the scalability and practical implementation of LTA systems.

The methodology incorporates a comprehensive legislative review that examines current national and international policies related to aquaculture, offshore energy, and marine conservation. This review will be complemented by regular regulatory



stakeholder dialogues, where policymakers and regulatory bodies will be engaged to ensure that our roadmap is fully compliant with both existing and emerging legal frameworks. In instances where regulatory gaps are identified, the project will propose policy recommendations designed to harmonize LTA practices with offshore wind operations, thereby mitigating legal risks and smoothing the path for future implementations.

Expected Impacts

The development of the LTA Roadmap is expected to generate impacts well beyond the duration of the project. By establishing a structured, participatory framework for integrating LTA into OWFs, the project will drive concrete changes in marine spatial planning, sustainable aquaculture, and renewable energy practices, with measurable benefits for several key target groups.

From a scientific perspective, the project will deliver new insights into the complex interactions between aquaculture systems and offshore wind infrastructure. The deployment of state-of-the-art sensors to monitor eutrophication levels will generate high-resolution data on nutrient cycling, water quality, and ecosystem services offered by seaweed and mussel farming. This data will not only enhance scientific understanding but also support evidence-based policymaking.

Economically and technologically, the project is designed to stimulate the commercialization of LTA by establishing a robust supply chain model for seaweed and mussel cultivation in Poland's Exclusive Economic Zone (EEZ). By embedding LTA within the existing OWF infrastructure, the initiative aims to reduce operational costs for offshore energy developers while promoting multi-use efficiency. This will pave the way for the development of new products and services in the sustainable aquaculture market. Additionally, the project will facilitate the creation of industry-wide standards and best practices by developing new regulatory frameworks, thus setting the stage for large-scale, replicable deployment of LTA systems in other regions facing similar challenges.

The project will also bring societal benefits by diversifying the local economy, opening up new income streams for the fishing community and other local stakeholders. For instance, small-scale fishers, coastal tourism operators, and local seafood businesses will have the opportunity to participate in the production and distribution of sustainably sourced seaweed and mussel products. The environmental advantages—such as carbon sequestration, water purification, and habitat restoration—will contribute to reduced CO₂ emissions and improved overall environmental quality. These benefits will help enhance public health and well-being, while also raising consumer awareness about sustainable marine practices. Educational and outreach initiatives, tailored to diverse audiences including local communities, environmental NGOs, and policy influencers, will ensure that the project's results lead to improved public policies and decision-making processes.

Capacity

The Municipality of Ustka has a well-established history of engaging in collaborative projects, particularly in areas such as environmental protection, maritime safety, and sustainable development. A notable example is Ustka's involvement in the "B-Prepared" project, an international consortium aimed at enhancing citizen preparedness for disasters and crises through serious gaming, gamified e-learning, and knowledge sharing. Additionally, Ustka has actively participated in the South Coast Baltic initiative, a joint marketing effort promoting the boating region along the southeastern shores of the Baltic Sea. Furthermore, Ustka's collaboration with organizations like PROJMORS, a leading consultancy in marine and land construction, highlights its access to critical infrastructure and expertise necessary for executing complex projects. These examples illustrate Ustka's capability to bring together the necessary actors and resources to achieve the project goals effectively.

Project timeline and implementation phases

Start and end dates: June 2025 (M1) – June 2026 (M12)

Phase and key activities	Delivery date
Phase 1: Stocktaking & Ex ante & Baselines Deliverable 1: Ex-ante analysis report Deliverable 2: Set of sensors installed	M3
Phase 2: Stakeholder Dialogue/s and Road mapping co-designed Deliverable 1: Roadmap Codesigned and Developed	M6
Phase 3: Promotion & Mainstreaming Deliverable 1: 4 storytelling micromovies on LTA and its potential Deliverable 2: 6-episodes podcast on LTA/ its potential in the Southern Baltics	M12

Full AR Proposals and evaluation sheets are available to reviewers and relevant European Commission Personnel upon written request to Deltares at ULTFARMS@deltares.nl

4.3.3 FLOWM Project – AR5

The FLOWM project is carried out in Morocco, bringing a West Atlantic ocean region as an Associated Region within the ULTFARMS Project.

