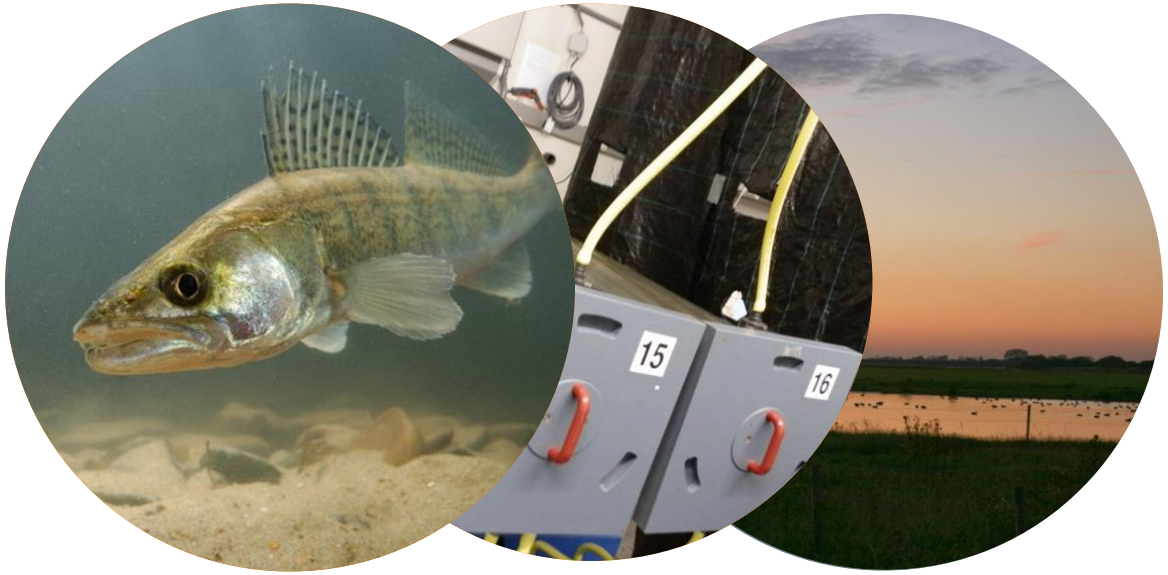
Aquaculture for fish proteins?

Studium Generale, 2 February 2016

Bas Bolman, Wageningen UR



www.sarnissa.org

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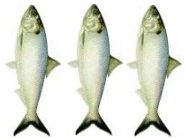
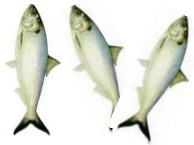


Aquaculture SWOT



The future of our seas

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Personal introduction

www.hofhuys.info

zoom.nl

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www.ecomare.nl

www.kennislink.nl

wandelfotosite.nl

www.ecomare.nl

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An introduction to aquaculture

Familiar and not so familiar images...

