MedAID - Mediterranean Aquaculture Integrated Development

Duration: From 01/05/2017 to 30/04/2021 (expanded to 30 November 2021)

Project Summary

Production and productivity of Mediterranean marine fish aquaculture, mainly seabass and seabream, are stagnating or growing slowly as a result of multiple and interrelated causes. To accomplish the objective of improving its competitiveness and sustainability, MedAID was structured in a first interdisciplinary WP to assess technical, environmental, market, socioeconomic and governance weaknesses, and in several specialized WPs exploring innovative solutions, followed by an integrating WP, which provided codes of practice and innovative tool-boxes throughout the value chain to enhance the sector performance holistically. Various stakeholders interacted in the consultation, communication, dissemination and training WPs ensuring practical orientation of the project and results implementation. Biological performance (nutrition, health and genetics) was scrutinized to identify and quantify the relevant components to improve Key Performance Indicators (KPIs: growth rates, mortality and feed efficiency), thus contributing to increase production efficiency. Economic, business, marketing, environmental, social, administrative and legal factors were addressed to obtain integrated solutions to shift towards a market-oriented and consumer-responsible business and to face the multiple administrative, environmental and social issues constraining competitiveness and public acceptance. An interdisciplinary consortium of research and industrial partners carried out R&D and case study activities to close the existing gaps. Mediterranean countries (EU and non-EU) with significant aquaculture production were represented. Northern European R&D institutions participated by bringing successful technological tools and integrated approaches that Mediterranean aquaculture was missing. MedAID impacted the sector positively by providing innovative tools, integrated marketing and business plans and by improving the sector image, sustainability and governance.

Objectives

MedAID was a research project developed by a consortium of 34 partners from European and non-European countries. Its main objective was to improve sustainability efficiency and competitiveness for the industry by providing strategies for optimizing production processes, marketing, business, administration and sector image and governance, by combining socioeconomics, biological sciences and food technology. The project provided integrated solutions targeted to solve specific industrial bottlenecks of a technical nature throughout the whole value chain.

Activities

The MedAID assessment of Mediterranean aquaculture sustainability covered technical, economic, environmental, social and governance components, and identified main KPIs (Key Performance Indicators) and enterprise typologies. Further integrative analysis led to develop the MedAID farm benchmarking tool. MedAID ran 15 experiments, including a two-site on-farm trial, in 6 countries, focusing on current knowledge gaps in rearing conditions, feeding strategies, management practices, welfare and interlinks with genetics. The applicability and economic profitability of the approaches was also assessed. A 60K SNP genotyping array (MedFish) was designed for seabass and seabream as a collaboration between MedAID and PerformFish projects and industrial partners. 10,000 fish were genotyped to study fat deposition and quality traits and identify potential markers for selection, and to examine the genetic diversity and relatedness of populations of both species, showing differentiation between wild and farmed populations. Genetic x Environment interaction effect was confirmed using the array in two Mediterranean locations. A survey assessed farm biosecurity and pathogens in 8 countries to develop a farm risk scoring system. An analysis on nodavirus introduction and spread identified hazard points, as introducing live fish in farms. MedAID analysed Mediterranean laboratories' diagnostic capacities with two ring tests on nodavirus diagnosis and lab mapping. It organized the Mediterranean fish health forum and published a Manual on diagnostics of seabass and seabream diseases. A prototype vaccine against VNN virus (with innovative VLP bio-technology) was characterized, and lab challenges showed it is safe and effective. A list of welfare indicators for seabream was produced. Consumer segments, their needs and potential for accepting new fish products, were identified in France, Germany and Spain. Adapted fish-product ideas were selected through a screening process with stakeholders, applying co-creation techniques and textual analysis. Eight product prototypes from seabass, seabream and meagre were developed at pilot scale. Four were elaborated in short production runs and validated with consumers. The optimal product and packaging configuration attributes were 1 Ref. Ares (2022)1381563 - 23/02/2022 derived from consumer choice experiments. The products' technical and economic feasibility was evaluated. The economics of production studies investigated the technical efficiency and scale effects of Mediterranean aquaculture companies, indicating that there is still room for improvement, and ranking the impact of selected KPIs on farms economic results. The AquiAID tool was developed with artificial intelligence to support farms' decision-making. The market dynamics and price analysis described market drivers (including mass media coverage), showing price volatility, price sensitivity of demand, and supply being affected by production costs. The retailer/consumer study confirmed 3 preferred attributes: size, level of processing and country of origin. A forecast analysis of the impact of Covid-19 in the sector was done. MedAID developed Guidelines in support of social acceptability (SA) for aquaculture development with Mediterranean stakeholders. A methodological framework to improve SA was proposed and tested in 3 local case studies (in Greece, Spain and Tunisia) showing how SA was addressed, identifying SA factors, and exploring potential responses from companies and acceptable scenarios of aquaculture development. MedAID synthesized its main outputs in a benchmarking software and in 48 recommendations on technical aspects, business plans, better governance and social acceptance. MedAID partners participated in 112 external meetings and published 81 articles, reports and conference abstracts. The project organized stakeholder consultation and dissemination activities (more than 20 local, national and international events), as well as 5 training courses for professionals.

Results and impacts:

Progress beyond the state of the art, expected results until the end of the project and potential impacts (including the socio-economic impact and the wider societal implications of the project so far).

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Role of CIHEAM Zaragoza in the project: co-ordination of the project, and lead of both participatory consultation and dissemination, communication and training WPs.

Coordinator: Mediterranean Agronomic Institute of Zaragoza / International Centre for Advanced Mediterranean Agronomic Studies – Spain.

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Partners:

- Mediterranean Agronomic Institute of Zaragoza / International Centre for Advanced Mediterranean Agronomic Studies, Spain
- INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTARIES, Spain

- NOFIMA AS, Norway
- VETERINAERINSTITUTTET - NORWEGIAN VETERINARY INSTITUTE, Norway
- UNIVERSIDAD DE CANTABRIA, Spain
- INSTITUT FRANCAIS DE RECHERCHE POUR L'EXPLOITATION DE LA MER, France
- FUNDACION AZTI - AZTI FUNDAZIOA, Spain
- HELLENIC CENTRE FOR MARINE RESEARCH, Greece
- HRVATSKI VETERINARSKI INSTITUT, Croatia
- DANMARKS TEKNISKE UNIVERSITET, Denmark
- AARHUS UNIVERSITET, Denmark
- KOBENHAVNS UNIVERSITET, Denmark.
- NATIONAL INSTITUTE OF OCEANOGRAPHY AND FISHERIES, Egypt
- SCEA LES POISSONS DU SOLEIL, France
- SELARL DU DOCTEUR ALAIN LE BRETON, France
- AVDELAS LAMPRAKIS, Greece
- ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELLE VENEZIE, Italy
- ALMA MATER STUDIORUM-UNIVERSITA DI BOLOGNA, Italy
- NISEA SOCIETA COOPERATIVA, Italy
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- CENTRO DE CIENCIAS DO MAR DO ALGARVE, Portugal
- DIBAQ DIPROTEG SA, Spain
- INSTITUTO NACIONAL DE INVESTIGACION Y TECNOLOGIA AGRARIA Y ALIMENTARIA, Spain
- INSTITUT NATIONAL DES SCIENCES ET TECHNOLOGIES DE LA MER, Tunisia
- EGE UNIVERSITY, Turkey
- GALAXIDI MARINE FARM AE, Greece
- STICHTING WAGENINGEN RESEARCH the Netherlands
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- FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS FAO, Italy
- THE UNIVERSITY OF EDINBURGH, UK