Morocco's Atlantic coast, particularly near Essaouira, boasts significant offshore wind energy potential, and a pilot project is planned off the coast of Essaouira. This initiative underscores the region's strategic importance in Morocco's renewable energy landscape. Integrating low trophic aquaculture farms within offshore wind developments in the Essaouira region of Morocco presents a promising avenue for sustainable marine resource use.

FLOWM aims to leverage the ULTFARMS consortium's experience to carry out feasibility studies, dissemination knowledge about Offshore Wind Farms (OWF) and Low Trophic Aquaculture (LTA) and stakeholders' engagement in order to successfully achieve the following activities:

- A comprehensive capacity development of the FLOWM Team members in the fields of OWF and LTA, through trainings and participation to wide discussions with ULTFARMS main partners, taking benefits from the skills and knowledge present in the consortium. Then, the knowledge acquired will be shared with a wider audience in Morocco.
- Promotion of the integration of LTA with OWF in Essaouira located on the Moroccan Atlantic coast, aiming to reduce environmental impact.
- Demonstration of the relevancy of LTA species cultivation in the oceanic conditions of Morocco, considering factors such as temperature, salinity, water transparency, and hydrodynamics.
- Demonstration of the benefits of LTA species cultivation for the restoration of marine ecosystems at the vicinity of future OWF in Morocco (Project under feasibility study for Essaouira). This experience could be scaled-up and replicated.
- An effective diffusion and awareness of knowledge about OWF and LTA, within the Moroccan relevant stakeholders, using the strengths and expertise within ULTFARMS.

Methodology

The methodology for the FLOWM project is organized in 5 work packages. An inception report will be prepared at the beginning of the project to establish the details of the collaboration between the AR partners on one hand and the co-design and co-development of activities with ULTFARMS partners, on the other hand, to implement the LTA Technique and the integration of the Offshore Wind Energy. It is necessary to refer to previous studies to choose the appropriate algae and/or molluscs that will be implemented. Several studies show the ability to develop algae production in the Moroccan coasts. The appropriate species will be confirmed during the feasibility study.



The methodology also incorporates a desktop study, using relevant site data, to identify suitable locations for LTA within OWFs. This includes measuring ocean currents, wave energy, wave intensity, water quality parameters relevant for filter-feeding organisms and macroalgae growth, as well as bathymetric and seafloor mapping. For this case study in Essaouira region, as the available in situ data are very scarce, remote sensing technologies, including satellite-based sensors and numerical models, will be used and essential for monitoring ocean currents, wave energy, and wind intensity in the Essaouira region. The project will also conduct an environmental impact assessment, involving stakeholders, to identify potential environmental and social impacts and mitigation measures.

Expected Impacts

By demonstrating the feasibility of integrating both wind energy and low-trophic aquaculture, the FLOWM project is expected to deliver significant environmental, economic, and social benefits. From an environmental perspective, the introduction of LTA farms, including the cultivation of filter-feeding bivalves (e.g., mussels and oysters) and seaweed, can provide substantial ecosystem services. These species contribute to water quality improvement by absorbing excess nutrients such as nitrogen and phosphorus, reducing the risk of harmful algal blooms and eutrophication. Additionally, seaweed cultivation facilitates carbon sequestration and mitigates ocean acidification, enhancing marine ecosystem stability. Moreover, LTA farms can create artificial habitats for various marine species, supporting biodiversity in offshore environments.

Economically, this multi-use approach promotes diversification for Essaouira's coastal communities, creating new jobs and market opportunities in aquaculture and renewable energy sectors, while reducing operational costs by optimizing marine spatial use and co-locating infrastructure.

