

# Perspectives and limits for the development of a sustainable aquaculture

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13h30 – 15h00

Botanical Garden Museum Berlin

The growth of world population is expected to nearly stabilize at just above 10 billion persons after 2062 (UN 2012) and causes challenges concerning security of water, food, and energy for mankind in the 21<sup>st</sup> century. Water is the primary resource for life and the main input to produce agricultural goods in the field and in the entire agro-food supply chain. Agriculture is the largest global user of water, accounting for 70% of total withdrawal, and the food production and supply chain consumes about 30% of energy produced globally (UN, 2014).

Thus, water, food, and energy are inextricably linked as the water-food-energy-nexus that has to be managed in a sustainable way concomitant with the protection of the environment for maintaining also biodiversity. Due to globally limited resources concerning space, freshwater, nutrients to fertilize plants, feed to rear and produce animals, and fossil energy there is an urgent need to go for sustainable animal protein production by fish using concepts of value added chains concomitant with lowering adverse environmental impacts.

In addition, we have to face climate change that increases meteorological perturbations and water scarcity to diminish agricultural field production, which leads to a trend to increase the more efficient indoor production in greenhouses. The overfishing of sea is setting limits for the use of natural fish populations (FAO 2014) and fostering sustainable aquaculture production of fish for food security.

This workshop aims to discuss:

- (1) Pros and cons for fish aquaculture;
- (2) advantages of fish aquaculture for animal protein production;
- (3) economy versus sustainability of fish aquaculture;
- (4) integration of aquaculture as value added chain into agriculture systems;
- (5) limits for fish aquaculture expansion;
- (6) perspectives of fish aquaculture.

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## *Agenda*

**Sven Würtz (IGB)**

*Feed sources for fish nutrition*

**Werner Kloas (IGB)**

*Aquaculture as value added chain in agriculture*

**Martin Tschirner (ADTI/IGB)**

*Insects as alternative feed source*