Measuring sustainability in aquaculture and... acting on it!

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BlåBioNorge
30 November 2018
Stavanger

> 400
Labels


EPP
LICENSED
Sustainable Textiles
NATURTEXTIL
BIO
labono
MSC
www.msc.org
TERRACYCLE
waterwise
CERTIFIED
SCScertified
PESTICIDE RESIDUE
FREE
HQE
WQA
ECO
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ecma
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Grassfed
REST
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the
THE WALL
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greenta
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LEED AP
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GMO
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nongmoproject.org
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covil
LEI
WATER
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Sustainability?

- “…to meet the needs of the present without compromising the ability of future generations to meet their own needs” Brundtland commission of the UN

…to ask less of the planet‘s resources, we need to ask more of our creative self.

Sustainable Food
Ökobilanz - EcoDesign - Forschung

Sharing Economy

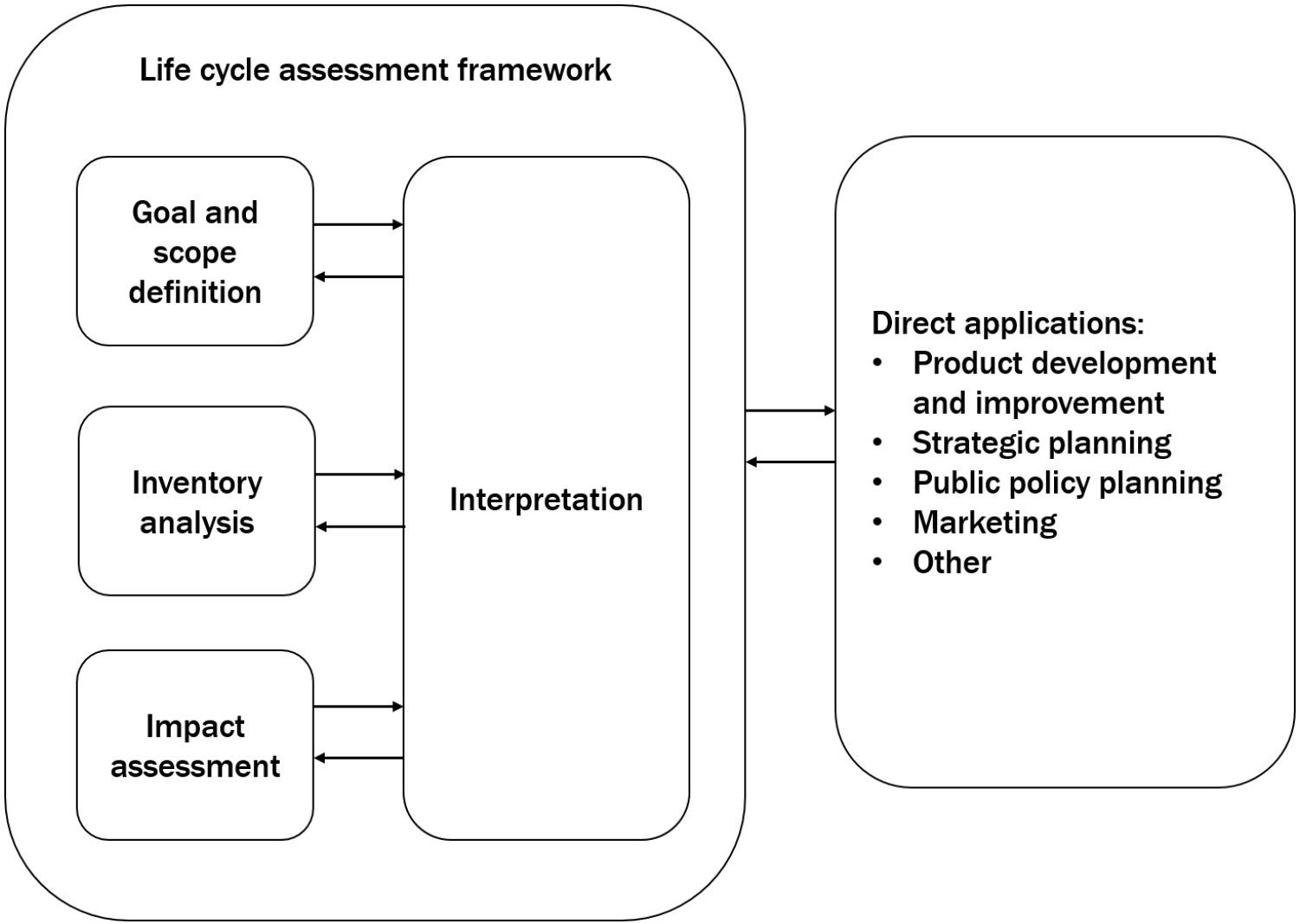
- Change of mentality – possessive to sharing
- Resources are re-used – circular economy


