

What's Aquaculture's Role in a World Shaped by Climate Change?

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Olavur Gregersen

Olavur Gregersen has more than 30 years of experience as an entrepreneur. He is managing director of Ocean Rainforest in the Faroe Islands, one of the largest seaweed cultivation companies in Europe. Also he is the founding partner of Syntesa Partners & Associates, which provides research and innovation services within business development, project management and socio-economic impact analysis.

MANAGING
DIRECTOR
OCEAN
RAINFOREST

The Story of
OCEAN
rainforest

How to mitigate the effects of climate change with seaweed cultivation

Ólavur Gregersen, Managing Director, Ocean Rainforest

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Uptake of nutrients

No use of land, fertilizer or
freshwater

13 CLIMATE
ACTION



CO₂ uptake

Reduces global heating and
acidification of the oceans

14 LIFE
BELOW WATER



Creates ecosystems

Provides shelter, nursery habitat
and feeding chamber for fish and
other marine animals

High yield in comparison

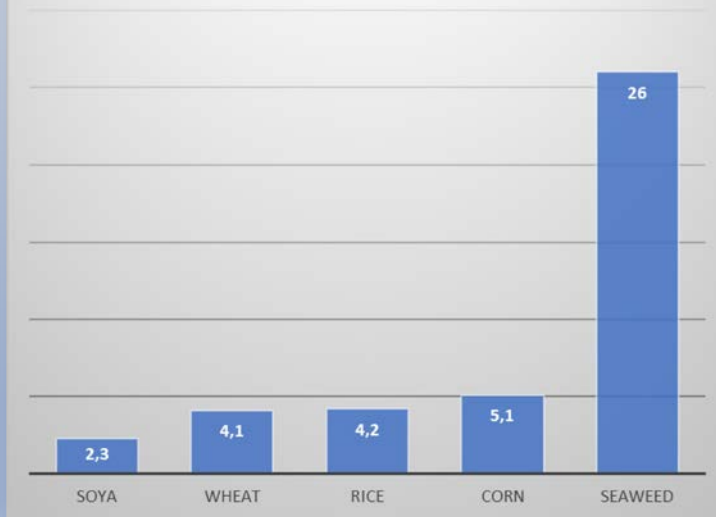


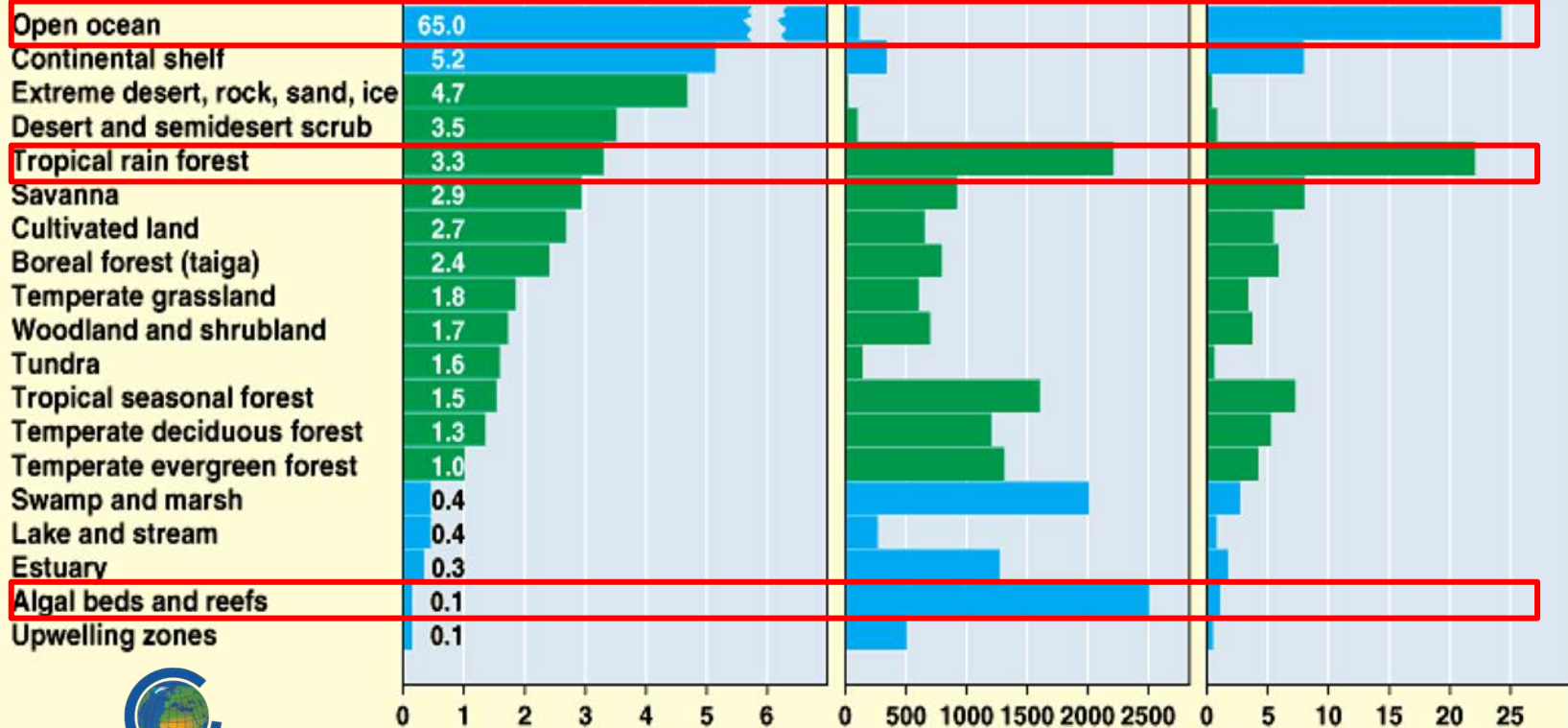
February



