



EATIP FORUM - “FRESHWATER AQUACULTURE – NATURE BASED SOLUTIONS”

On May 26th March 2021, about 100 participants attended the virtual [European Aquaculture Technology and Innovation Platform](#) (EATIP) Forum, co-hosted by the EATiP Mirror Platform (MiP) Cluster HUNATIP. The presentations can be viewed at the EATiP Forum web site [FRESHWATER AQUACULTURE: NATURE-BASED SOLUTIONS](#).

The Forum consisted of two opening talks and four thematic presentations addressing trends, innovation opportunities and challenges in traditional freshwater aquaculture in Europe.

As is revealed by a recent EUMOFA study ([Freshwater aquaculture in the EU.pdf](#)), the importance of the freshwater aquaculture sector is underestimated in Europe. **Safa Souidi**, AND-International, presented the current situation and potentialities for growth, as published in the report. Freshwater production currently represents only 3% of the EU supply of aquatic products, with trout and carp as main species, and is either declining or stagnating. The statistics are based on the European Data Collection Framework (under regulation (EU) 2017/1004). However, as the reporting of inland freshwater data is not mandatory, accurate monitoring from a socio-economic perspective is lacking and the total production is significantly underestimated. Most MS have not yet reached the production targets set in their national plans, but it is expected that freshwater production will expand due to innovative solutions such as intensification, introduction of new high-value species, disease prevention and promotion of pond farming. Boosting the product demand is another important factor. This can be achieved through market segmentation and customised semi-prepared products that are more valued throughout the year. Incentive regulations, better energy efficiency and use of recirculation systems were also identified as key factors to increase production.

A revision of the [Strategic guidelines](#) for more sustainable and competitive EU aquaculture (2021-2030) has just been completed in order to respond to the European Green Deal and Farm to Fork strategy. Four priorities were identified, upon which the EU Member States (MS) will develop their own national strategic plans, and forming the basis for support through the European Maritime Fisheries and Aquaculture Fund (EMFAF).

The second introductory speaker, **Reinhold Hanel** representing EIFAAC and director of the Thünen Institute in Germany, confirmed that freshwater aquaculture is an underutilised resource in Europe. During the FAO regional consultations in Europe on guidelines for sustainable aquaculture, technical innovation was identified as being key to a further development of freshwater aquaculture. Compared to mariculture, little to no attention has been paid to spatial planning of inland aquaculture. Harmonised legislation and good governance practices, finding a good balance between environmental protection and aquaculture production, are needed to create a level-playing field in an international context. EU national strategic plans were mentioned as a good template to promote better procedures for the expansion of inland aquaculture, providing administrative challenges and access rights to land and resources are resolved.

The following speakers presented different innovations in freshwater aquaculture across Europe. **Jesper Heldbo** from the EATiP Mirror Platform AquaCircle, presented the Danish aquaculture case, from raceway systems through to advanced RAS technologies using as little as 50-400 l water per kg of produced fish. Different components have been identified as key to successful RAS, such as aeration and degassing devices, faecal traps, and fixed or moving bed biofilters. In developing countries, the concept of water recirculation has been implemented into traditional fish farms to reduce their footprint. Results were shown from a technology transfer



programme in Vietnam, for Pangasius and shrimp farms. In both cases, considerable improvements have been achieved through adapting the systems developed in Denmark, in combination with training programmes.

A second example on better exploitation of freshwater resources was presented by **Tamas Bardocz** from the AquBioTech Group. When introducing RAS into the production cycle, the system needs to be tailored to the species' and operator's requirements. In traditional aquaculture, improvements can be achieved both through vertical integration, hereby reducing the overall production period, and through horizontal integration where different species are combined into a zero-discharge system. Further efforts are needed to reduce the costs of installing and operating RAS. Improvements in water treatment, efficient feeding, and decision support systems and improve the stability of RAS were mentioned as some of the key issues.

