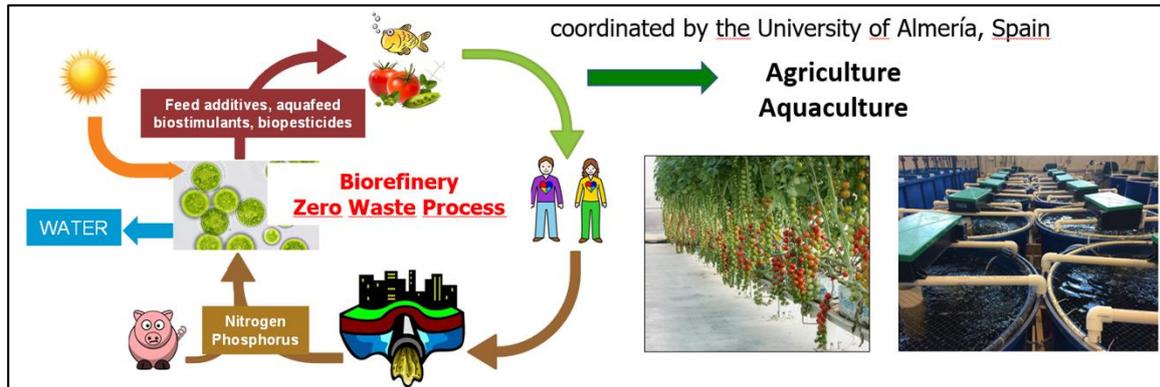


## EU Horizon2020 project Sabana is over (2016-2021)

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Demonstrating the application of microalgae in agriculture and aquaculture



The project SABANA (EU Horizon 2020 Research and Innovation Programme, grant agreement No 727874 Sustainable Algae Biorefinery for Agriculture and Aquaculture, 2016-2021) demonstrated the reliability of large-scale microalgae-based cultivation plants for the production of biostimulants, biopesticides and feed additives (high-value products), in addition to biofertilizers and aquafeed (low-value products) using only nutrients from wastewaters (sewage, centrate and pig manure) or marine water. The project confirmed the development of a zero-waste process at a demonstration-scale which is sustainable both environmentally and economically.

In particular, SABANA addressed (i) the selection of microalgae strains with bio-stimulating and antimicrobial activity, (ii) the use of microalgae-bacteria consortia in co-culture, (iii) the implementation of efficient raceway ponds and thin-layer cascades, (iv) the recovery of nutrients from wastewater (sewage and manure), (v) the development of microalgae harvesting processes and recycling purified water, (vi) the processing of residual biomass to produce biofertilizers and aquafeed in the zero-waste scheme, and (vii) the scale-up of bioreactors and the development of robust and sustainable technology and (viii) the socio-economic benefits, due to food production in agriculture and aquaculture.

The selection and characterization of microalgae strains and the development of monitoring techniques for the evaluation of culture performance in bioreactors were performed by research institutions participating in the project – Szechenyi István University, University of Las Palmas, University of Almería, and the Institute of Microbiology.

In summary, the SABANA project was finalized with the operation of four different microalgae facilities of about 7 ha, demonstrating the reliability of microalgae-based industrial processes. Production technologies were demonstrated in: (i) the R&D facility operated by the University of Almeria (0.5 ha, Almeria, Spain), (ii) the DEMO facility operated by Biorizon Biotech (1.5 ha, Almería, Spain) for the production of microalgae using clean water and fertilizers, and (iii) two INDUSTRIAL wastewater treatment facilities operated by FCC Aqualia (3 ha in Merida; 2 ha in Hellín, Spain) for the combined process of microalgae biomass production and wastewater

treatment. The overall performance of the new facilities was evaluated in the period from 2018 to 2021, especially focused on the biology of the cultivation systems. In the demo facilities the companies GEA Westfalia, KIT, Biorizon, and Aqualia were able to improve the efficiency of cultivation, harvesting, and processing technologies to provide reliable techniques for large-scale valorization of microalgae biomass for target applications.

The field trials both for agriculture and aquaculture-related applications were also completed. The target compounds – biostimulants and biopesticides – were already validated, demonstrating an increase in crop production by agriculture while reducing the consumption of fertilizers. BIORIZON carried out several trials in collaboration with farmers to explore different crops and locations. In aquaculture use, the feed additives based on microalgae allow for improving the “health” of fish, increasing the tolerance to adverse stress conditions. AIA (Agricola Italiana Alimentare) completed trials in collaboration with the aquaculture sector to demonstrate and validate the benefits of microalgae addition in aquafeed, presenting positive probiotic effects.