20 May

Output per area of various
crops in tonnes/ha





CLIMATE
FOUNDATION

(a) Percentage of Earth's
surface area

(b) Average net primary
production (g/m²/yr)

(c) Percentage of Earth's net
primary production

OCEAN
rainforest

Combating climate change with seaweed cultivation

Converting 9 % of the world's oceans into seaweed farms will:

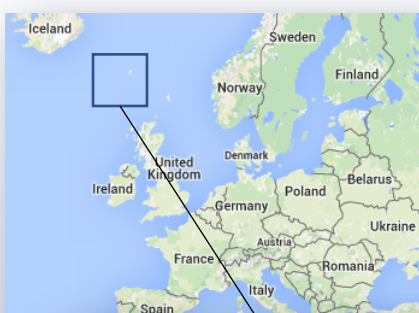
- capture 19 gigatons CO₂ a year which is about **51% of the humanity's net emissions per year** (~37 gigatons).
- help to redress the **acidification** of the oceans and improve conditions for shellfish and invertebrates.
- rapidly attract biodiversity including a large number of fish species and indirect **improve fish stocks**.

"The potential for providing large quantities of food and biomass from macroalgae mariculture is much larger than for any other group of marine organisms."

Source: Science Advice for Policy from European Academies (SAPEA) is a consortium involving more than 100 European science academies, established to provide evidence-based advice to the European Commission on major policy issues. Its first report, "Food from the Oceans", was published at the end of 2016.