Bela Halasi-Kovacs, director at the Research Centre for Fisheries and Aquaculture (HAKI - Hungary), highlighted two potential areas for development of freshwater aquaculture in Europe. The first being the delivery of ecosystem services. Pond farms create and maintain about 400 000 ha of constructed wetland areas in the EU. These are man-made constructions, having similar nutrient cycles as natural habitats, but with higher nutrient levels and a dominance of planktonic organisms. As a result, the food web evolves into a richer one, whereas the intensity of production is limited by the natural system. Examples of freshwater aquaculture induced ecosystem services are regulation of the environmental balance, production of fish, reed and other crops, and cultural and educational services. Combining intensive and extensive systems, such as raceways or cages in ponds and RAS-pond systems, and different species in one system, also provide unique opportunities for an enhanced production that is competitive, sustainable and circular. Some examples of combined extensive-intensive systems in Europe were shown.

The case of the development of an innovative freshwater multi-trophic system (OASIS) trialled on Irish peatlands was presented by **Damien Toner** from Ireland's Seafood Development Agency, BIM. Peatlands are typical nutrient-poor areas where little can be grown. The farm model presented has a minimal abstraction and discharge, utilises renewable energy from surrounding wind turbines and produces both duckweed and algae in addition to fish. It is performed according to organic principles. Four pill ponds with fish are connected to water treatment areas containing bacteria, duckweed and algae, hereby contributing to the circular economy targets. Duckweed is of particular commercial interest as it is a potential alternative protein source for salmon feed, it can take up ammonia directly, and grows very fast. Apart from algal concentration peaks in spring, the system shows a high stability and has the ambition to become world's most sustainable fish farm.

An **on-line survey** was run among the participants. It showed that about 60% of the respondents believed in a moderate (5-10%), and 25% in a high (>10%) growth potential of the freshwater aquaculture sector in the EU. The strongest importance was given to new technologies, product innovation, marketing and regulatory framework as factors to further develop the sector. Multi-trophic systems and RAS were chosen as having the far highest potential to diversify traditional pond systems in Europe. When asked to consider the role of RAS in freshwater production, three application areas were ranked almost equally high: in full-cycle fish production close to the market, in hatcheries and nurseries to stock traditional units, and for the production of high value niche products. The reduction of new water use and the further enhancement of the environmental sustainability of fish production were chosen as issues of high importance for the application of RAS in freshwater aquaculture.

As a **conclusion**, the different interventions encouraged a further development of the freshwater aquaculture branch in Europe for reasons of food self-sufficiency, as contributor to the economic diversification and resilience in rural areas and for the provision of ecosystem services. Its transition to a more competitive sector will depend on technical innovation, a sound regulation regime, capacity building, and a strong interaction between research, policy and industry stakeholders. There is also a clear need for knowledge transfer and best practice exchange.



The Forum exposed freshwater aquaculture as having unexploited opportunities in food production, ecosystem services and rural development in many regions in Europe. The event contributed to communicating the importance of freshwater aquaculture. This sector is currently underestimated, both in quantity of production, as contributor to rural development and as mitigation tool in human-altered environments. It was agreed that joint efforts are needed on both national and European levels to support a utilisation of its full capacity.

The **set of recommendations** resulting from the EATiP Forum on Freshwater aquaculture are:

- There is a need for further R&I support, in particular when it comes to technical production aspects, marketing strategies and quantification of the environmental and social benefits of fishpond aquaculture.
- (Partial) recirculating aquaculture systems (RAS) and aquaponics represent a large innovation potential, but so does intensification of traditional pond systems, digitalisation and automation, and the efficient use of energy and water. Optimisation of these solutions needs to relate to the species farmed and to the local conditions.
- Efforts are needed to achieve a stronger visibility of freshwater aquaculture as a contributor to the (circular) economy and as an ecosystem service. This can be obtained through better organisation of producers, improved reporting routines and statistical systems, a stronger integration with agriculture and support by national governments.
- As good market prices are needed to enable any technology investments, innovation in the delivery of new and attractive products that appeal to the consumer is key. Use of the term “aquatic food” instead of “seafood” was suggested – particularly when taking a food systems approach – to emphasise that not all aquatic foods are from a marine origin.
- EMFAF needs to be used for non-bureaucratic / regulatory support measures, so that it can increase its role in the provision of support to enable the required investments in the technologies needed for a sustainable intensification of inland aquaculture.

For further information on this webinar, as well as any other queries, please contact EATiP at secretariat@eatip.eu.