green-gourmet.dk

www.ah.nl

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www.nortrade.com

www.theguardian.com

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vietnomics.wordpress.com

www.flickr.com

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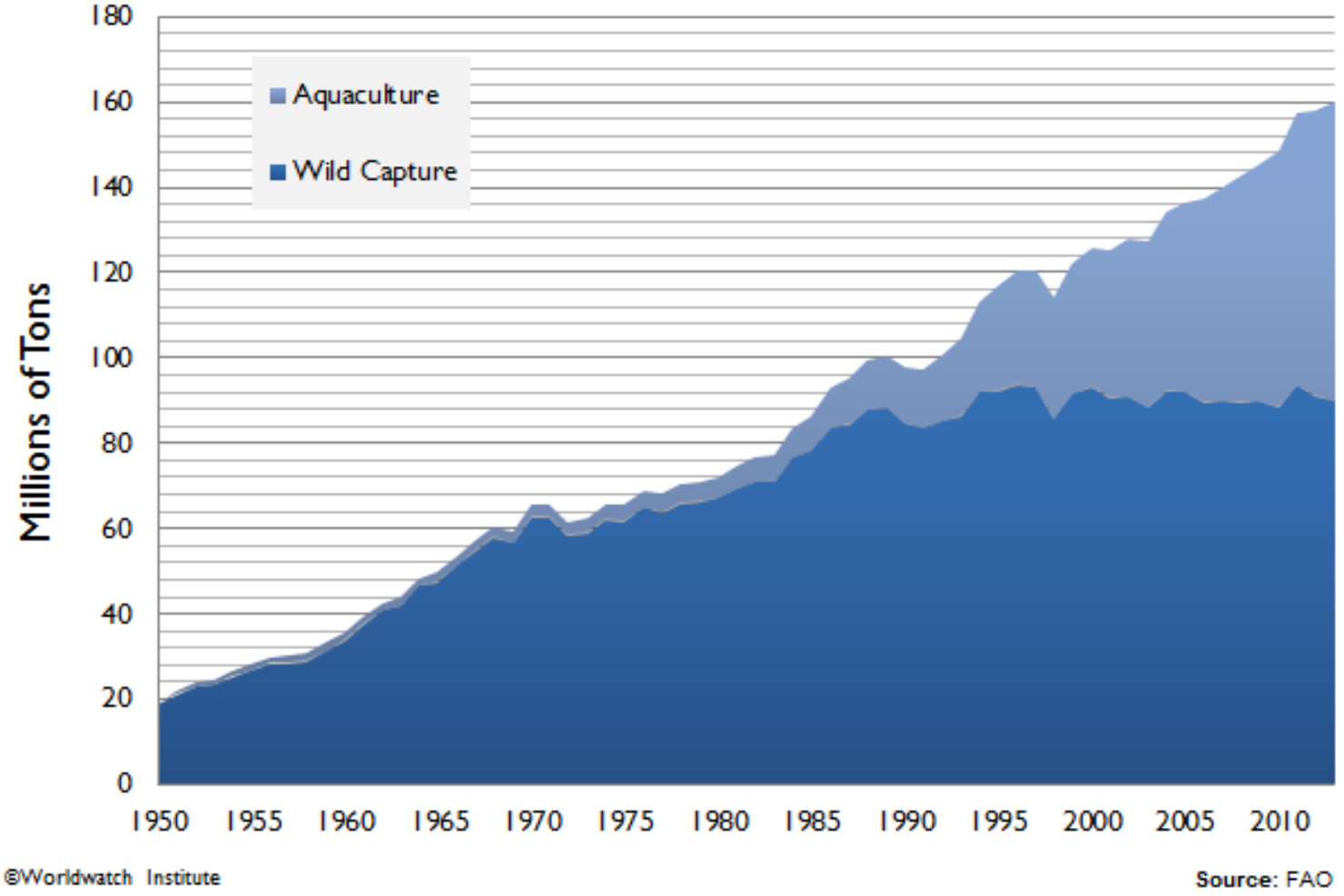
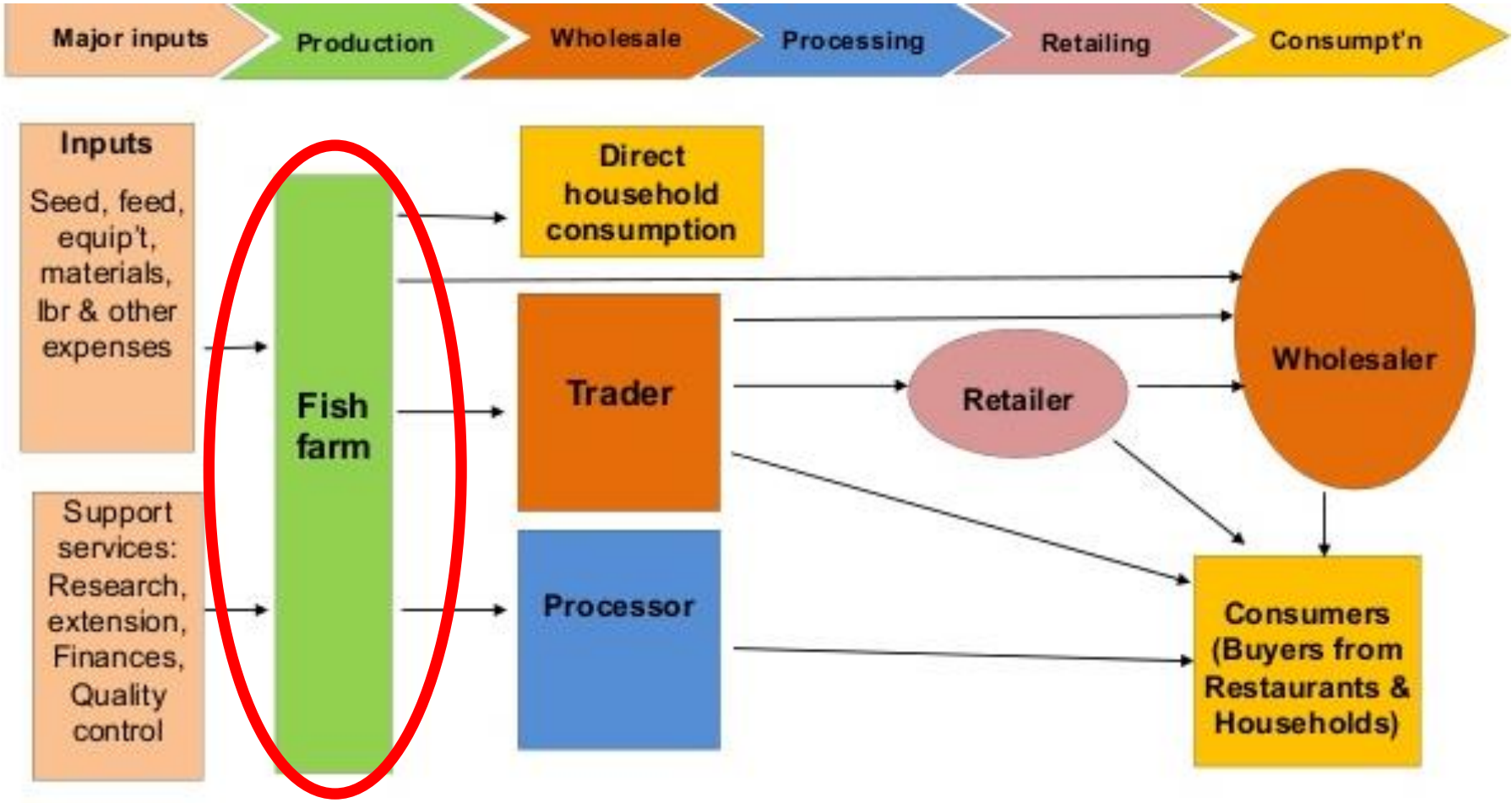
Google Earth