Cultivation of seaweed is big in Asia





Our cultivation site

62°18'19.0"N 6°54'29.0"W



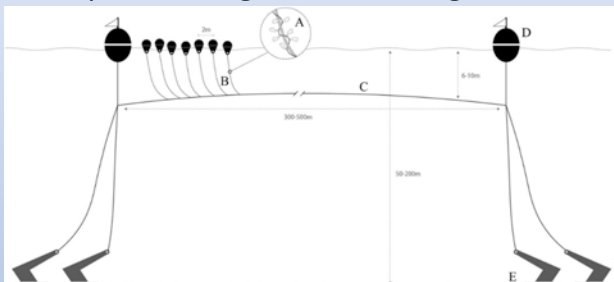
- Water depth:
 - Exposed site: 50-70 meters
 - Moderate exposed site: 15-35 meters
- Water temperature: 7-11 °C
- Salinity: approx. 35 ‰
- Current: 1-3 knots
- Max. wave height: 8 meters
- Max. wind speeds: 62 m/s



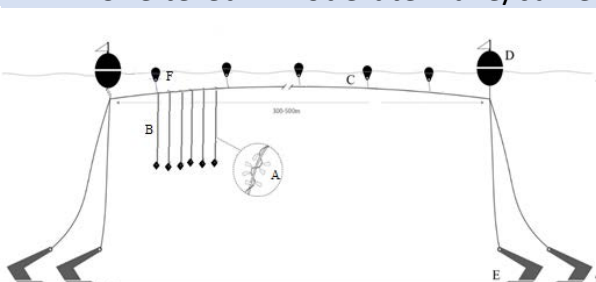
Funningsfjørður, Faroe Islands

Cultivation rig developed by Ocean Rainforest

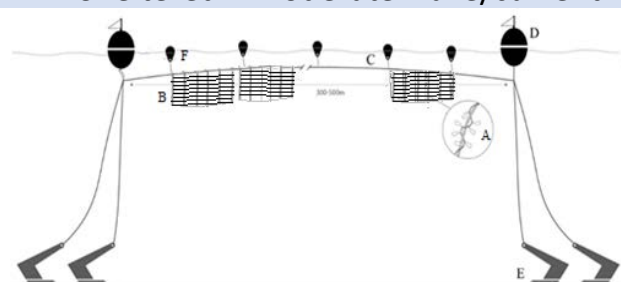
Exposed – high wave/strong current



Sheltered – moderate wave/current



Sheltered – moderate wave/current



Systems and space at sea

- One rig takes up 1 ha (0,02 km²) sea surface (20m x 500m)
- 8 ha (0,16 km²) with a production capacity of 150 tonnes FW

Regrowth with multiple harvest



Why seaweed for food and feed products?

- Natural food additives (alginate, E407-E418)
- Flavour (umami taste)
- Natural pigments (in feed for fish & animals)
- Sodium reduction (major public health issue in US and EU)
- Improve digestion - pre/pro/sym biotic effects – tested in humans and feed (pig, poultry & salmon)
- Essential amino acids and minerals (iodine, B12 vitamins, OMEGA 3 etc.)



Global production of macroalgae & market assessments

The global commercial seaweeds market:
2015: >€10 billion
2024: >€20 billion

Agar, Pharmaceuticals,
Colorants, Global market
size < € 500 million

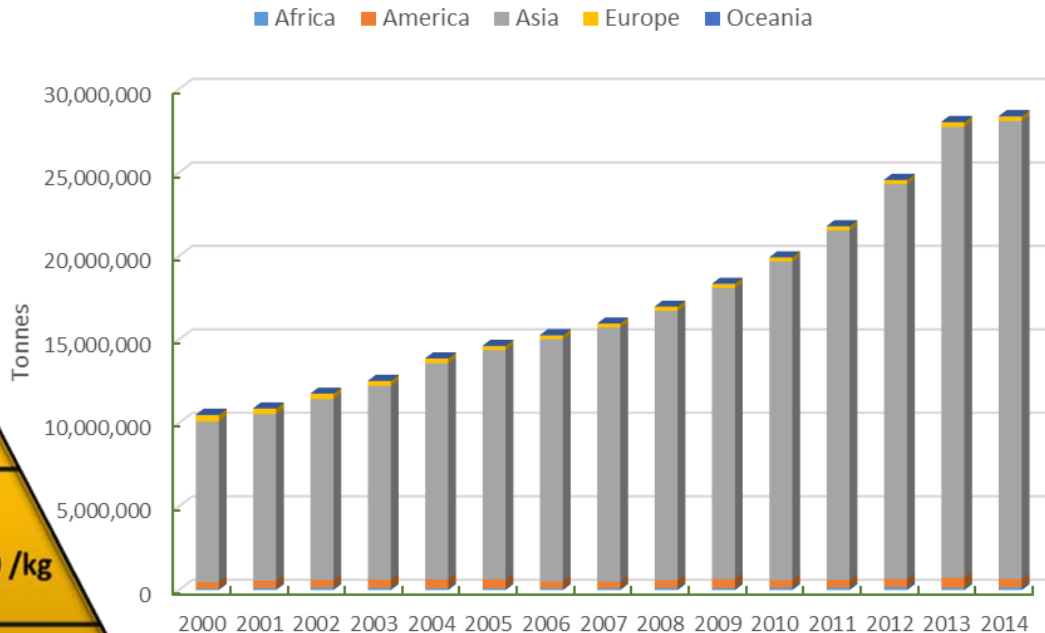
Hydrocolloids, Food and
Feed ingredients, etc. Global
market size ~ € 1 billion

Energy (ethanol, methane),
Fertilizer, Global market
size ~ € 50 billion

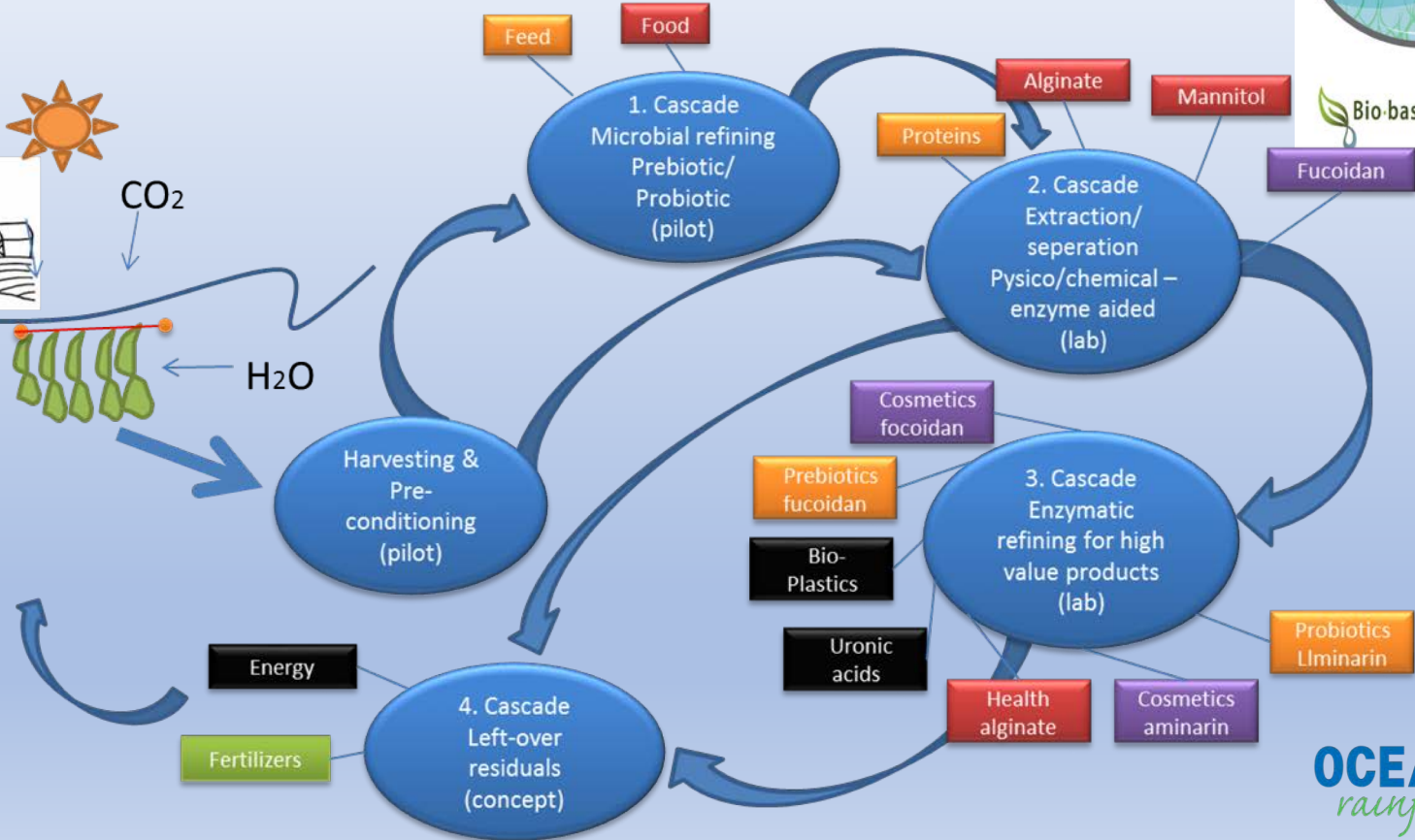
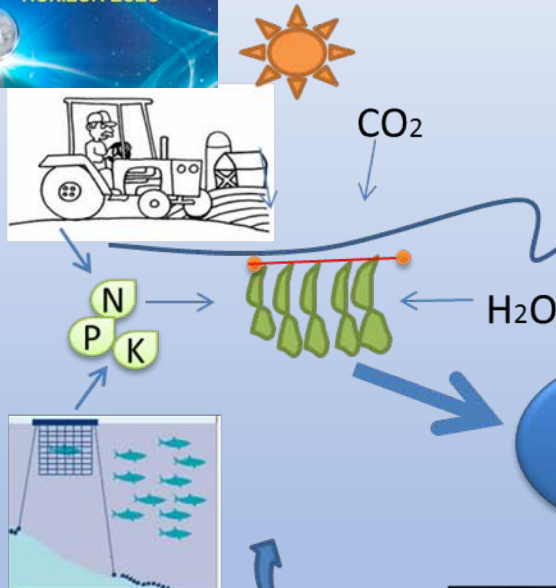
High-Value
Compounds
> € 10 /kg

