

Stop the eutrophication of the oceans

O Zero **soil.**
Zero **water.**
Zero **pesticides.**
Zero **CO₂ pollution.**
ZERO GARDEN

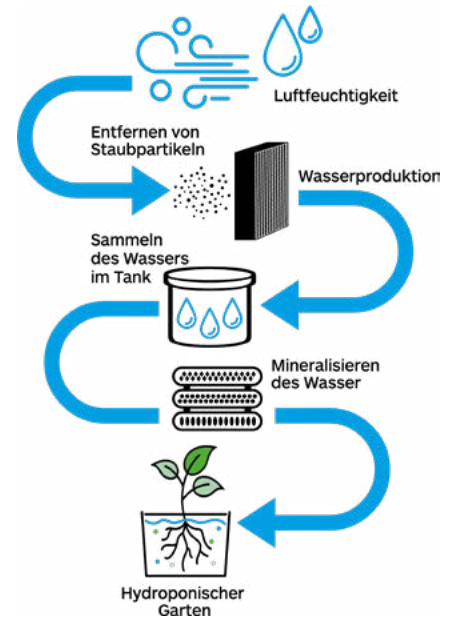


The eutrophication of the oceans has become apparent in recent years through toxic algal blooms, oxygen depletion, loss of biodiversity and fish kills. It is estimated that around 80 percent of marine ecosystems are affected by eutrophication. One of the main causes is extensive agriculture. At the same time, global food security is at risk, as more frequent droughts, floods and low water levels are also increasing the pressure on the world's freshwater resources.

The Düsseldorf marina has had problems with blue-green algae, fish and bird mortality for years. The Rhine also continues to be heavily polluted and carries its nutrients into the North Sea.

To mitigate the effects of global eutrophication of marine ecosystems, we have developed the Zero Garden, a floating hydroponic harbor farm that grows water and climate-neutral tomatoes and lettuce in a harbor.

The aim is to initiate a systemic change in the sustainable production of food, which otherwise contributes to high levels of eutrophication through conventional agriculture. The hydroponic system was developed in collaboration with the Fraunhofer Institute IGB. Another aim is to use these floating gardens to anchor nature-based solutions, such as floating plants in harbors, which directly eliminate algae on site. The first prototype floats in Düsseldorf's Medienhafen and was built by the company itself. The measure is accompanied by sustainability communication.



Zero Water & Soil

We have installed an AWG atmospheric water generator in a closed, well-ventilated 20-foot sea container. This extracts the moisture from the incoming air and condenses it into water. In this process, a UV filter removes viruses from the water and enriches it with minerals to produce pure drinking water.

The purified water is pumped into a stainless steel tank and enriched with an optimum concentration of nutrients for the plants (instead of soil). Salads, tomatoes and other vegetables are cultivated in stainless steel containers using a “deep water culture” cultivation method.

Plant LED lighting provides the optimum light spectrum for growth. The pilot plant is controlled by green shore power and a 2 KW solar power system.



Zero Pesticides & CO₂

In this closed, weather-independent system, no environmental toxins are used that lead to eutrophication. Local cultivation eliminates virtual water and food miles caused by Europe-wide transportation.



Floating farms with biodiversity performance with plant islands. The floating Zero Garden in Düsseldorf's Medienhafen was designed by us in such a way that it also provides an important biodiversity service for the marine ecosystem via docked plant islands.

The plant islands regulate the climate by shading the water and thus reducing water evaporation. The aquatic plants and the colonized microorganisms clean the water of phosphates and nitrates and thus ensure that toxic blue-green algae do not form. Fish prefer to spawn in this aquatic ecosystem.

Our cooperation partners

- Armacell: Insulation made from recycled PET rigid foam boards
- Amtico: Sponsoring of a bacteria-free floor
- Solar boat projects: Sponsorship of a PV system

This project supports the following UN Sustainable Development Goals:



The SDGs, or Sustainable Development Goals, are 17 global goals for sustainable development set by the United Nations in 2015. These goals are to be achieved by 2030 and include issues such as poverty, hunger, health, education, equality, the environment and peace.

Explanation:

The SDGs are a comprehensive plan to create a sustainable and just world for all people. They are based on the recognition that economic, social and environmental progress are closely linked and interdependent. The goals are designed to help tackle the biggest challenges of our time, such as poverty, hunger, climate change and inequality.