Capture fisheries & aquaculture 1950-2013



Value chain



www.slideshare.net

Production systems for finfish

- Ponds
- Cages
- Recirculating Aquaculture Systems (RAS)


Bas Bolman


Bas Bolman


prangerent.com

Comparison of ponds, cages, RAS

	Ponds	Cages	RAS
Control	Medium	Low	High
Electricity	Low	Low	High
Environmental impact	Medium	High	Low
Feed Conversion Ratio	Medium	High	Low
Small holders	High	Low	Low
Multi nationals	Low	High	High
Investment	Low	High	High
Space	High	High	Low

Tilapia feed ingredients

Fish meal
www.rajfishmeal.com

Blood meal
www.planetnatural.com

Feather meal
www.antgrd.com

Wheat bran
www.justingredients.co.uk

Maize bran
www.kwalternativefeeds.co.uk

Cassava flour
www.harvestmall.com

Rice bran
www.triplecrownfeed.com

Soyabean meal
gtigroup.eu

Palm oil
www.homeopathy4health.ie

Premix
bzlongfei.en.alibaba.com

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www.alibaba.com

Competing claims

www.alibaba.com

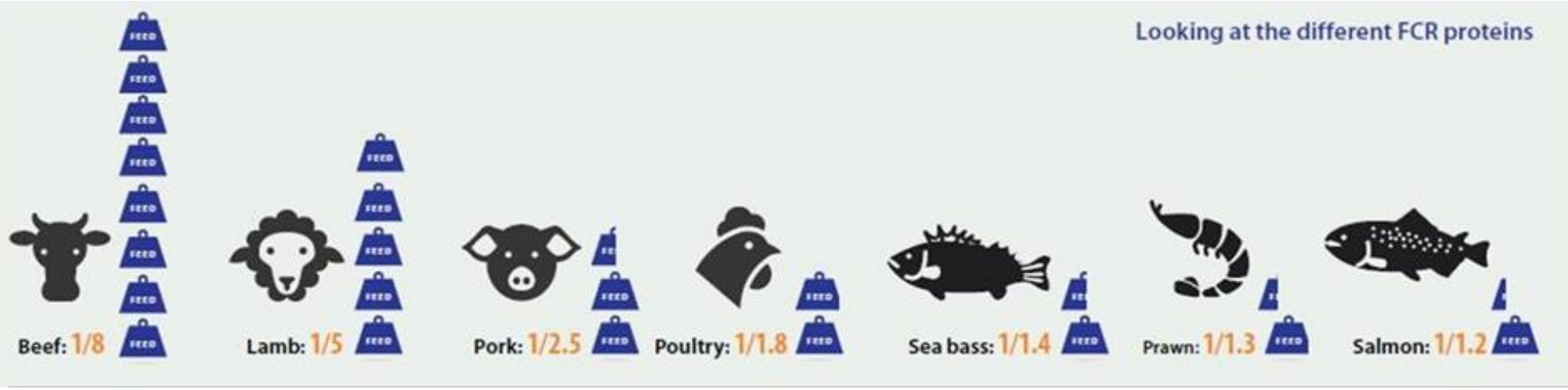
americastilapiaalliance.org

en.wikipedia.org

Competing claims

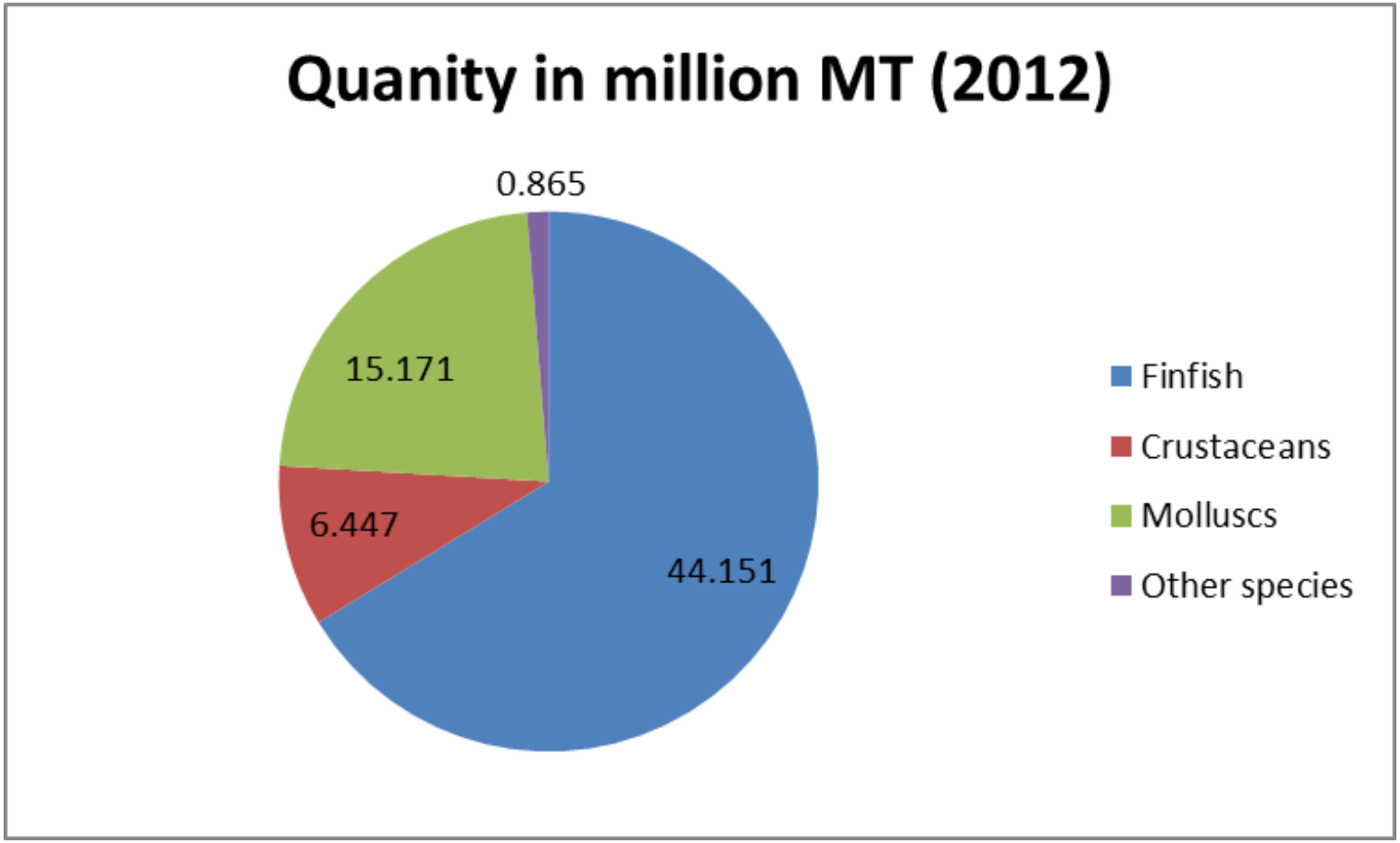
en.wikipedia.org

Feed Conversion Ratios



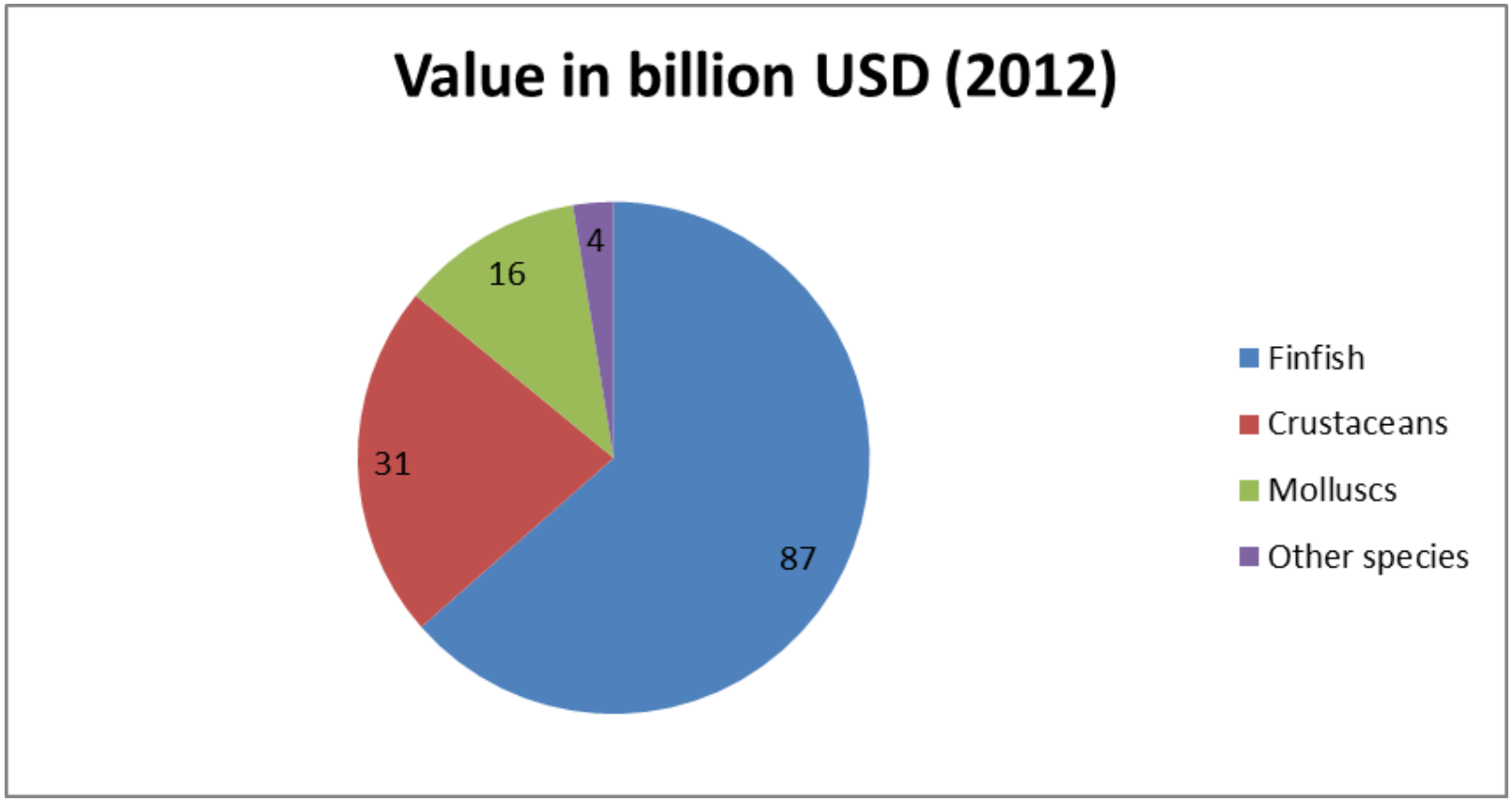
www.ecoinvestor.com.au

World wide production (quantity)

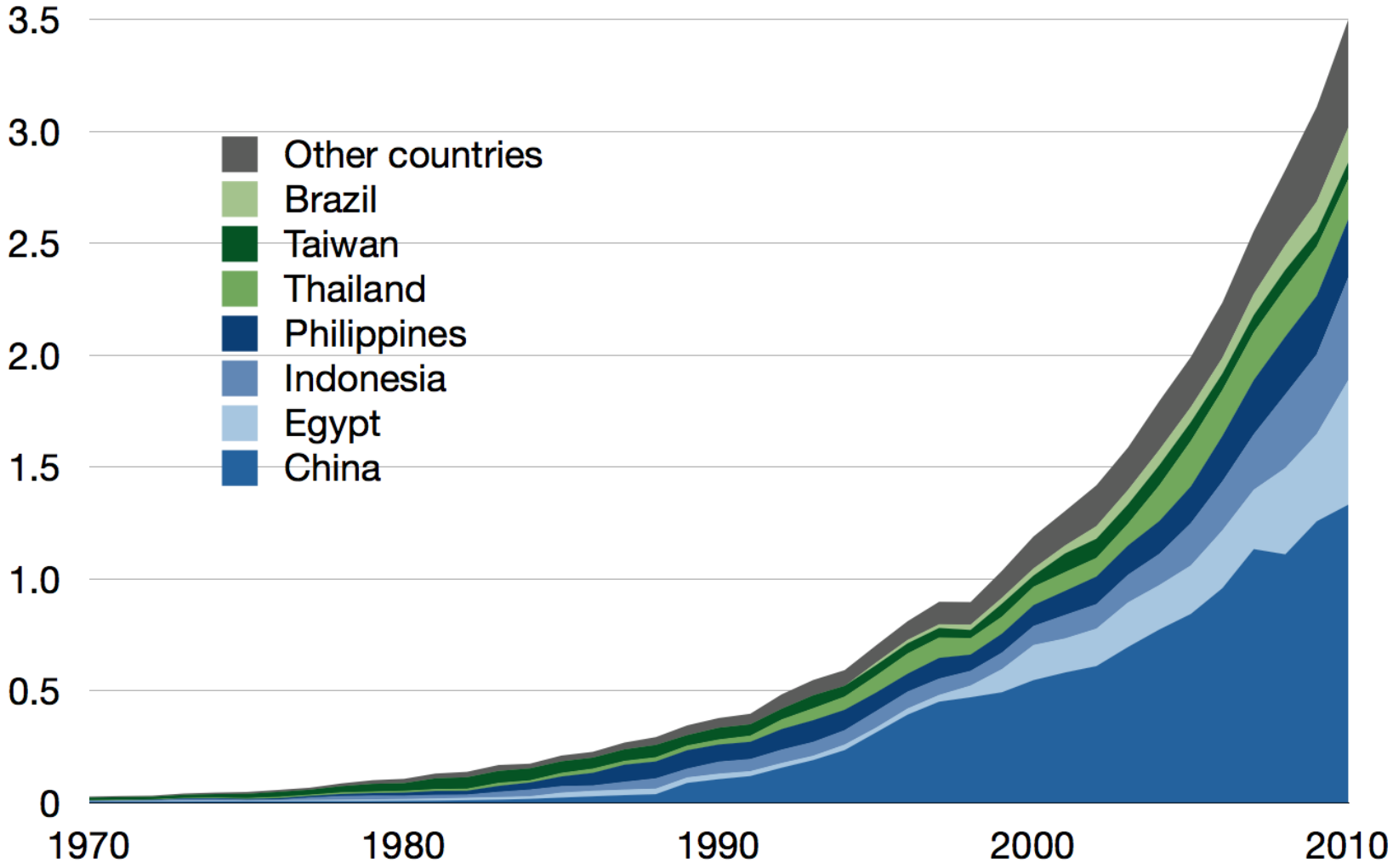


www.fao.org

World wide production (value)



Production of Tilapia (Million MT)



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Production & export of Pangasius

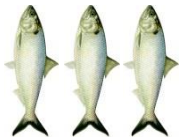
Potential effects on livelihoods

- 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



Aquaculture SWOT

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

www.fotothing.com

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

fatchicksfitness.com

Opportunities

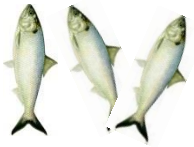
- Increasing middle class, high demand
- Offshore availability of space
- Building with Nature & coastal protection
- Selection of high potential herbivorous species
- Integrated multi-trophic aquaculture
- Aquaponics

