Vertical haloponics: sustainable and resilient productions using brackish water

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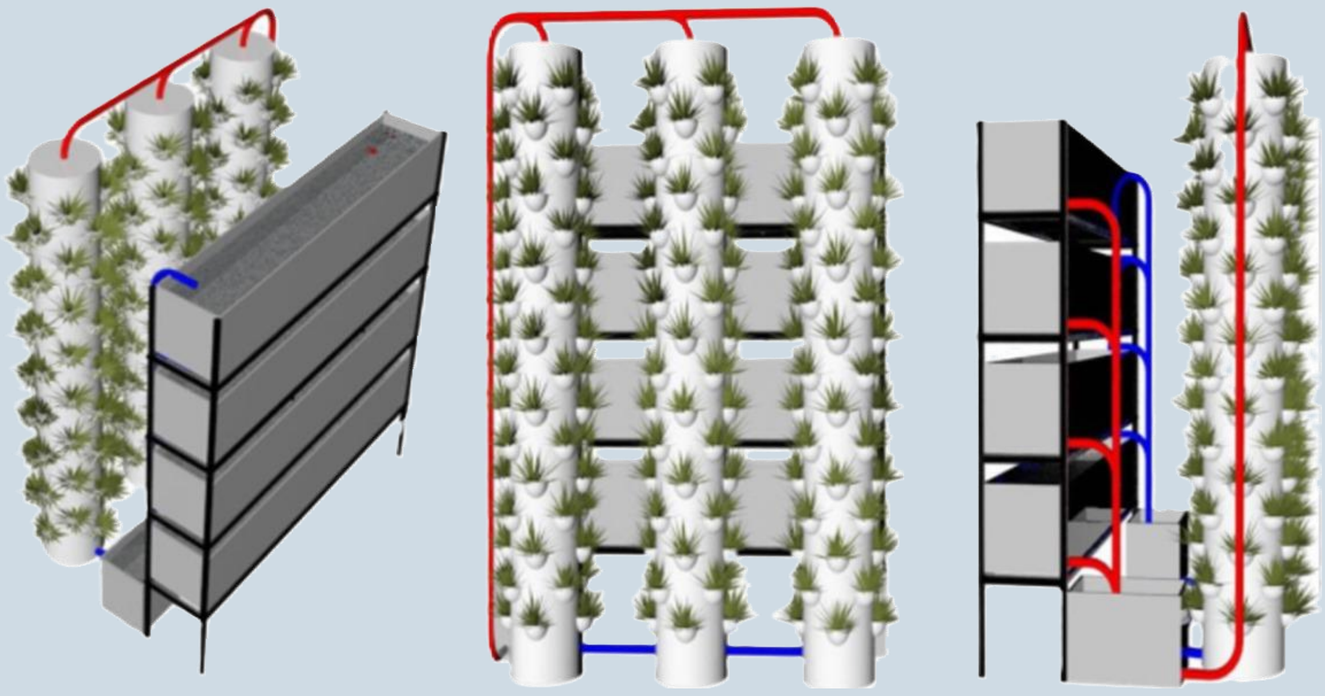
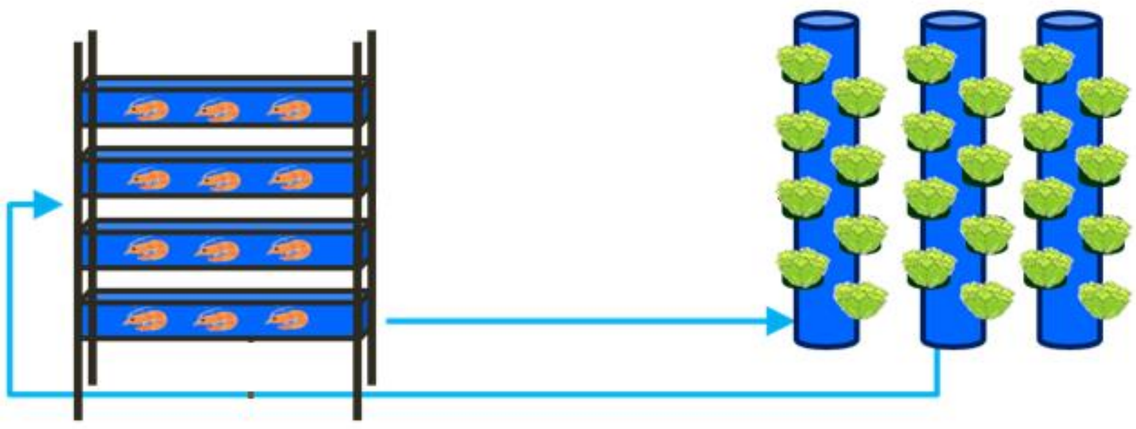
Aquaponics can provide short and eco-friendly food supply chains with increased resource-use efficiency, high environmental sustainability, and food resilience



- The VERTICHALPONICS project is pioneering an innovative food production system.
- We're measuring the environmental and economic sustainability of our system through a cutting-edge blend of LCA and LCC analysis.
- Exploring the agronomic valorization of sludge to uncover its potential in mitigating environmental impacts.

