



# AAC Recommendation on Research and Innovation priorities for the aquaculture sector

AAC 2025-11

October 2025



The Aquaculture Advisory Council (AAC) gratefully acknowledges EU funding support





## **Index**

Index .....	2
Background.....	3
Justification.....	4
Recommendations.....	13

## **I. Background**

The AAC has considered a number of stakeholders and sources in relation to the European research and innovation landscape. This has included reports, publications, policy initiatives and existing research calls and programmes drawn from amongst others:

1. Specific European Commission (EC) Directorates-General (DG) and other organisations including:
  - EC DG Research and Innovation (RTD)
  - EC DG for Maritime Affairs and Fisheries (MARE)
  - EC DG for Environment (ENV)
  - EC DG for Agriculture and Rural Development
  - EC DG for Regional and Urban Policy (REGIO) – in relation to the Thematic Smart Specialisation Strategy for the Blue Economy and other aspects on inter-regional collaboration across Europe
  - The Standing Committee on Agricultural Research (Fish)
  - The EU Reference Centre for the Welfare of Aquatic Animals (EURCAW-Aqua)
  - The European Court of Auditors (ECA)
  - Agencies including: the European Climate, Infrastructure and Environment Executive Agency (CINEA), the European Food Safety Authority (EFSA), the European Research Executive Agency (REA) etc.
2. Member States (MS) representatives and organisations, in relation to the need to prioritise aquaculture within relevant co-funded (MS / EC) partnerships and within national research strategies and priorities.
3. European funded research programmes, specifically the 9<sup>th</sup> EU Framework Programme (Horizon Europe, including EU Mission “Restore our Ocean and Waters”) with a forward look to the Work Programme 2026/27 and the development process for any 10<sup>th</sup> Framework Programme (FP10).
4. The European Partnerships and European Platforms most relevant to aquaculture, specifically but not exclusively:
  - The European Partnership for Animal Health and Welfare (EUPAHW)
  - The Sustainable Blue Economy Partnership (SBEP)
  - The European Partnership for Sustainable Food Systems (SFSP)
  - The Energy Transition Partnership for EU Fisheries and Aquaculture
  - The EU<sub>4</sub>Algae Platform
  - The European Maritime Spatial Planning (EU MSP) Platform
  - The EU Sea Basin Strategies
5. European Technology Platforms and Research Networks:
  - The European Aquaculture Technology and Innovation Platform (EATIP), the Farm Animal Breeding and Reproductive European Technology Platform (FABRE TP), Food For Life, the European Technology Platform for Research & Innovation into Organics and Agroecology (TP Organics)
  - The Joint Research Centre (JRC), the European Innovation Council (EIC)
  - The European Fisheries and Aquaculture Research Organisation (EFARO), the International Council for the Exploration of the Sea (ICES)
6. Professional associations and organisations
7. NGOs and civil society organisations (in addition to those already involved in the above stated

multi-actor platforms).

This paper on research priorities and recommendations has been considered in the context of other economic and social factors including using reports generally recognised at an EU institution level – e.g. the European Market Observatory for Fisheries and Aquaculture Products (EUMOFA), the Scientific, Technical and Economic Committee for Fisheries (STECF) or reports of the Food and Agriculture Organization of the United Nations.

Finally, members of the AAC have recalled the principle that research ought to be conducted with ultimate goal of delivering benefit and impact to the European citizens and taxpayers who fund it.

### **Cross Referenced European Research Priorities - Documents**

The principal input to the current recommendation has been provided by AAC members. However, the recommendations have been informed by key documents already published relating to research and innovation actions including:

- Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030 (COM/2021/236). (Hereafter “The Strategic Guidelines for EU Aquaculture”)
- A new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future (COM/2021/240).
- Towards a Strong and Sustainable EU Algae Sector (SWD(2022) 361).
- Food 2030 2.0 Pathways for Action.
- European Framework Programme Orientation Documents and Work Programmes.
- European Partnership Work Programmes.
- Farm to Fork Strategy.
- SCAR-Fish Prioritisation Actions / Foresight Exercises.
- EATIP Strategic Research & Innovation Agenda
- Linked multi-actor organisations publishing agreed objective Strategic Research & Innovation Agendas such as other European Technology Platforms (ETPS), EFARO, ICES, Joint Programming Initiatives (JPIs).