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

kulavazha.blogspot.com



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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

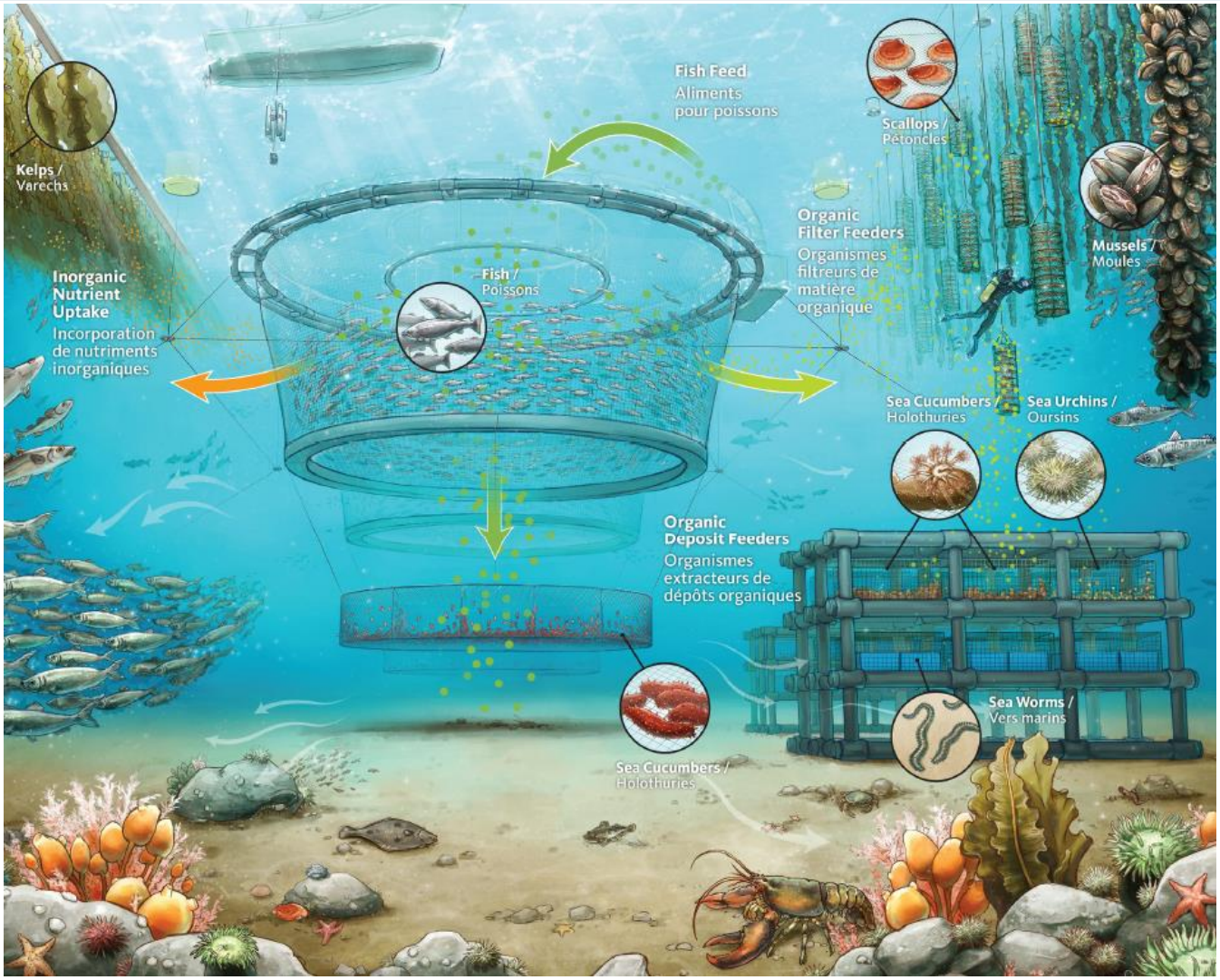
Vital nature

Livable nature

Functional nature

Adaptable nature

Images of the future? - IMTA



Images of the future? – Wind and aqua

Images of the future? – Sand Engine

defotograaf.eu

Images of the future? – Plastic collector

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www.newsling.com

Images of the future? – Aquaponics

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www.cultures-aquaponiques.com

Thank you

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hubdesignsmagazine.com

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