

Promoting Sustainable Development of Local Fishery Products Through Responsible Bio-Innovation and Technological Advancement

Thursday, 12 March 2026 15:10 (10 minutes)

In recent years, the modern fishing and aquaculture sectors have focused on sustainable technological innovation to improve the quality, safety and shelf life of fish products. These innovative systems include using alternative ingredients in feed, such as insect or algae proteins, to improve production efficiency and product quality. Furthermore, several studies have demonstrated that innovative processing technologies, could contribute both to preserve the sensory qualities of fish products, significantly extending their shelf life and to increase competitiveness of European productions.

However, bio-innovation and technological advancement do not automatically translate into long-term territorial benefits or sustainable socio-ecological transitions. Their ultimate impact depends on how these technical solutions are integrated within complex local production systems, evolving regulatory frameworks, and diverse collaborative networks. Similarly, technological innovations in fish production must interact dynamically with local infrastructure, specialised technical skills, institutional regulations and stakeholder relationships in order to evolve into “integrated innovations”.

To promote sustainable and responsible development of local fishery industries and products, we propose a transdisciplinary analytical model that connects technological upgrading with three interrelated enabling conditions: first, the strengthening of local strategic competencies, including advanced technical expertise, modern processing facilities, and enhanced regulatory awareness. The second is the fostering of stable, multi-helix collaboration among producers, researchers, public actors, and civil society through structured spaces for co-working and co-design, such as living labs. The third is the facilitation of cross-sectoral coordination to align decentralized innovation efforts with shared sustainability and regional development goals. In conclusion, the adoption of this transdisciplinary analytical framework to advance technological innovation in the fisheries sector, by strengthening local strategic capabilities, fostering multi-helix collaboration, and facilitating cross-sectoral coordination, could act as a powerful catalyst for enhancing market performance and promoting more resilient, territorially based bio-innovation pathways.

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Session Classification: Sustainable Bioeconomy & Nature Based Solutions

Track Classification: General sessions: Bioconvergence & Resilient Innovation Ecosystems