Additionally, the project will contribute to Morocco's climate resilience and renewable energy goals. Low-trophic aquaculture plays a key role in climate adaptation strategies by promoting sustainable food production with minimal environmental footprint. LTA species naturally extract nutrients and carbon from their environment, reducing ecological pressure while contributing to climate mitigation. Integrating aquaculture with offshore wind aligns with Morocco's national energy and sustainability goals. The country has committed to expanding renewable energy capacity to meet climate targets under the Paris Agreement, and offshore wind farms in Essaouira could serve as a model for multi-use ocean space development.

Capacity

The FLOWM project is a consortium with three complementary entities. Firstly, ESTE-UCA, a public university with the laboratory of Interdisciplinary Research in Environment, Management, Energy and Tourism including 3 research groups with skills in marine sciences and environmental assessment impact, Management and



Renewable energies. Secondly DPME, a public consulting of Maritime Fisheries of Essaouira, from the Ministry of Agriculture and Maritime Fisheries sector in Morocco. Thirdly IRESEN a public Research Institute of the Solar Energy and New Energies.

The partnership between ESTE-UCA, DPME, and IRESEN brings together different strengths needed for sustainable aquaculture and renewable energy projects. ESTE-UCA's research in marine sciences and environmental assessment helps DPME applying new technologies. ESTE-UCA's research in Management and Renewable energies helps IRESEN to enhance the project's ability to understand the site and its impact. This collaboration combines research, study feasibility and environmental knowledge to plan and carry out successful projects that benefit marine sciences and technologies.

Project timeline and implementation phases

Start and end dates: June 2025 (M1) – June 2026 (M12)

Phase and key activities	Delivery date
Phase 1 : Capacity Development, Co-design of the activities Deliverable 1.1: Inception report Deliverable 2.1: Site Study and Data Collection Report Deliverable 2.2 : Literature Review Report Deliverable 4.1: Capacity Development and Knowledge Transfer Interim Report	M2 M5 M6 M6
Phase 2 : Technical and economic feasibility Deliverable 2.3: Technical Feasibility Studies Report Deliverable 3.1: Cost-Benefit Analysis Report Deliverable 5.1: Stakeholder Engagement Plan	M8 M9 M10
Phase 3 : Outcomes and Impacts of the project Deliverable 3.2: Environmental and Social Impact Assessment Report Deliverable 4.2: Capacity Development and Knowledge Transfer final Report Deliverable 5.2: Stakeholder Engagement and communication final report	M12 M12 M12

Full AR Proposals and evaluation sheets are available to reviewers and relevant European Commission Personnel upon written request to Deltares at ULTFARMS@deltares.nl



5. AR Working Group

The Associated Regions Working Group (AR-WG) has been established as the regular administrative and support structure for the five on-boarded Associated Regions (ARs). Acting as both a coordination mechanism and a technical support body, the AR-WG provides a structured forum through which ARs can receive tailored technical assistance and advisory services to design roadmaps, action plans, and projects aimed at advancing low-impact marine aquaculture.

The Working Group's scope extends across multiple dimensions of support. It facilitates the identification and prioritisation of topics of relevance to the ARs, ensuring that discussions and outputs are directly connected to their technical and governance needs. It integrates findings from WP9, WP3, and WP4—particularly concerning barriers to multi-use adaptation, innovation uptake, and environmental governance—into practical recommendations for AR-level implementation. In this way, the AR-WG ensures that critical bottlenecks are addressed early and that opportunities for innovation transfer and regional adaptation are maximised.

Governance and core functions

The AR-WG is led by the Coordinator and WP1 lead (Deltares), in collaboration with representatives from DTU (WP8 lead), FuE and RBINS, which are also members of the ULTFARMS Central Coordination Team (CCT). This structure ensures that AR support is fully aligned with the project-wide objectives.

A core responsibility of the AR-WG is the creation of selection criteria, which underpin the transparent admission and support of ARs. The group also develops publication materials, operational objectives and action plans to support its activities. In addition, the AR-WG assumes responsibility for the quality assurance (QA) of all related activities, deliverables, and milestones. It documents the entire AR selection process, including applications from the open call, final selected candidates, activity plans, and all relevant permissions, ensuring full compliance with data protection principles.