## **II. Justification**

Both European aquaculture producers and policy makers have expressed concern at the lack of growth within European aquaculture, particularly when compared to elsewhere in the world. Recent reports (ECA) suggest that support for the sector, including research funding, has not delivered the results hoped for in terms of increased and improved production and has not sufficiently addressed key bottlenecks and challenges.

The Common Fisheries Policy Regulation has called for a coordinated EU strategic approach to support the growth of the EU aquaculture sector while ensuring its economic, environmental and social sustainability. The Strategic Guidelines for European Aquaculture place an emphasis on sustainable growth and addresses a number of priority areas, all of which will benefit from greater research and innovation transfer effort. Priority areas include: access to space and water, regulation and administration, animal health and public health, climate change adaptation and mitigation, producer and market organisation, diversification and adding value, environmental performance, animal welfare, data and monitoring and control and aspects of social licence. There is a strong feeling on the part of stakeholders that research actions and results are not being effectively implemented and knowledge outputs are not being transferred. This is particularly challenging in the aquaculture sector given the diverse number of species and production systems and the high level (80%) of micro

businesses and other SME enterprises.

Aquaculture is predicted to have an increasingly important role in EU & MS food policy and food systems. The AAC highlights that aquatic foods are the only part of the food production system that do not receive direct subsidy for production or subsidy for set-aside. Rather than subsidy, the sector therefore calls for aquaculture to be supported through prioritisation for further research and innovation actions thereby allowing the sector to continue to develop in an innovative and self-sustaining manner.

There is a mismatch between the stated aims of the EC regarding food policy (with regard to moving towards a strategic food autonomy across all sectors) and aquaculture topics selected for support within the current Horizon Europe Work Programmes. Specifically, there is an emphasis placed on low trophic aquaculture production, and diversification of species, whilst European consumers demonstrate a continuing demand and preference for the major finfish species (including Atlantic salmon, rainbow trout, sea bass, sea bream, carp) produced in existing systems (pond/lagoon, raceway, recirculating aquaculture systems (RAS), cage systems) alongside the key shellfish production species (blue mussels, oysters, clams) and corresponding production systems.

Consideration must also be given to the important role aquaculture can play in the wider food system in terms of providing ingredients for animal feeds, for nutraceutical use, and for use as a fertiliser and can be a key driver of the blue bioeconomy especially in freshwater environment.

With multiple channels for European research activities to be funded and undertaken, it is important to avoid duplication and repetition of research activities, to ensure synergies between projects and work programmes and for research results to be effectively communicated to stakeholders to ensure impact.

However, given the extreme diversity of aquaculture systems, in some cases more focused research objectives are required, as the current allocation of projects does not give sufficient support to certain production sectors, which are therefore placed at a competitive disadvantage in terms of benefiting from publicly funded research calls.

Some important topics for research are not being addressed due to a failure to take on board stakeholder concerns. Issues such as social licence for the aquaculture sector and innovation within the market, alongside the socio-economics and profitability of the production sector are frequently overlooked.

Finally, the timing for such recommendations is pertinent, given the commitment to research and innovation within cross cutting objective four of the Strategic Guidelines for European Aquaculture (see above) and the expression on the part of various Directorates General of the European Commission for input on Horizon Europe programmes and the work of the European Partnerships.

### **1) Identifying challenges and suggesting solutions for aquaculture research**

A series of meetings and round table exercises invited AAC members to provide their thoughts and input on identifying common challenges and barriers alongside suggesting solutions in order to advance aquaculture research and innovation transfer. The following points have been noted:

#### **Principles:**

- (i) There is a need for a suitable balance between fundamental and applied research. This may include support to local centres for applied research, which are better equipped to study and



offer short-term answers on production challenges and urgent problems. Priorities should address sustainable aquaculture production and include economic, social, environmental and aquatic animal health and welfare topics.

- (ii) There is a need to address the “greenwashing” behaviour in research.
- (iii) Much more attention should be paid on the blue / green interface – i.e. the interaction between aquaculture and terrestrial resource use.
- (iv) Research and innovation effort should continue to support aquaculture species which we already produce (in addition to calls for alternative and novel species) and where there continue to be ongoing production challenges. The concept of European funding being designated towards higher level research should recognise those sectors that continue to require support for core aspects of production, including technological bottlenecks.

Emphasis should be placed on the diversification and / or improvement of production methods more than the diversification of species. Very significant amounts of funding have been dedicated to species diversification with very limited results (although it is noted there are many reasons for that – not least there being a good availability of capture species with farmed production costs proving higher than catch prices).

