BLUE ECONOMY: NEW GENERATION TOOLS FOR AQUACULTURE

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Introduction

Aquaculture is one of the biggest food producing sectors providing over 50% of the world's fish consumption. Global production is forecasted to increase **from 45 million tons in 2014** to **85 million by 2030**, making the aquaculture industry the fastest growing animal food production sector in the world.

However, there are major challenges that have to be addressed:

- maintaining the **economic viability of the sector** by reducing costs and increasing production
- guaranteeing **high quality food** and **animal welfare**
- addressing **environmental concerns**.

All aquaculture producers are concerned on **how to improve the performance** of their companies in terms of cost, feed conversion, growth rate and mortality and **at the same time, be sustainable and environmental friendly**

The work to be presented is a theoretical framework for the development of integrated e-tools for aquaculture production aiming at sustainable solutions in this area. The purpose of these tools is to provide **innovative data services** that will benefit all the stakeholders of the aquaculture sector. The aim is to support

- **Companies** to **maximize** the **growth rate**, **reduce costs** and **minimize** the **impact** on the **environment**
- **Investors** to make **efficient identification of strategic locations of interest** and select **the most profitable investments**
- **Governments** and environmental agencies to evaluate the current situation and define policies
- **Researchers** to generate new knowledge and evaluate the practical indicators of aquafarming performance

Approach

Aquaculture is a complex production, influenced by many interrelated factors that have to do with environment, production management practices, feeding strategies and the daily operation of the farms. Small mistakes can make the difference from profit to loss. Furthermore, aquaculture, in common with many other sectors, uses natural resources and interacts with the environment and as such it is increasingly confronted with issues of environmental protection.

Social impact needs to be accounted for when evaluating the total value and cost of integration of the business in the overall landscape of sustainable development.

All those factors require substantial and diverse data, coming from statistics, sampling and earth observation, as well as theoretical models that simulate the processes engaged, realised as computer software.

BlueBRIDGE is an innovative H2020 project aiming to address these needs. It will deliver services to **serve data practitioners of the Blue Growth sector**.

It brings together **scientists, practitioners and experts** from different disciplines (e.g. fisheries, biology, economics, statistics, environment, etc.), who are individually considered as **world leaders** in their respective areas. The Food and Agriculture Organization of United Nations (FAO) is one of the main partners

Cloud-computing and big-data era principles are deployed in the BlueBRIDGE project via its Blue Economy Pillar, offering the virtual space, i.e. Virtual Research Environment that hosts data and enables the composition and delivery of services for serving aquafarms, policy makers and academic institutes.

Those services allow stakeholders to analyze and comprehend the performance of an aquafarming operation in a friendly, collaboration-promoting space, while preserving the confidentiality of valuable datasets.

Bluebridge will offer analysis and simulation algorithms to the aquaculture community, through the project infrastructure

These services will enable companies to

- **Calculate performance** in terms of main production KPIs
- **Develop accurate feeding and growth models**, based on the realities and the conditions of each company. The result is **accurate feeding, better predictions and plans, identification of populations that are not performing well**
- **Benchmark** their performance by comparing their results to "global" models for selected species and regions

It will also support **Investment Planning.** Bluebridge will provide services and an extendible, open, geospatial analysis and optimization system to support intelligent identification of locations of interest, as required by both investors seeking optimization of intended investments

Finally, the services offered by the platform will support research and policy making. For that purpose, Bluebridge will support

- Collaborative production of **scientific knowledge required for monitoring fisheries and habitat degradation for analysing socio-economic performance in aquaculture**.
- **Scientists** to easily access published data sources and existing models and use them in their activity aiming at developing new models or fine tuning existing ones
- **Governments** to identify areas that are becoming of environmental importance and design policies and plans