Communication and monitoring

As previously described in Section 4.1, the AR-WG has established monitoring mechanisms that allow for continuous feedback between the ARs and ULTFARMS partners. This will help track progress, identify potential challenges, and offer timely interventions to ensure that the ARs' activities remain aligned with the project's overall objectives. These include regular monthly meetings with each AR to receive updates on the current status of development, showcasing interim results, or having project partners be readily available for requested support. The results of these meetings and the minutes thereof will be logged and available as annexes to the updated versions



of this deliverable. Deliverables and milestones also serve as a reporting mechanism to track progress.

Besides regular meetings, communication within the AR-WG is maintained through email updates and on the ULTFARMS Teams channel, which also serves as a shared platform for data and information sharing.

Integration strategy

The AR-WG will play a pivotal role in ensuring that the activities of the five Associate Regions (ARs) are closely aligned with the broader objectives of the ULTFARMS project. To achieve this, the Working Group will focus on three key areas of integration: ULTFARMS-wide communication and dissemination efforts, co-design and co-development workshops, and the effective coupling of the ARs' individual plans with the expertise of the ULTFARMS project partners.

Alignment with ULTFARMS-Wide Communication and Dissemination Events is required in order to maximise the effectiveness of these activities and to ensure there is no duplication or lost effort in executing these tasks. The AR Working Group will ensure that the Associate Regions actively participate in ULTFARMS' communication and dissemination strategies, both at the project level and within their local and regional contexts. This will include integrating AR activities into ULTFARMS' overarching communication plan to maximize visibility and impact. The ARs will be required to contribute to a range of dissemination activities, including:

- 1) **Project-wide events:** The ARs will be featured in conferences, webinars, and public engagement events that highlight their progress and innovations. Their participation will showcase how ULTFARMS solutions are being adapted in different geographical regions.
- 2) **Digital platforms:** The ARs will contribute content to the ULTFARMS website, social media channels, and newsletters, ensuring that their achievements and ongoing developments are shared with a wider audience, including policymakers, industry stakeholders, and the general public.
- 3) **Publications and reports:** AR project outcomes will be included in technical reports, case studies, and academic papers produced by ULTFARMS, offering detailed insights into the local implementation of project solutions.

By aligning their communication efforts with the larger ULTFARMS narrative, the ARs will help to build a cohesive story of success across multiple regions, demonstrating the replicability and scalability of project outcomes. The AR Working Group will additionally organize a series of co-design and co-development workshops to foster collaboration between the Associate Regions and the ULTFARMS consortium. These workshops will serve as platforms for knowledge exchange, innovation, and joint problem-solving, a first of which has already been held in regard to seaweed



aquaculture seeding and harvesting. The Working Group will ensure that the ARs' activities are tailored to complement these collaborative efforts by focusing on:

- 1) **Specific AR support:** Each AR will present its unique local challenges and opportunities during the workshops, enabling ULTFARMS partners to offer tailored solutions that are grounded in the project's core methodologies.
- 2) **Technology transfer:** The workshops will emphasize the transfer of cutting-edge technologies and approaches developed within ULTFARMS to the ARs. Topics such as LTA system integration, renewable energy applications, and multi-use marine space management will be central to these sessions.
- 3) **Problem-solving and innovation:** By engaging in these co-development workshops, the ARs will work closely with technical experts to co-design strategies for deploying ULTFARMS solutions in their respective regions. This will help to fine-tune activities and ensure that the innovations are locally applicable and feasible.