#### **Drivers**

- (v) Lack of growth
- (vi) The need to address more urgently climate change and anthropic impacts as some aquaculture products could completely disappear within only a few years. Meanwhile there will be important impacts on fish health and welfare
- (vii) The need for an increased digitalisation across the entire aquaculture value chain, including application to production, processing, distribution and with regard to traceability of aquatic food products.
- (viii) As data management and availability is a key factor for efficiency and competitiveness in both public and private sector a reflection in depth on the possible adoption of common and standardized approaches is necessary. How do we finance data registration and management? How can it be profitable when delegated to private companies and where should it remain as an open strategic resource? How to ensure continuity and development of existing frameworks and the necessary steps to move to “big data systems”? How to ensure inter-operability of systems? Enterprises and decision makers need to access freely and easily to both historical and real-time climatic data on national or EU scale.

#### **Call Design, Work Programmes and specific needs for the Aquaculture Sector**

- (ix) Synergies between aquaculture and other Horizon clusters and destinations should be emphasised with the presumption being for aquaculture to be included even where not explicitly stated. Although a complex challenge within the structuring of the research landscape, exacerbated by the wish not to lose control over the allocation of any funding to competing interests, the role of aquaculture within terrestrial food production and other cross sectoral topics (digital technologies, satellite mapping, AI, water and soil health etc.) must not be excluded.
- (x) Noting the micro and SME structure of the majority (80%) of European aquaculture production businesses, companies and producers are not able to deal with the complexities and economic realities of research outputs and innovation transfer. Economic realities must be addressed. Call topics should address this, with call designs specifically requiring innovation transfer to be included alongside communication, dissemination and exploitation

actions.

- (xi) Aquaculture stakeholders (usually companies, organisations, Producer Organisations) are often approached, at very late stages in proposal development to be included as SME partners, on advisory boards or as trial sites. Approaches are often token and bring little value. Consideration should be given within call design as to how to meaningfully include primary producers, industry organisations or other stakeholders so as to bring mutual added value. Many producers and indeed producer organisations lack resources to be able to fully engage in projects (time, complying with reporting requirements etc.) and as such are unable to engage in the process. Valuable contributions are therefore lost and a more equitable form of engagement in calls should be considered.
- (xii) There is a lack of effort regarding synthesis of research outputs, as a result of which research results are being lost and / or duplicated. The Aquaculture Assistance Mechanism (AAM) provides an opportunity for a wholesale improvement in the presentation and communication of aquatic research results:
- (xiii) The knowledge base of the AAM should be presented and promoted to all stakeholders as a database for all research outputs, with functionality and operability designed to be easy and targeted towards primary producers and interested stakeholders.
- (xiv) All EU funded projects should be required to produce standard factsheets on background, methods, outputs, impacts and conclusions alongside background and methodology, and for such factsheets to be easily downloadable, in relevant languages, from the AAM knowledge base
- (xv) Promote further research at a sea-basin, catchment or regional level, including collaboration on best practices transfer between equivalent production systems.
- (xvi) The European Commission should stipulate that national research effort and national research strategies / priorities for aquaculture be referenced within Member State multi annual national strategic plans (MNSP) for aquaculture.
- (xvii) Stated national priorities should be reflected in the allocation and prioritisation of funding for aquaculture at both the EU level and at the Member State level when utilising EU funding mechanism, for example, the European Maritime, Fisheries and Aquaculture Fund (EMFAF).

### **Research Prioritisation**

- (xviii) With the encouragement of the European Commission, in 2008 the aquaculture sector commenced the process of consulting on and establishing the European Aquaculture Technology and Innovation Platform (EATiP). This membership funded multi-actor platform continues to function and to promote a sectoral Strategic Research and Innovation Agenda (SRIA) and assist in communication, dissemination and exploitation activities. There should be greater engagement with the EATiP over research and innovation requirements for the sector and for assisting with knowledge and innovation transfer, for example, as demonstrated by the inclusion of European Technology Platforms within the Horizon 2020 Framework Programme. This is pertinent in relation to current emphasis placed on the need to improve industry innovation transfer and European competitiveness within the new Commission policy cycle.
- (xix) Mapping of aquaculture producer and stakeholder needs should be supported and undertaken to more accurately inform documents such as call topics and priority areas (e.g. for Framework Programmes, European Partnership SRIAs), the EATiP SRIA and to assess needs in terms of regional innovation transfer and future priority areas for the AAM.
- (xx) Promote regional-thematic reference centres to centralise knowledge and make it available.

