Land-based Aquaculture - Sustainable!

Avemarg, Tonya (School: Gymnasium Altenholz)

The project “Land-based Aquaculture - Sustainable!” has the goal to study an aquaculture system on land that provides marine biomass with unpolluted water. The system's development is a solution for the issue of polluted waste waters from aquacultures and an innovative way to generate valuable food. The further utilization of waste nutrients is the key to generate biomass and utilize polluting waste nutrients like organic debris or inorganic fertilizer. Applied to the model aquaculture system in our garden this means that next to the typical fish several other species that profit from their waste nutrients are cultivated. Like algae which grow from the inorganic fertilizers caused by excrement and food particles, or even shrimps who feed on the lost food particles that would normally pollute the water. To study the application of this “nutrient utilization” principle the model aquaculture (240 1 Baltic Sea water, three connected ponds) is used as the experimentation system. The method is to use the monitoring of Nitrate and Phosphate as an indicator for the functionality of the waste nutrient utilization. To achieve a “zero waste” system several purposeful changes like the adaption of algae' biomass were applied. This method is executed to find out which species are potential and how their biomass ratio must be planned to design such a sustainable aquaculture system. The results indicated for instance that for achieving a “zero waste” system much algae biomass is necessary, while the dam worm is a more efficient consumer.

Awards Won: