

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

Aiello Alessandra¹, Nguyen Thuong¹, Arena Rosaria¹

¹University of Palermo, Piazza Marina, 61, 90133 Palermo PA, Italy

In recent years, the fishing and aquaculture sectors have concentrated on technological innovation to enhance the quality, safety, and shelf-life of seafood products. However, technical advancements do not automatically ensure long-term territorial benefits or sustainable socio-ecological transitions. **Their ultimate impact depends on :**



Technological innovations

Focuses on sustainable solutions like alternative proteins (insects/algae) and advanced processing to enhance seafood quality, safety, and shelf-life while improving production efficiency.

Regulatory frameworks

Operates as a dynamic pillar ensuring that technical solutions align with evolving institutional standards and local production systems to become truly "integrated innovations."

Diverse collaborative networks

Connects producers, researchers, and public actors through multi-helix cooperation and shared spaces like living labs to foster long-term, sustainable territorial transitions.

A transdisciplinary analytical model is applied to promote sustainable and responsible development of local fishery industries and products: technological upgrading is connected with three interrelated enabling conditions



Strengthening local strategic competencies

- Enhanced regulatory awareness
 - Advanced technical expertise
- Modern processing facilities



Fostering of stable multi-helix collaboration

- Private sectors: businesses/ startups
 - Academic researchers
- Public actors across levels
 - Civil society/ Community
 - Structured spaces for co-working and co-design



Facilitating cross-sectoral coordination

- Decentralized innovation efforts
 - Shared sustainability
 - Regional development goals

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.