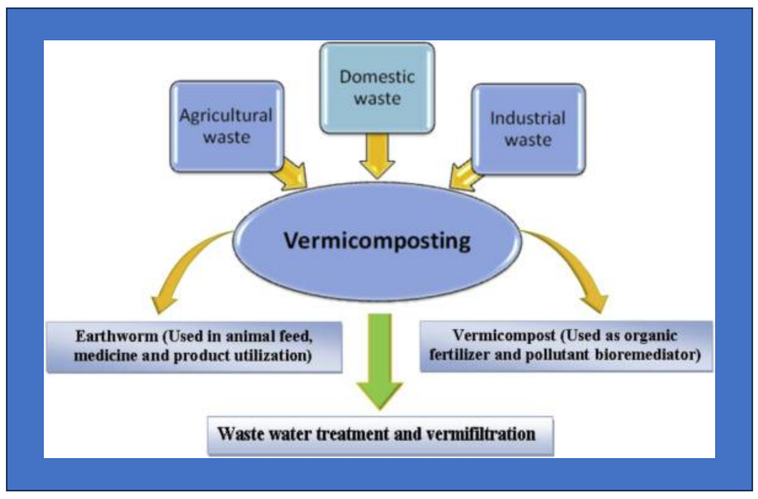
Introduction

Given the rapid global population growth, transitioning to agriculture based on "Green Deal" principles is vital for ecological resilience, sustainability, and universal access to healthy food. Aquaponics (AP) provides eco-friendly food chains with improved resource efficiency and resilience.



This approach can be strengthened by using unconventional water sources, adopting vertical farming, reducing fish meal in aquafeeds, and repurposing system residues for agronomic gains.

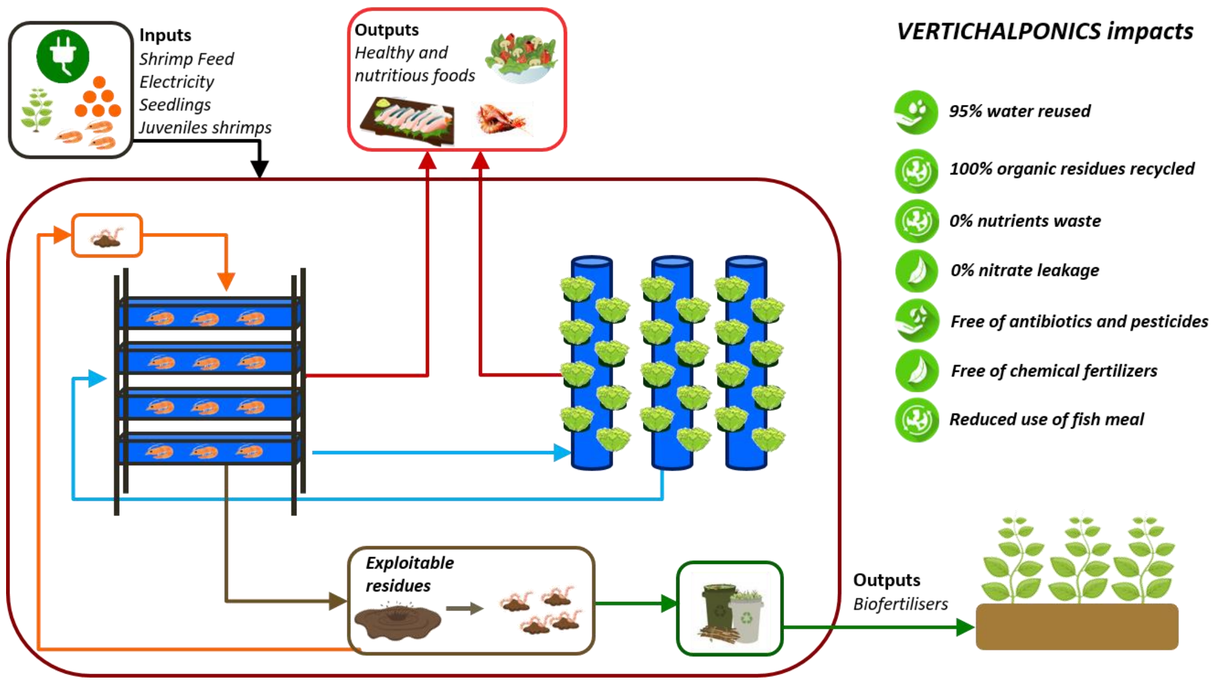
This evaluation is conducted through a combined Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) analysis, adhering to established standards (EN ISO 14040-44 and ISO 15686-5:2017).



System expansion will assess the positive impact of reducing environmental burdens through by-product recovery, particularly sludge utilization. Employing methodologies like Recipe and IPCC 2013 Global Warming Potential 100a, environmental impact indicators will be analyzed across mid-point and end-point categories to evaluate the system's direct global warming potential.

VERTICHAMPONICS project

The aim of the project is to study an innovative food production system to exploit brackish water for producing sustainable and high valuable foods:

- Saving water resources in food production;
- Selecting resistant and resilient vegetable crops;
- Selecting adaptable and high valuable aquatic species for vertical haloponics systems;
- Reusing and exploiting wastes.

Visual conclusion