

Managing Ecosystem Impacts in Aquaculture through RAS in Netherlands

Background:

The Dutch finfish aquaculture sector is unique in the World and based solely on RAS. The sector was developed with the application of RAS in the seventies and eighties, and nearly exclusively applies RAS technology in indoor farming systems for several species, such as African catfish, eel, tilapia, sturgeon, pikeperch, barramundi, turbot, sole, yellowtail kingfish and others.

Intervention: RAS offers a variety of benefits to fish producers in comparison to open pond cultures. Some of them are listed below.

- Maximizes production on a limited supply of water.
- Low land requirements.
- Ability to control water temperature.
- Independence from adverse weather conditions.
- Nearly complete environmental control to maximize fish growth.

Impact:

From an environmental point of view the input into RAS is mainly fish, nutrients water and energy. The nutrient retention by fish inside a RAS is more efficient compared to other husbandry organisms in other animal production systems.

RAS systems are more efficient in terms of water use. The most important output of the operation are fish as end product and the emitted nutrients as a waste product. Compared to ponds, RAS emits waste from the system in higher concentrations and at clearly defined emission points which allows for easier waste management.

The environmental impact of RAS is rather limited as normally end-of-pipe treatments are included in the system setup.

New technologies are focusing on the integration of low trophic species converting the fish sludge into valuable secondary products e.g. other fish species, worms, algae, etc. The generated sludge, bioflocs, are reused then as fish feed.

Comparison of catfish RAS in Netherlands with pangasius culture in Vietnam shows lower CO₂ emissions from Dutch production during production and processing processes, including feed production.

Learnings for India: Government may support and/ or encourage research and pilot projects using RAS/ biofloc technology. This may include partnering with large scale fish farmers through production agreements. Moreover, some of existing facilities used for demonstration may be upgraded into commercial fish farms and leased out to a group of entrepreneurs.

Source: Advancing the Aquaculture Agenda: Workshop Proceedings, OECD,
<https://www.slideshare.net/AndrewAyuka/project-report-presentation1-49262229>