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Recirculating aquaculture systems (RAS) can have sustainability benefits over open systems but these need attention at the design stage — A theoretical ground for practice-oriented research

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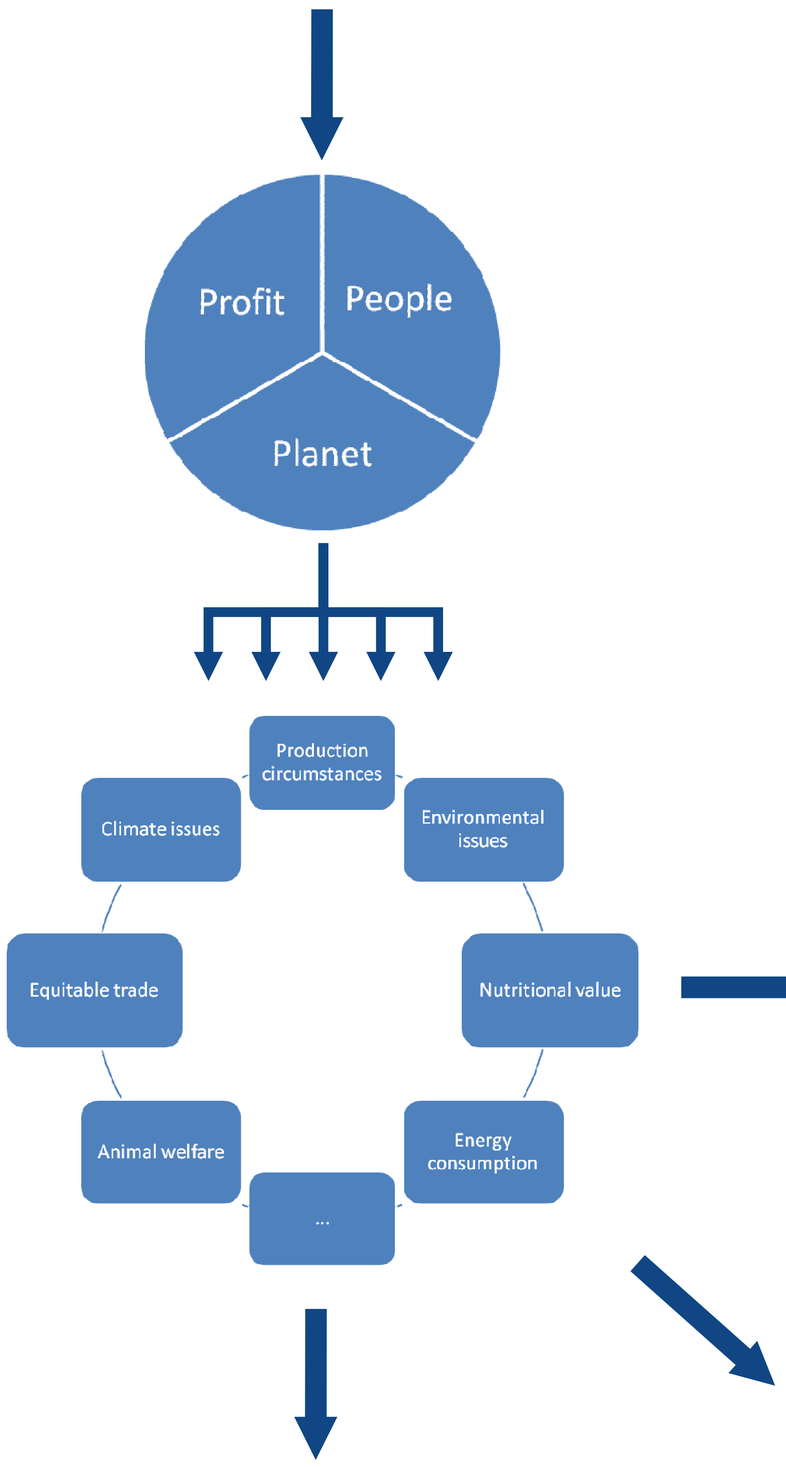
Research conducted within the framework of:

Funded by:

Sustainability

"to meet present needs without compromising the ability of future generations to meet their needs."



Economic issues in RAS

- Technological complexity ⇒ high installation cost is a risk
  - All fish needs to be fulfilled by the RAS
- Economical performance is not only fish productivity
  - Energy use
  - Water use
  - Feed conversion ratio
  - Pharmaceutics use
  - Labour intensity and cost
  - Often volatile market situation
- Major disadvantage in densily populated, industrialised countries (e.g. Western Europe)
- Design for broad product price fork, not maximum fish productivity!

Social issues in RAS

- Attitudes to farmed fish and wild fish are comparable
  - Each type refused by ±10% of consumers
  - Refusal of farmed fish not rooted in sustainability arguments (refusal of wild fish is)
- Interest in fish origin is low
- Labour conditions must be supervised (less independent producers?)
- Social and political (non-)acceptance of RAS might be comparable to (peri-)agricultural activities
  - Negative in densily populated areas?

Ecological issues in RAS

- Energy
  - Look for local renewable energy (wind, heat pump, etc.)
- Water
  - Water recycling = core of RAS
  - Consider reuse of waste water (e.g. aquaponics)
- Nutrients
  - Optimisation of feed composition
  - Optimisation of feeding regime
- In RAS energy, water and nutrient use is "visible"
  - More controllable ⇒ ecologically beneficial?
  - Technological complexity may prove positive

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