Aquaculture for fish proteins?

Studium Generale, 2 February 2016

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www.sarnissa.org
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Personal introduction
An introduction to aquaculture
Familiar and not so familiar images...

www.ah.nl

green-gourmet.dk
Capture fisheries & aquaculture 1950-2013

©Worldwatch Institute

Source: FAO
Value chain
Production systems for finfish

- Ponds
- Cages
- Recirculating Aquaculture Systems (RAS)
## Comparison of ponds, cages, RAS

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<th>Ponds</th>
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<td>Space</td>
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<td>High</td>
<td>Low</td>
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Tilapia feed ingredients

- Wheat bran: www.justingredients.co.uk
- Maize bran: www.kwalternativefeeds.co.uk
- Cassava flour: www.harvestmall.com
- Rice bran: www.triplecrownfeed.com
- Fish meal: www.rajfishmeal.com
- Blood meal: www.planetnatural.com
- Feather meal: www.antgrd.com
- Soyabean meal: gtigroup.eu
- Palm oil: www.homeopathy4health.ie
- Premix: bzlongfei.en.alibaba.com
Competing claims

www.alibaba.com

americastilapiaalliance.org

en.wikipedia.org
Competing claims
Feed Conversion Ratios

Looking at the different FCR proteins

- Beef: 1/8
- Lamb: 1/5
- Pork: 1/2.5
- Poultry: 1/1.8
- Sea bass: 1/1.4
- Prawn: 1/1.3
- Salmon: 1/1.2

www.ecoinvestor.com.au
World wide production (quantity)

Quantity in million MT (2012)

- Finfish: 44.151
- Crustaceans: 6.447
- Molluscs: 15.171
- Other species: 0.865
World wide production (value)

Value in billion USD (2012)

- Finfish: 87
- Crustaceans: 31
- Molluscs: 16
- Other species: 4
Production & export of Pangasius

Aquaculture Top 5 worldwide production and export
in metric ton

Data based on Pangasius

15% of EU import of tilapia, pangasius and shrimp ASC certified in 2015

www.idhsustainabletrade.com
Potential effects on livelihoods

- Food and nutrition security
- Alternative sources of income
- Resource competition: water, land, crops
- Coastal protection
- Health
- Consequences of potential environmental effects
Potential environmental effects

Highly dependant on production system!

- Mangroves & coastal protection
- Eutrophication due to nitrogen and phosphorous release
- Fall out of feed remains
- Anti-biotic & anti-fouling use
- Escapes & inter-breeding
Strengths

- Healthy and affordable animal proteins
- Favourable Feed Conversion Ratios
- Food and nutrition security
- Alternative sources of employment & income
- Multiple species available that feed on manure, algae
Weaknesses

- Competition with scarce resources: water, land, crops
- Feed costs, FCR > 1 for most species
- Reliable volumes and quality of fingerlings & feed
- Lack of management skills in developing countries
- Poor transition from public to private investment
- Health of employees
- Effective licensing procedures & enforcement
- Lack of efficient logistics & cold chains
- Effective site allocation
Opportunities

- Increasing middle class, high demand
- Offshore availability of space
- Building with Nature & coastal protection
- Selection of high potential herbivorous species
- Integrated multi-trophic aquaculture
- Aquaponics

dasdstemhowler.com
Threats

- Release of nitrogen, phosphorous
- Cutting of mangroves, reduced coastal protection
- Climate change & sea level rise
- Competing claims
- Reduced coastal protection
- Diseases & anti-biotic use
The future of our seas
Direct global drivers

Unequivocally influence ecosystem processes (MEA 2005)

- Demographic
- Economic
- Socio-political
- Cultural and religious
- Scientific and technological
- Physical and biological
Indirect global drivers

Operate more diffusely, by altering direct drivers (MEA 2005)

- Changes in climate variability
- Plant nutrient use
- Land conversion
- Diseases
- Invasive species
Four different scenarios

- Vital nature
- Liveable nature
- Functional nature
- Adaptable nature
Vital nature
Livable nature
Functional nature
Adaptable nature
Images of the future? - IMTA
Images of the future? – Wind and aqua
Images of the future? – Sand Engine
Images of the future? – Plastic collector

www.newslinq.com
Images of the future? – Aquaponics

www.cultures-aquaponiques.com
Thank you

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hubdesignsmagazine.com