This may be aligned under the AAM.

### **Specific technical challenges of the sector**

The AAC members considering research and innovation have further identified specific technical challenges for the sector.

Given the breadth and scope of the European aquaculture sector, reflected in the composition of the AAC, it is not envisaged to enter into recommendations for specific call topics or detailed project proposals. Broader thematic areas have been identified and are reported below. Where possible, these have been identified as cross sectoral challenges, rather than listing specific issues for shellfish, finfish and algae culture.

Since these are challenges relating to different topics, it has been decided to avoid any ranking.

### **Health, Quality and Welfare of aquaculture produced species**

Ensuring the health, welfare and survival of aquaculture produced species is paramount. We advocate for the development and implementation of solutions and management procedures that improve aquatic animal health and welfare and reduce loss during farming. It is essential to respect the biological needs of aquaculture organisms throughout their lifecycle. The pattern of diseases, pathogens, disease transmission are changing dramatically. Our understanding of new diseases, of autoimmune response and of the role of genetics and breeding / selection is evolving.

These changes must be addressed in a holistic approach:

- Addressing the challenges related to microbial and viral management in aquaculture systems.
- Enhancing biosecurity measures to prevent disease outbreaks and ensure a healthy farming environment.
- Enhancing genetic traits that ensures high quality and robust offspring. Other consideration on genetic and breeding potentialities are reported below in “Technologies” section.
- Including epidemiological studies on environment and emerging disease (noting that funding is very difficult to secure for these broader studies, and that this area might well prove beyond the scope of the European partnership of scientists and funders helping to improve animal health and welfare (EUPAHW).
- On fry and fingerling quality, addressing ‘immune competence’ and maintaining optimal qualities/performance of farmed animals. Taking a holistic approach, covering different disciplines such as (epi)genetics, digestive physiology (new dietary ingredients), role of microbiome (in digestion but also in immune response), etc. and to be made equally valid / applicable for all species produced in Europe: marine and freshwater fish, crustaceans and molluscs.
- On temperature management, using appropriate temperatures at different production stages to ensure optimal development of gills, kidneys, skin, and heart, enabling fish to thrive in intensive farming conditions.

*Welfare - Promote and support research:*

- On tailored farming practices that address the needs of individual fish.
- On best practices and methodologies to assess welfare status on live fish on site without compromising life.
- On the requirements for further development of welfare parameters during slaughtering, to test equipment and to develop indicators for welfare assessment at slaughter.
- On technologies and solutions to minimize stress during handling and crowding processes.



### **Environmental footprint assessment, Biodiversity conservation and Circularity**

The aquaculture industry must prioritize environmental protection. It includes reducing impact, better use of side streams, promoting circular production systems, promoting energy transition and exploring models for Integrated multi-trophic aquaculture (IMTA) and aquaponics.

Ensuring a suitable environment for aquaculture production to be performed stay the first condition for aquaculture to grow and develop, while shared parameters and methodologies for environmental impact assessment are the key tools for decision making on environment management and governance.

Ensuring a suitable environment for aquaculture - Promote and support research:

- On strategies to better understand and manage the blue / green interface – i.e. the interaction between aquaculture and terrestrial resource use.
- On strategies to mitigate risks and promote a responsible industry. There are specific issues relating to shellfish in terms of water quality which should be addressed.
- On alien species impact and management.

*Environmental impact assessment - Promote and support research:*

- Assessing ecosystem services of aquaculture (reduced eutrophication, reduced nitrogen levels, carbon sink/sequestration, etc.).
- Assessing shared and standard parameters and protocol for the evaluation of environmental performances and sustainability, including Life Cycle Assessment (LCA) & Product Environmental Footprint (PEF).
  - On comparative LCA-PEF analysis in the context of the wider bioeconomy in relation to the environmental balance of aquaculture.
  - To develop and harmonise biodiversity measuring and monitoring tools (environmental DNA, etc).
  - To develop and harmonise carbon footprint measuring and monitoring tools.