„If you can‘t measure it,
you can‘t improve it.“
Peter Drucker

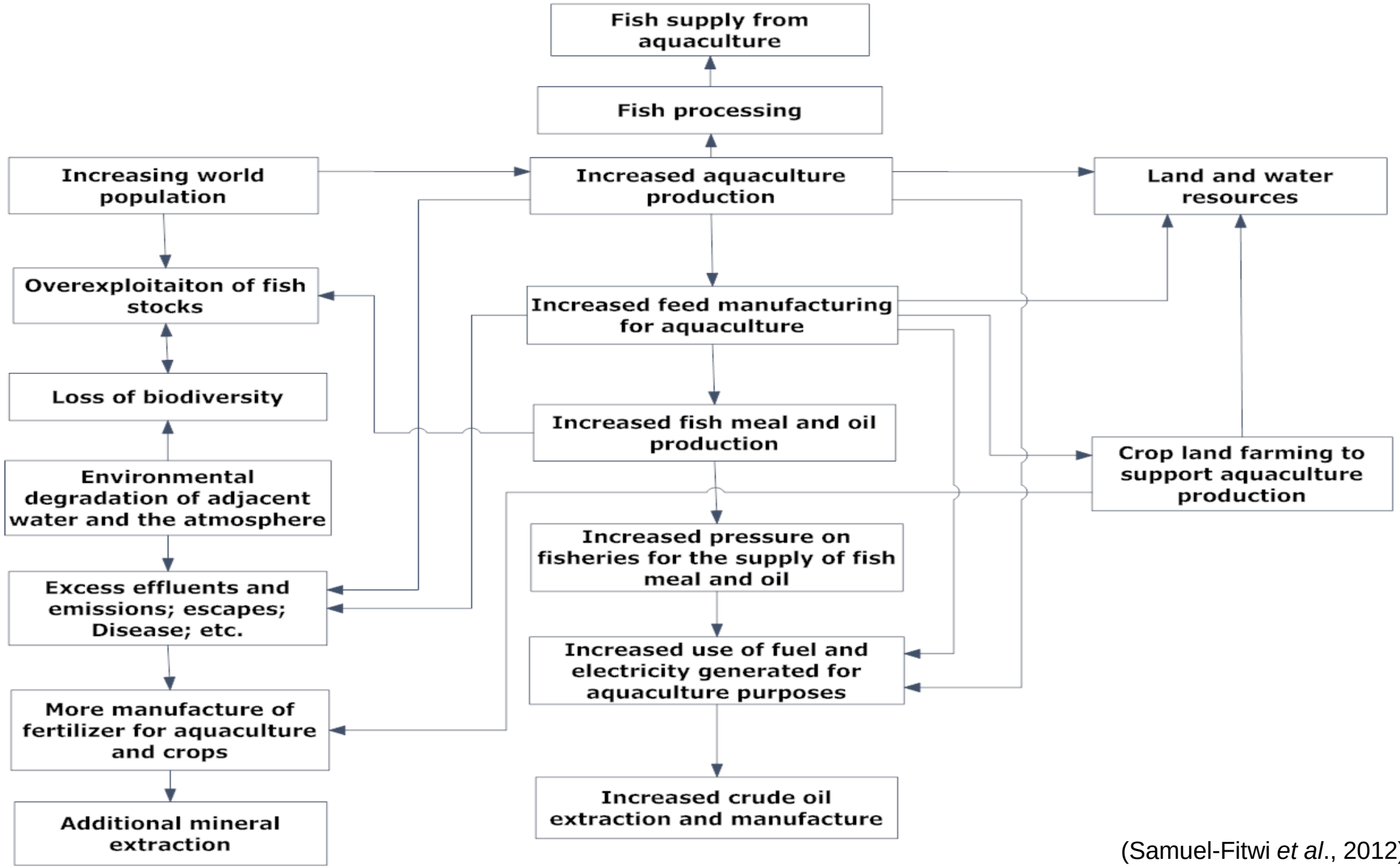
Life Cycle Assessment (LCA)

- **ISO standard 14040 and 14044 (2006).**
- **Quantitative measurement of potential environmental impact.**
- **Identify hotspots in the whole supply chain**

LCA framework

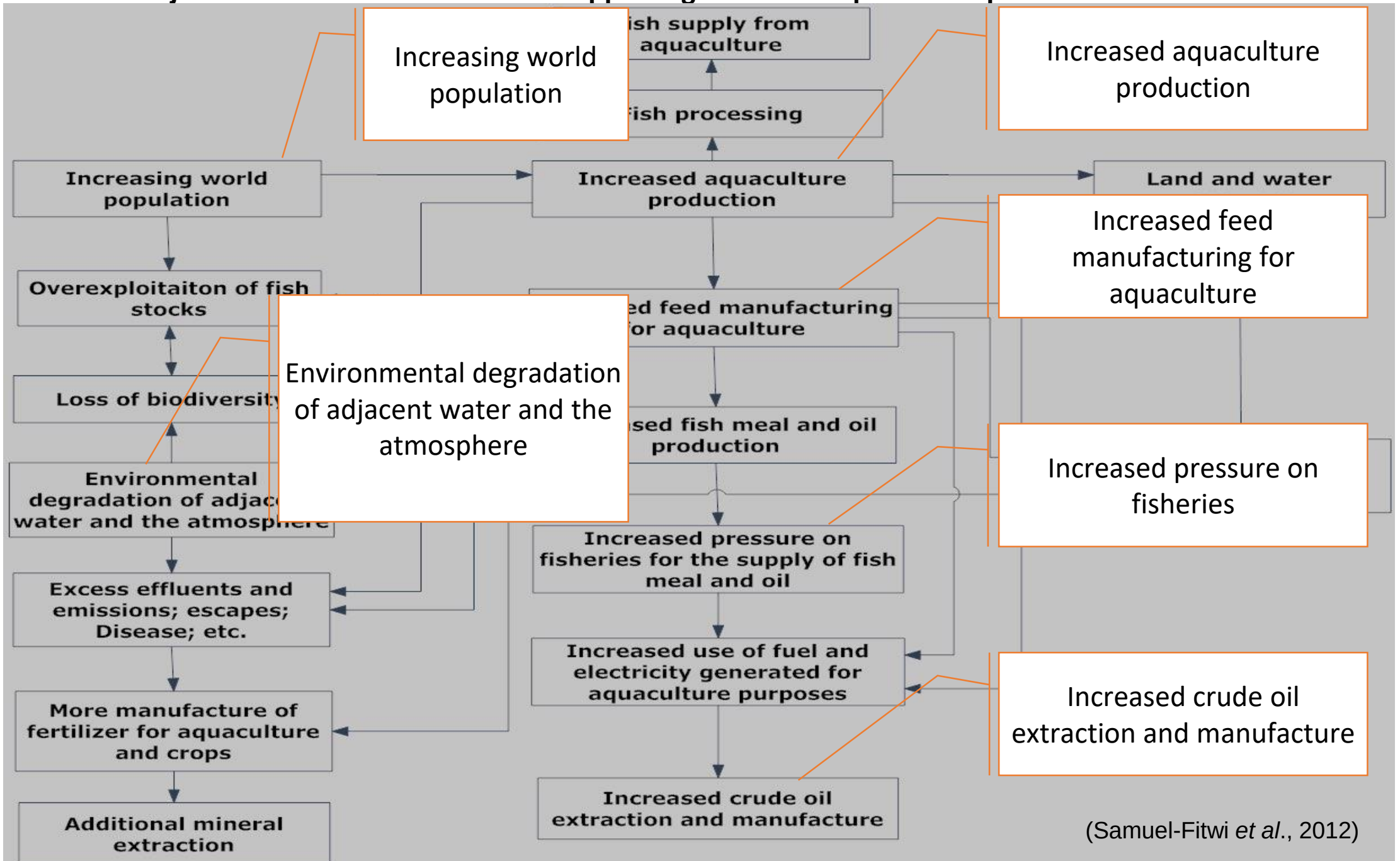


Major environmental interactions supporting increased aquaculture production



(Samuel-Fitwi *et al*., 2012)

Major environmental interactions supporting increased aquaculture production



(Samuel-Fitwi *et al*., 2012)

Laoning, China
Source: NASA

Comparative LCA

Aquaculture production systems

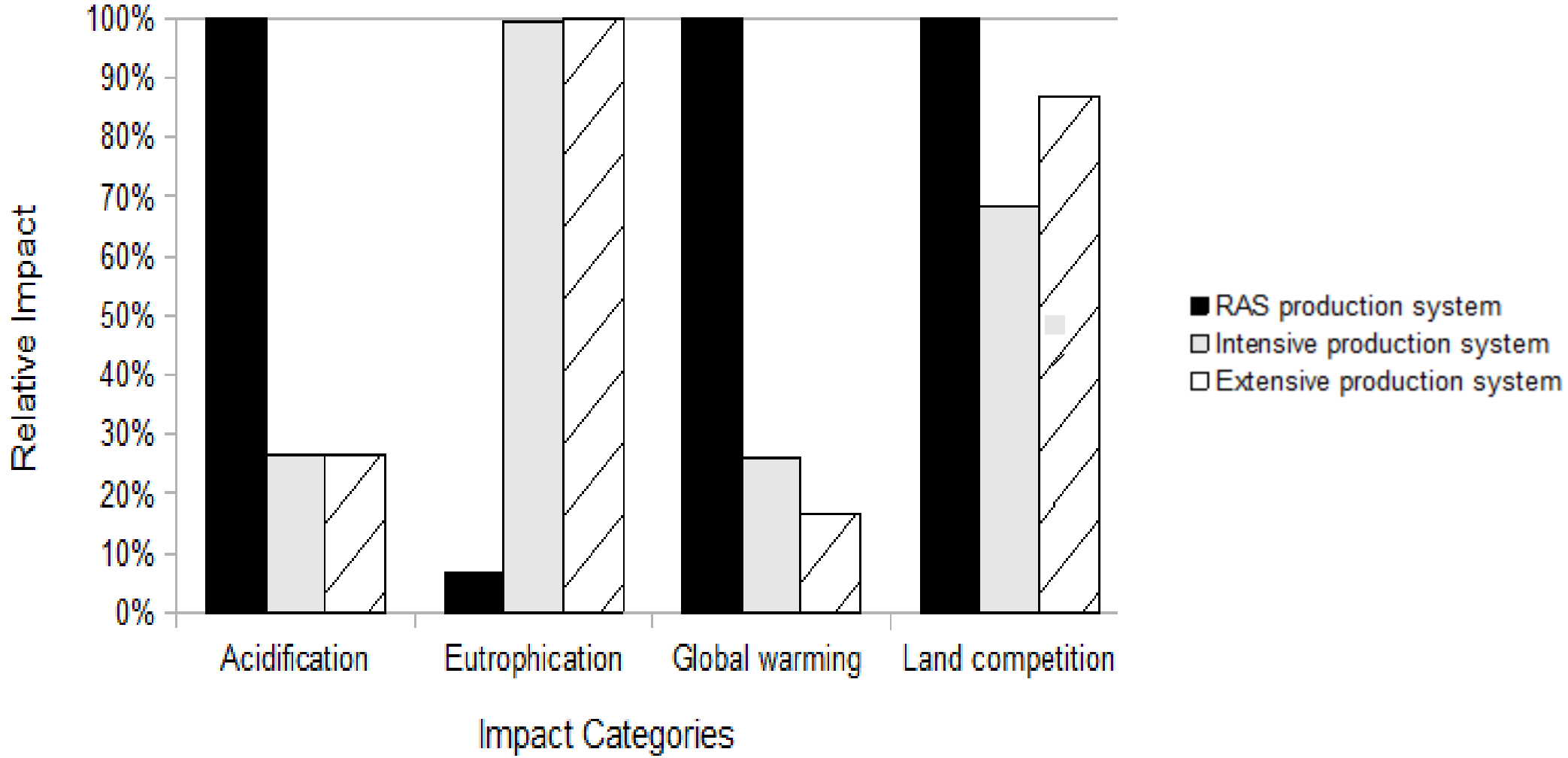
- Compare the impacts of the aquaculture production systems

IS

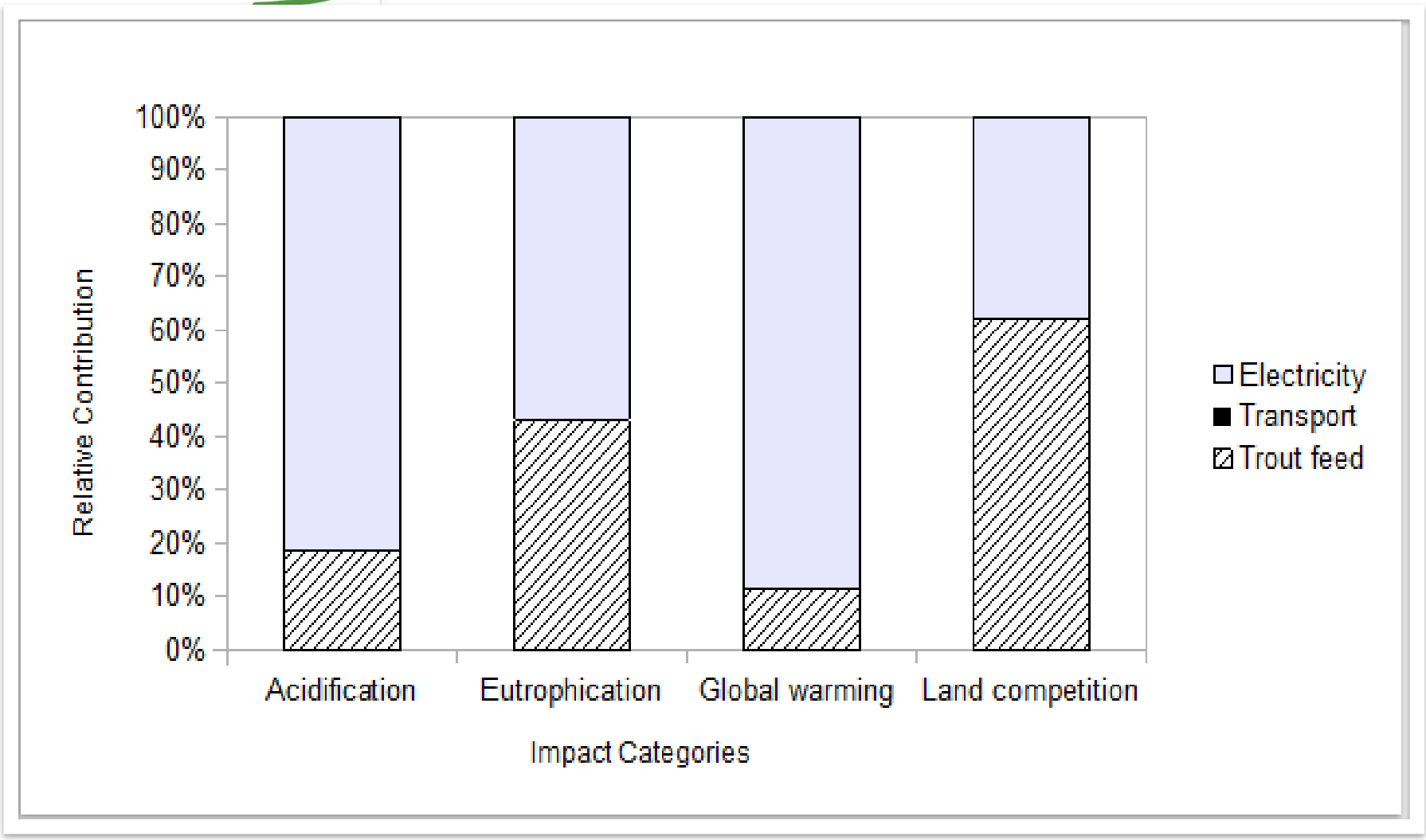
ES

RAS

Comparative LCA of trout production systems

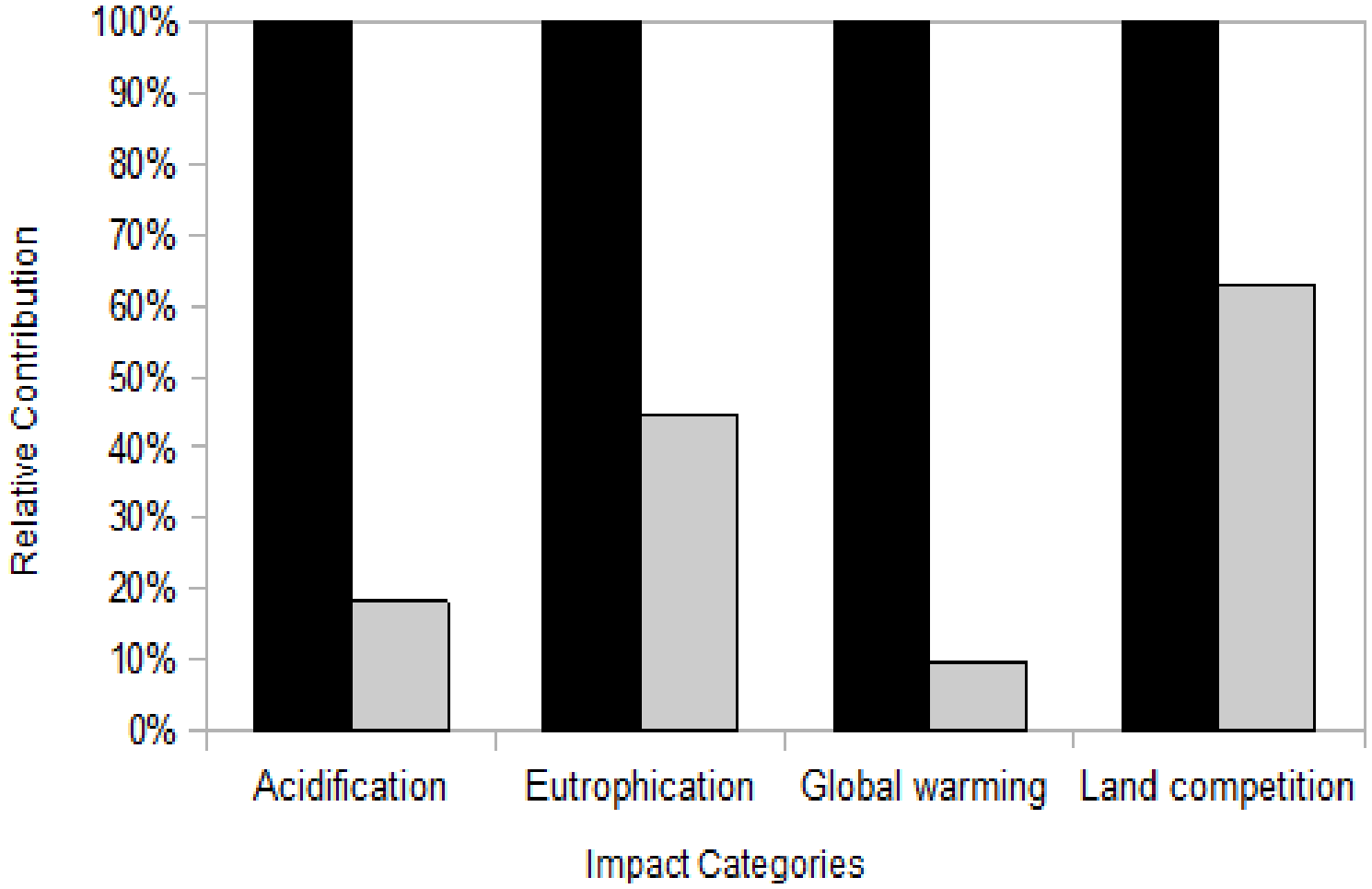


LCA of Rainbow trout – process contribution RAS



Comparative LCA - RAS

Improvement option for RAS using wind energy as alternative energy

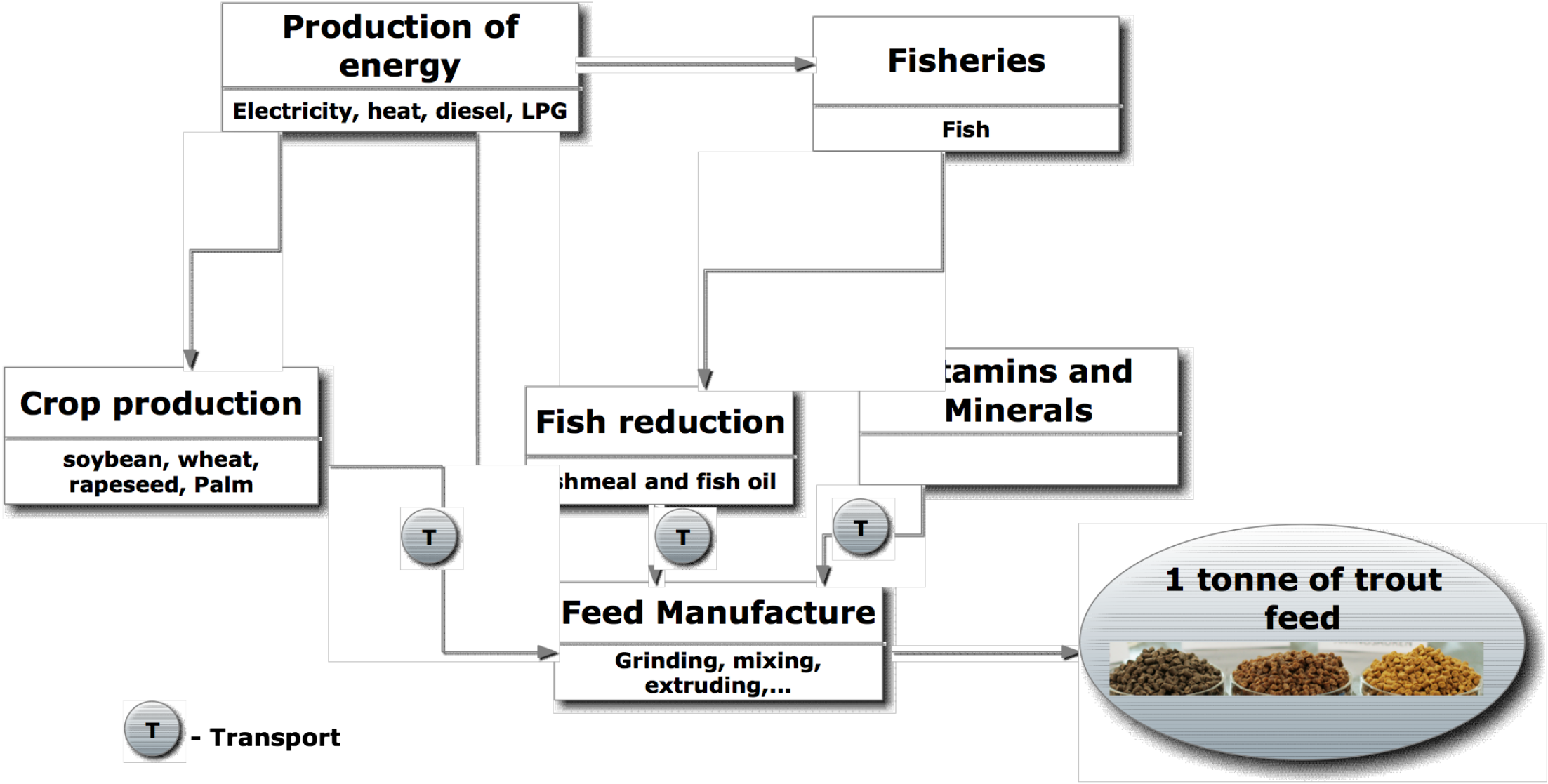


Grid Energy

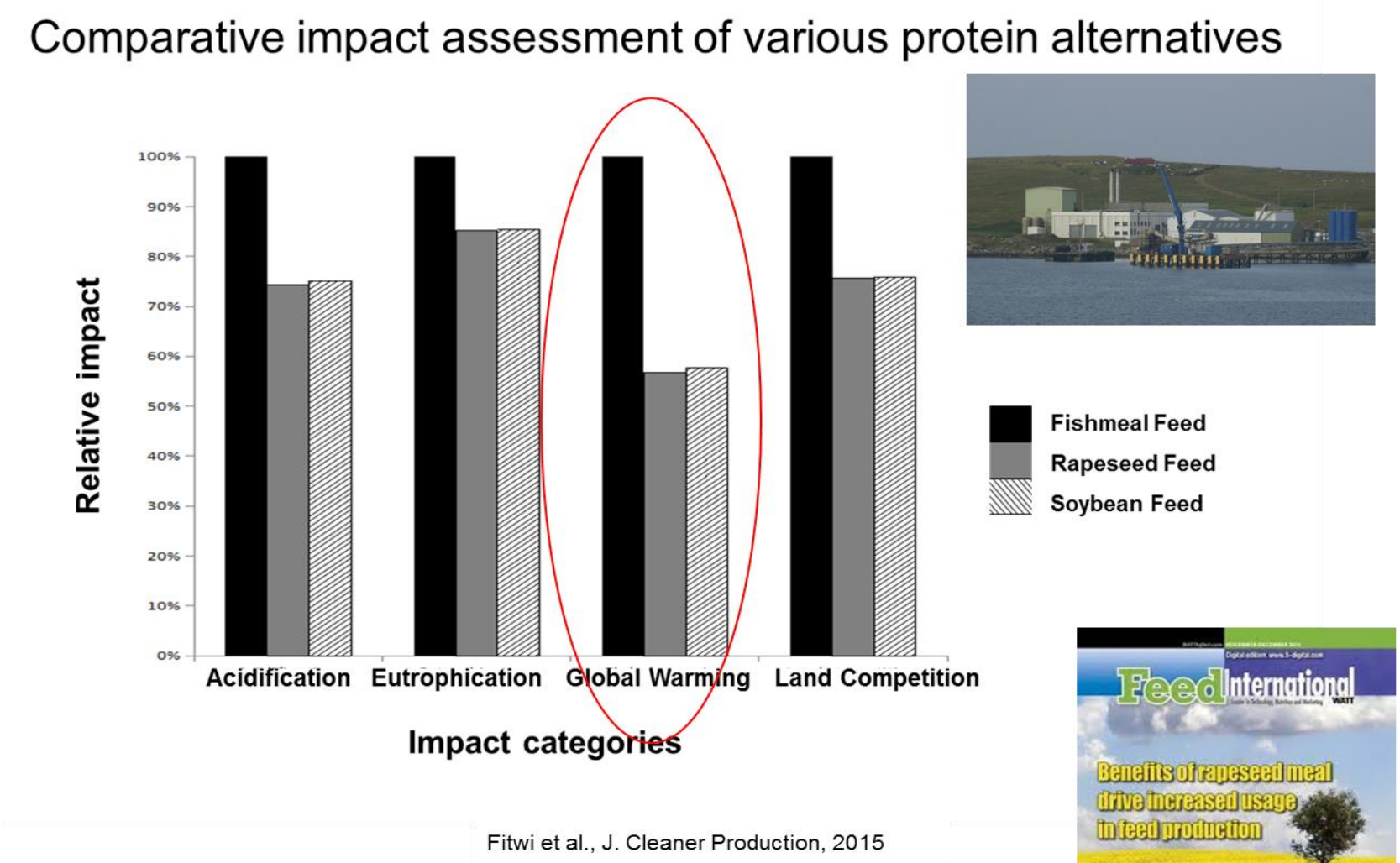
Wind Power

Fishmeal and fish oil

LCA of Aquafeed– System boundary



Evaluation of the environmental impact using Life cycle assessments (LCA)



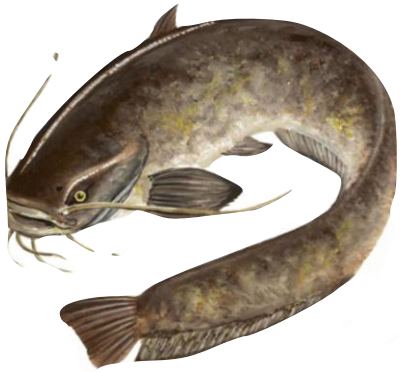
Fitwi et al., J. Cleaner Production, 2015

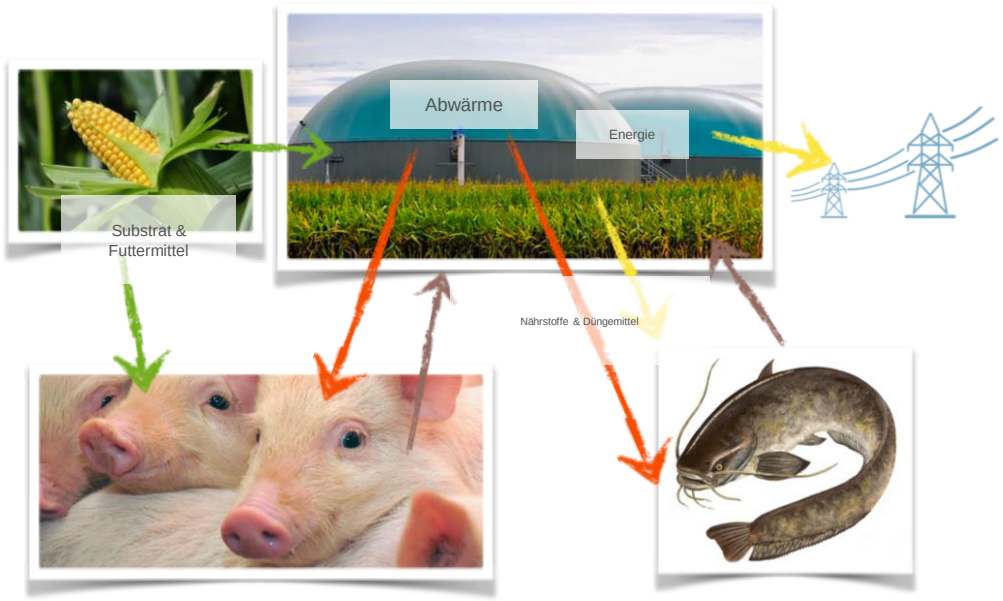
How do we continue…?

- Community aquaculture?
- Shared insect farms?
- Decentralized integrated agriculture and aquaculture systems?

Industrial references

LCA: African catfish





Energy: negative CO2- Footprint

Biogas, Swine farm & Aquaculture

REWE

PRO PLANET

Ecodesign -
Designing based on ecological benefits

PROBLEM


90%
overfishing
50%
fishery
50%
aquaculture
microplastics
antibiotics
eutrophication
land degradation
up to 2 yrs
of storage

FROM GLOBAL PROBLEM TO LOCAL SOLUTION

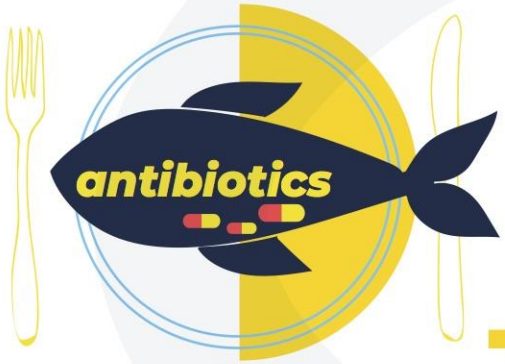
Global Food Production needs to increase by

70%

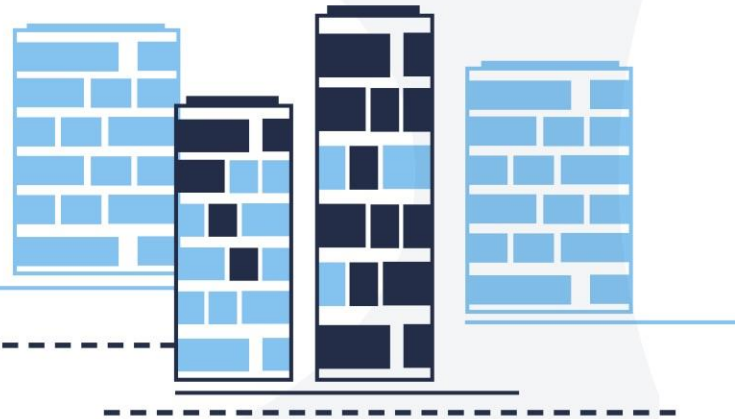
till 2050 (FAO)

NOT IN THE OCEAN.

NOT BY AQUACULTURE.



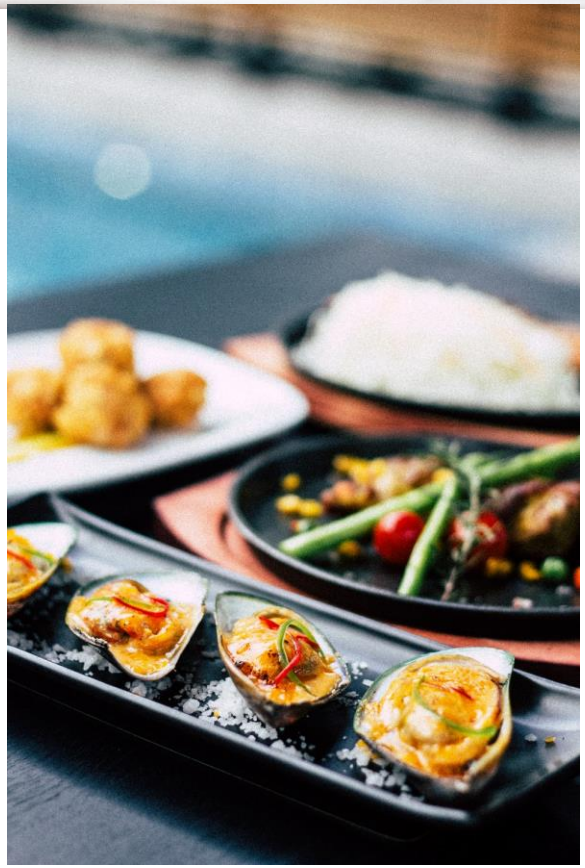
BUT IN THE CITY!



YES TO FRESH & HEALTHY FISH

aquacubes

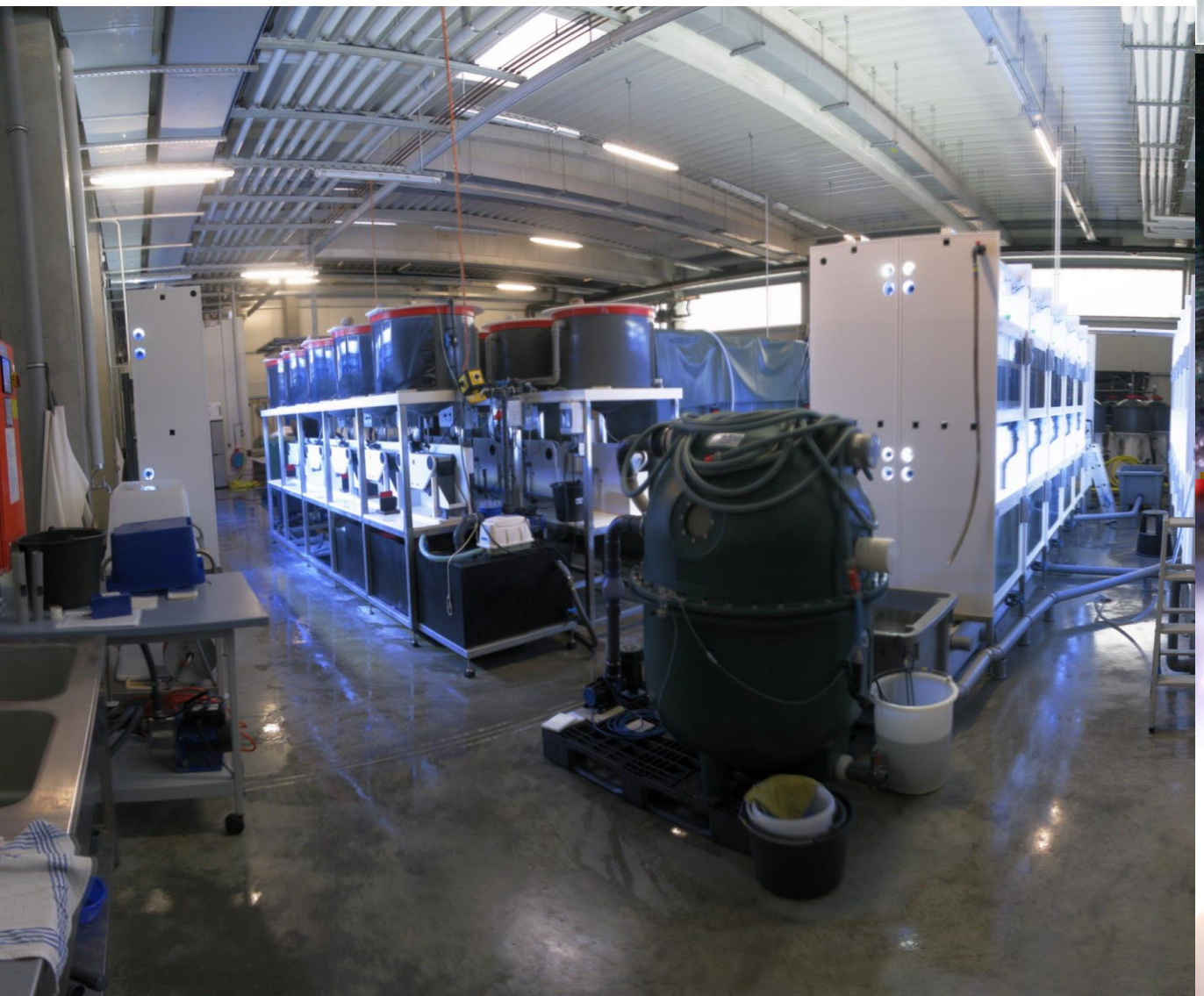
How do we produce and supply healthy FOOD?

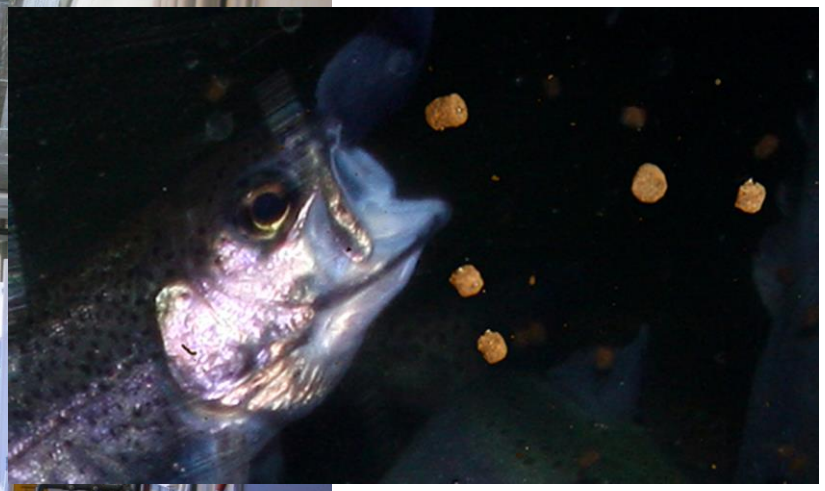


Insel Garten,
Berlin

Research

Steps for solving a problem





SOLUTION - AQUACUBES

Access to fresh and healthy fish

Participation in saving the oceans

Easy to use technology

Efficiency and economy

Variety of fish species

aquacubes

References & Networks

> 50 Aquaculture farms analysed, 10 countries

- Several contractual research projects

- NGOs, fish producers und retailers

Take home message

- ✓Innovation is not limited to research institutes, so please go out of the lab and do solution-oriented research
- ✓Technology like blockchain should be investigated to help communication and trust in LCI and LCA results.
- ✓Citizen science is a cheaper way of collecting data to validate our assumptions and reduce uncertainty

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Thank you

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