

BOOK OF ABSTRACTS



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BOOK OF ABSTRACTS



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23331 | Life cycle assessment of floating wetland islands for crop production

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Background & Aim: Floating wetland islands (FWI) are innovative, nature-based solutions for water management and ecological restoration, rooted in circular economy and sustainable development [1,2]. They consist of floating media planted with macrophytes that act as biofilters by absorbing pollutants like nitrogen and phosphorus, thereby enhancing crop production [3]. FWI in hydroponic crops can be a viable alternative for agricultural production, allowing a yield per square meter by taking advantage of the nutrients present in the water and optimizing the use of space. This study aims to evaluate the feasibility of crop production in FWI using a hydroponic system, estimating the potential yield per square meter. Additionally, a life cycle assessment (LCA) will be performed to quantify the environmental impact and ensure resource efficiency in this innovative agricultural approach. **Methods:** Rainwater runoff will be used and characterized to evaluate parameters such as nutrients, organic matter, dissolved oxygen, salinity, pH, electrical conductivity and temperature. The study will consist of a prototype FWI with three replicates and a control, using expanded clay on the floating platform. Plants will be selected for humans and animals. Biomass production per m², foliar analysis and chlorophyll will be measured. Finally, LCA will be carried out from “cradle to grave”, considering the limits and scope of the system in three types of scenarios. **Expected results:** The feasibility of hydroponic crop production in FWI is expected, analyzing yield per square meter, associated to the plants health and establishment. The LCA will allow us to assess the environmental impact and identify opportunities to optimize the sustainability and efficiency of the system according to the planned approach. system according to the intended approach.

Keywords: Agriculture, food production, Rainwater runoff, Life Cycle Analysis, nature-based solutions.

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