These workshops will be structured to ensure that the ARs' goals are not only aligned with ULTFARMS but also enriched through the hands-on input and feedback from the consortium partners. The AR Working Group will coordinate the coupling of the Associate Regions' individual project plans with the specific expertise of ULTFARMS project partners, ensuring a seamless integration of knowledge and support. By matching the needs and challenges identified in the AR proposals with the specialized expertise of ULTFARMS partners, such as Deltares, FuE, RBINS, DTU, and others. This collaboration will provide ARs with direct access to experts in aquaculture, renewable energy, ecological monitoring, and marine governance, helping to accelerate the successful implementation of their plans and fill the knowledge gaps that are present. Furthermore, the pairings will ensure that the final designs and deployments remain relevant for integration into a cohesive final roadmap, are transferable between sites, and remain scalable for future commercialisation efforts and upscaled deployment. Each AR will have access to personalized consultations with relevant consortium members, ensuring that technical support is provided on critical issues such as regulatory compliance, technological deployment, and environmental monitoring. Furthermore, ULTFARMS partners will share their knowledge resources—such as best practices, technical guidelines, and lessons learned from pilot projects—with the ARs; this extends to species and material selections for designs, aid in optimising deployment and operational procedures, and is to the benefit of the project as a whole as it allows for increase comparability between the pilot and AR results at the conclusion of the work. This will allow the ARs to build upon existing insights, avoiding duplication of efforts and ensuring smoother execution of their activities.

In sum, the AR Working Group will serve as a central coordinating body to ensure that the Associate Regions' activities are fully integrated into the wider ULTFARMS framework. By aligning communication strategies, fostering co-design workshops,



and leveraging the expertise of consortium partners, the ARs will be well-positioned to contribute meaningfully to the project's goals and accelerate the uptake of innovative LTA solutions in their respective regions.

6. Annex - AR Expected Activities and Evaluation Criteria

The details of the expected activities for the Associated Regions and the Evaluation Metrics and Plan are included here for review and are a brief form of those included in D 1.1 – AR Call Text.

Expected Activities of Associate Regions:

The two selected Associate Regions were required to conform to specific criteria in their proposals, ensuring alignment with ULTFARMS objectives. Both regions will join the ULTFARMS AR-Working Group, a project design group under Work Package 8, led by Deltares and DTU. This group is responsible for integrating and supporting the Associate Regions within the project and serves as the main facilitator for their activities and collaboration with ULTFARMS and its Pilot partners.

In their proposals, the selected areas needed to outline how they would participate in the project, specifically detailing how their involvement would connect with local or regional activities. They were also encouraged to highlight any ongoing or planned efforts related to offshore low-trophic aquaculture, especially in combination with other activities like renewable energy.

The selected regions are expected to actively participate in ULTFARMS communications, trainings, and stakeholder engagements, including project meetings, workshops, discussions, and conferences. Additionally, they are required to engage with the Blue Mission BANOS project, a Coordination and Support Action (CSA), to share insights on their local blue economy activities. All these efforts will be coordinated with the support of the AR-Working Group.

In addition to their participation in communication and training activities, the selected Associate Regions (ARs) will, to varying degrees, co-develop offshore multi-use Low Trophic Aquaculture (LTA) systems, depending on the plans submitted in their proposals. This includes analysing development outcomes to assess how solutions from the ULTFARMS project can be adapted and implemented to meet the specific needs of each AR. The level of involvement in these activities will vary based on the individual goals and missions of each AR, ensuring that the solutions developed are flexible, generalized, and suitable for local adaptation. This approach promotes the uptake of LTA solutions and strengthens the ARs' capacities by building networks, fostering collaboration, and establishing clear communication channels between the ARs and complementary enterprises, authorities, and stakeholders.

Moreover, AR-led local or regional authorities will engage in governance activities and work to identify legal barriers, permit requirements, access rights, insurance needs, and other prerequisites for the development, deployment, operation, and decommissioning of LTA systems in their regions. By pinpointing regional challenges, ARs will help facilitate the transfer of solutions developed in ULTFARMS pilot cases, offering guidance on overcoming these roadblocks. Additionally, technological, operational, and policy solutions from ULTFARMS will be adapted and implemented



in collaboration with local entities, such as SMEs, knowledge institutions, universities, and regulatory agencies, ensuring that ARs can smoothly adopt LTA solutions, especially in multi-use settings with existing or planned wind farm operations.

