

Landbased freshwater IMTA-systems for urban aquaculture

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Conventional fish monoculture is based on linear production processes which are characterized by inefficient utilisation of natural resources (e.g. fuel, feedstuff, water). Furthermore they contribute to the deterioration of aquatic ecosystems and the overfishing of fish stocks.

Particularly in marine environments Integrated Multitrophic Aquaculture (IMTA) has been proposed as a solution to many of the problems posed by currently applied industrial aquaculture practices. By combining different organisms based on their ecological function we can create an aquaculture system of increased profitability while simultaneously minimizing impact on the surrounding ecosphere.

IMTA systems are commonly based on the combination of species belonging to three different trophic groups:

- Fed aquaculture species: e.g. fish, shrimp
- Organic extractive species: e.g. shellfish, sea cucumber
- Inorganic extractive species: e.g. algae, plants

Aquaponics can be considered as a particular type of freshwater IMTA system: terrestrial plants extract dissolved inorganic nutrients excreted by fish. However aquaponic systems are only composed of fish and plants and lack organic extractive species.

Our goal is the refinement of the aquaponic concept by:

- Incorporating organisms belonging to all three IMTA groups. Thereby minimizing feed input & waste output.
- Optimizing of system design to adapt rearing conditions according to the requirements of IMTA species assemblages & to reduce energy consumption.
- Creating an site independent production system adapted to the requirements of the German market situation suitable to produce a multitude of different commercial valuable species of animals & plants in proximity to urban centres.