*Environmental impact management - Promote and support research:*

- Considering the potential positive effect that nutrients from aquaculture in the sea may have on nutrient-poor marine areas.
- Considering that sustainability may equally be linked to increasing some productions – i.e. promoting low-trophic aquaculture or pond aquaculture.
- On alternative solutions for plastic materials used in aquaculture.
- On energy transition in Fisheries and Aquaculture.
- On low-impact, low-trophic and multi trophic aquaculture (IMTA) with particular regard to quantified and recognized ecosystem services.
- On minimizing environmental impact through better management of escapes and effluents.
- On recover and use of by-products from processing plants, from RAS/closed systems (sludge, effluents), etc.
- On shellfish natural stock restoration.

### **Socio-economics**

*Research and innovation extend to a number of areas beyond primary production. Although it is important to harmonise with work being undertaken with linked organisations (e.g. Market Advisory Council) nonetheless there is a require to consider economic performances, capacity building, security and post farm gate value chain issues.*

*Capacity building and security - Promote and support research:*

- Facilitating comprehensive training initiatives to equip workers with the skills needed for

modern aquaculture practices.

- Facilitating recruitment of the next generation of aquaculture workers, involving young people at an early stage and providing them with room for growth.
- Implementing measures to ensure the safety and well-being of industry workers.
- On specialized training for Recirculating Aquaculture Systems (RAS).
- Promoting “corporate social responsibility”.

*Economic performances - Promote and support research:*

- Addressing socio-economic research gaps. For example, providing market analysis or addressing issues relating to social licence, consumer affairs and innovation across the value chain.
- Addressing profitability of the production systems including cost analysis of production methodology linked to environmental indexing should be undertaken across the aquaculture sector, cross referenced to other protein sectors across the food systems.
- Developing and harmonizing sets of socio-economic indicators as required by the EC and all stakeholders, including tools for the evaluation of socio-economic performances of EU/MS aquaculture growth.

*Post farm-gate value and logistic - Promote and support research:*

- On new marketing strategies.
- On innovation in traditional product presentation techniques.
- On new and differentiated quality products (e.g. through quality brands, protected designation of origin (PDO), protected geographical indication (PGI), etc.)
- On post farm-gate logistics (including last mile logistics) and new forms of distribution – including low carbon transport options, utilisation of freezing technologies etc.)
- On circularity in packaging.

### **Technologies enhancement as driver for the EU aquaculture growth**

*It includes new production systems, new species, new feed ingredients, last generation feeds, genetic-breeding selection, digitalization and “Precision farming”.*

*Diversification and improvement of aquaculture farming systems and species - Promote and support research:*

- Addressing storage technologies.
- On development of new species suitable for large-scale farming. Suitability should include an understanding of physiological and welfare needs, as an evaluation of socio-economics constraints.
- On viable methods for promoting commercial applications of IMTA, Freshwater Integrated Multitrophic Aquaculture (FIMTA), Aquaponics and offshore systems.
- To improve flow-through and Recirculating Aquaculture Systems (RAS) in land-based systems consolidating existing facilities and reducing environmental impact.
- To improve offshore and subsea sea-based farming systems consolidating existing facilities and reducing environmental impact.
- To improve shellfish long-term depuration and stockage.

*Fish feed and feed ingredients - Promote and support research:*

- Developing more effective fish feed and administration solutions.
- Promoting the use of sustainable ingredients produced within Europe, including novel alternatives.
- To assess the potential use of new aquaculture low trophic species as ingredients in fish feed

to support overall production.

*Genetics and breeding technologies - Promote and support research:*

- Addressing survival and health, novel sequencing and genotyping information and more precise animal (and aquatic plant) breeding programmes that originate from the recent genomic data revolution, new production systems and climate change, multi-trait genetic resistance, identification of the genetic mechanisms and novel traits that underly production stability, nutrient and resource efficiency, disease resistance, and animal health and welfare in the face of challenges of climate change and across multiple production environments (sea, freshwater, on-land, recirculation aquaculture system, and their combinations).
- On shellfish seed selection.

*Leveraging digital technologies, robotics for precision farming - Promote and support research:*

- Adopting robotic technologies for inspection, intervention and maintenance tasks in offshore cages.
- Ensuring traceability and objective documentation of farmed products to uphold industry reputation.
- Implementing sensors for comprehensive documentation of production processes and environmental parameters, including new rapid technologies for product and process control during farming and post farm-gate processes.
- On accurate monitoring and management of fish biomass within cages, including technologies for optimal fish distribution.
- On the use of satellite data and in situ data for monitoring, forecasting and prevention.
- On the harmonization of used data, of registration and management protocols, of used hardware/software support for better decision-making.

## 2) Summary and Prioritisation of Areas for Research

As stated, it is not the intention of the AAC to present a detailed list of proposed research call topics, not least as many of these issues are actively being considered by industry with the support of the research community. However, the group has summarised thematic research topics with relevant issues requiring further consideration, alongside what sort of research is required. The group considers the different thematic areas to be of equal importance. It is the intention of the AAC to update this table on an annual basis, alongside giving an opinion on short-term, mid-term and longer-term priorities if helpful to research providers and funders.

Table 1: Identification of thematic research topics and corresponding issues. Please note for columns 3 – 6, (1) denotes “basic research” is required, (2) applied research and (3) refers to strategies & governance

Thematic Area	Issues	Sector	1	2	3
Health & Quality	Improve microbial and viral management including the use of vaccination strategies	All	X		
	Enhance genetic traits	All	X	X	
	Enhance fry and fingerling quality	Fish	X	X	
	Enhance shellfish seed quality	Shellfish	X	X	
	Promote epidemiologic studies	All	X		X
Welfare	Address the needs of individual fish	Fish	X	X	
	Assess welfare status on live fish	Fish	X	X	

	Develop welfare parameters to be used during slaughtering	Fish	X	X	
	Minimize stress during handling and crowding processes	All	X	X	
Suitable environment for aquaculture	Develop strategies to better understand and manage the blue / green interface.	All			X
	Develop strategies to mitigate risks and promote a responsible industry.	All			X
	Promote studies on alien species impact and management	All	X		X
Assessment & management of environmental impact of aquaculture	Assess shared & harmonized parameters & protocols for environmental performances evaluation (LCA, PEF, carbon footprint, nitrogen sinking, etc.)	All	X		X
	Better manage escapes and effluents	Fish	X	X	X
	Carry on research on comparative LCA-PEF analysis in the context of the wider bioeconomy	All	X		X
	Carry on research on low-impact, low-trophic and multi trophic aquaculture with regard to quantified & recognized ecosystem services	Low impact species & Farming	X	X	X
	Consider the potential positive effect nutrients on nutrient-poor marine areas	Fish			X
	Develop and harmonise biodiversity measuring & monitoring tools (E-DNA, etc).	All	X		X
	Develop technologies to recover and use of by-products	All	X	X	X
	Energy transition in aquaculture	All	X	X	X
	Promote research of alternative solutions for plastic materials used in aquaculture	All	X	X	
	Promote study strategies for shellfish natural stock restoration	Shellfish	X	X	X
Capacity building and security	Enhance workers skills for modern aquaculture practices	All			X
	Facilitate recruitment of the next generation	All			X
	Promote specialized training for Recirculating Aquaculture Systems	Fish			X
	Promote "corporate social responsibility"	Fish			X
Socio-economic performances	Address socio-economic research gaps	All	X	X	X
	Address profitability of the production systems	All	X	X	X
	Develop and harmonize sets of socio-economic indicators	All	X	X	X
Post farm-gate value chain	Promote studies on new marketing strategies, packaging innovations and circularity, product diversification and logistic creating new market outlets & reducing environmental impact	All		X	X

Diversification & improvement of farming systems	Improve all aquaculture systems consolidating existing facilities and reducing environmental impact (flow-through, RAS, offshore and subsea.	All	X	X	
	Improve shellfish long-term depuration & stockage.	Shellfish	X	X	
	Promote research on new species suitable for large-scale farming.	All	X	X	
	Promote research on viable methods for commercial applications of IMTA & FIMTA	All	X	X	
Fish feed and feed ingredients	Develop more effective fish feed and administration solutions	Fed species	X	X	
	Promote the use of sustainable ingredients produced in Europe, including novel alternatives.	Fed species	X	X	
	Utilizing new aquaculture low trophic species as ingredients in fish feed	Fed species	X	X	
Genetics and breeding technologies	Take advantage of genetics and breeding new technologies to boost resistance & quality	All	X		
	Farmed fish fry selection	Fish	X	X	
	Farmed shellfish seed selection	Shellfish	X	X	
Digitalization, sensors & robotics for precision farming	Address the potentialities of the use of satellite data and in situ data for monitoring, forecasting and prevention.	All	X	X	X
	Develop traceability tools for farmed products	All		X	X
	Harmonize used data, data registration & management protocols, used hardware/software	All		X	X
	Sensors for environmental parameters	All	X	X	
	Sensors for rapid product and process control in both production & post farm-gate processes.	All	X	X	
	Studies to introduce in cage farming: - robotic technologies; - monitoring & management systems of fish biomass - technologies for optimal fish distribution.	Fish cages			

### III. Recommendations

As demonstrated by this paper, research and innovation issues for the aquaculture sector is a broad topic covering numerous thematic areas.