Evaluation:

Independent Evaluation: Three experts from the ULTFARMS Associate Region Working Group assessed the proposals based on the award criteria: Impact (8 points), Excellence (6 points) and Implementation (6 points) and recorded their individual opinion on each proposal using the evaluation form. An average was taken among experts' scores, with a minimum threshold of 14 points required to be eligible for funding through the call;

- (1) Evaluation Committee Consensus: Based on the ranking results of the independent project partners responsible for evaluations, at the end of month 2 of the call being open, a ranked list of eligible candidates will be generated
- (2) Less developed Regions will receive particular attention to ensure inclusion of such regions as candidates within the call to ensure replicability in a full spectrum of ARs, as requested by the European Commission
- (3) From the end of month 2 of the call's publications, once evaluated, the top ARs eligible will be notified and contracts generated.
- (4) This will be done on a rolling basis until the minimum threshold of 5 ARs has been achieved or other instructions have been received by ULTFARMS from the granting authority, European Commission, or Project Administrator.

AR Selection Committee

The selection process for the AR candidates was conducted by three self-nominated organizations, including the Coordinator, which are members of the CCT. This process was discussed by the CCT, and the final members were voted on by the Committee. These members, agreed upon during a meeting on April 14, 2023, included representatives from Deltares, DTU, FuE, and RBINS, in accordance with the procedure outlined in the Grant Agreement. The group continually reviewed candidates on a rolling basis while the call remained open to ensure timely evaluations and avoid lengthy evaluation periods after the call's closure, the forms used for the evaluation can be found in the annex post ceding this section. In June, 2024, the selection committee convened in order to discuss the review of the proposals and come to a final decision on which of the Associate Regions would be included in the project, and move forward to a Grant Development phase with the ULTFARMS project, and which did not meet sufficient criteria and would not proceed to AR status.



The evaluation was based on specific criteria and a scoring system to maintain consistency and ensure a fair and transparent process. The top five AR applicants who met the minimum threshold of 14 points were informed of their successful application and have been developing contract agreements with the ULTFARMS Coordinator, Deltares, in order to formalise the activities and being their contribution and participation in the project as a formal AR. From the notification point, the successful applicants had 30 days to respond and initiate the contracting procedure and formalize agreements to join the ULTFARMS project as ARs.



AR Evaluation Form





7. Annex - Evaluation Form

Reviewer / Organization				
Applicant Name				
Applicant Organization				
Country				
Section	Description	Comments	Score (1-5)	
Implementation (6)	Relevance and Capacity to Execute Role	Relevance of the organization(s) and its/their capacity to carry out defined actions		(0-2)
	Relevance and Novelty of Actions	Relevance of planned work in context of both call and project objectives and aims, also the degree of proposed activities alignment with actions and activities being carried out within the project and project knowledge capacities		(0-2)
	Consistency in Work Plan & time-line	Consistency and viability of the planned timeline and coherence with project timeline and alignment with the project activities		(0-2)
Impact (8)	Replicability	To what degree do the proposed actions aid in enhancing the replicability of LTA or restoration within OWFs, in general and for project specific solutions		(0-3)
	Scalability	Of the proposed actions, how do they address aiding the scalability of LTA and restoration within OWFs		(0-2)
	Commercialization	How well does the proposed work hasten the adoption of LTA solutions in a commercial manner, as related to the described activities and capacity of the applicant to activate grants, funding, licensing, policy or promote the commercial adoption of LTA in their national, regional, or local communities		(0-3)
Excellence (6)	Methodology	How feasible is the outline methodology given the proposed body of work to be executed. How rigorous and robust are the methods outlined		(0-2)
	Objectives	How Succinct and relevant are the objectives outlined in the proposed work. To what degree do these relate to the objectives outlined in the call		(0-2)
	Approach	How coherent and viable is the approach proposed in the body of work and to what degree can the approach be supported by project capacity and knowledge		(0-2)

XX /
Total 20