- Research and innovation actions for aquaculture falls under the competency and scope of a number of different EC directorates, alongside many other linked organisations, such as European Partnerships, executive agencies and European Missions.
- Noting the task contained within the Annex of the Strategic Guidelines for European Aquaculture that the AAC should "coordinate and support research and innovation in line with identified priorities, including those priorities reflected in the reports of the SCAR-Fish".
- Noting the discussions surrounding the development of the new Framework Programme and EU Competitiveness Fund, the further development of the European Partnership Programme



and the European Missions

- Acknowledging the views expressed in high level policy documents such as the Draghi Report on EU competitiveness and the EC report entitled “Align, Act, Accelerate”, questioning European competitiveness, specifically with regard to research and innovation transfer to industry
- Considering concerns at the lack of sustainable growth within the European aquaculture sector and with regard to lack of return on investment

### **Recommendations to the European Commission**

The AAC recommends:

- That the European Commission note the research and innovation priorities listed above, including aspects of knowledge transfer and industry engagement, and ensure due consideration is given to these areas in the development of future calls under the appropriate research programme, including Framework Programmes (Horizon Europe and FP10), European Partnerships and European Mission work programmes.
- That under the next Multi Annual Financial Framework, Europe maintains a strong, independent, adequately resourced Framework Programme (FP10), with sufficient resources allocated to support the research and innovation priorities identified above for a resilient, sustainable European Aquaculture sector.
- That an annual meeting should be convened by DG MARE to discuss research and innovation issues relevant for European aquaculture, including consideration of current priorities, recent research outputs and matters related to knowledge and innovation transfer, and comprising the relevant representatives with responsibility for the aquaculture sector drawn from the DGs: MARE, RTD, Health and Food Safety (SANTE), REGIO, Internal Market, Industry, Entrepreneurship and SMEs (GROW), ENV alongside representatives from CINEA and REA, the European Partnerships, the SCAR-Fish Committee and such other organisations and individuals as recommended by the AAC.
- That the European Commission works with and supports existing Technology Platforms and research & innovation networks to communicate and disseminate project results more effectively, specifically to producers and value chain actors in a more targeted manner, and to seek input on strategic research and innovation needs.
- That further support and financial assistance is given to the implementation of innovation transfer through Smart Specialisation Strategies (S3) for the aquaculture sector, including at a regional level.
- That continued resources are directed towards the Aquaculture Assistance Mechanism (AAM), promoting the potential and function of the AAM knowledge base with specific consideration given as to how aquaculture producers and other stakeholders may be assisted in accessing and using research outputs and knowledge provided through the AAM (e.g. through provision of fact sheets, easy to access indexes of results, translation of key findings into relevant EU MS languages etc).
- That Multi-Annual National Strategic Plans for aquaculture development should contain a specific section outlining a strategy for research and innovation actions alongside innovation and knowledge transfer, to support sustainable aquaculture development at the national level.

## **Recommendations to the EU Member States**

The AAC recommends:

- That Member States provide to the European Commission and the AAC an annual summary of research and innovation activities relevant to aquaculture being undertaken or prioritised within their national research strategies.
- That Member States provide a summary of research and innovation dissemination and communication activities, including innovation transfer actions, undertaken at the national level relevant to aquaculture.
- That Multi-Annual National Strategic Plans for aquaculture development should contain a specific section outlining a strategy for research and innovation actions alongside innovation and knowledge transfer, to support sustainable aquaculture development at the national level.
- That Member States should provide to the AAC information on those National Contact Points and Scientific Experts who advise on MS research priorities relevant to aquaculture.
- That Member States should provide an estimation on national research effort on aquaculture (including financial contribution) to assist in better understanding the European research and innovation landscape for European aquaculture.



**Aquaculture Advisory Council (AAC)**

Rue Montoyer 31, 1000 Brussels, Belgium

Tel: +32 (0) 2 720 00 73

E-mail: [secretariat@aac-europe.org](mailto:secretariat@aac-europe.org)

LinkedIn: <https://www.linkedin.com/company/aquaculture-advisory-council/>  
[www.aac-europe.org](http://www.aac-europe.org)