Mid-Value
Compounds €1- €10 /kg

Low-Value Compounds <€1/kg



The biorefinery approach

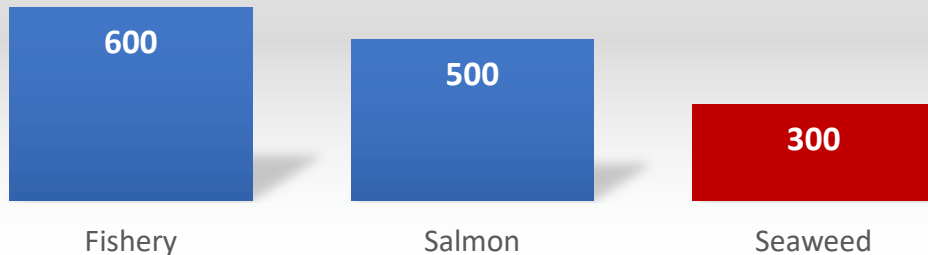


Exclusive Economic Zone Faroe Islands 260.996 km²



Blue Bioeconomy Business Case: Offshore seaweed cultivation in the Faroe Islands

Export value in Million €
based on 2016
incl. blue bioeconomy
(seaweed)



Salmon production	70.000 tonnes in 2016
Nitrogen Phosphor	3500 tonnes 700 tonnes
4 kg N pr 1000 kg, ww seaweed	1 mio. Tonnes ww
Total emission of CO ² in the Faroes	870.000 tonnes in 2016
3 kg ww seaweed/1 kg CO ²	3 Mio. Tonnes ww seaweed
MACR: 5000 tonnes ww/km ²	600 km ² or 0.2% of EEZ
CAPEX: €800M Depreciation & interests: €100/year	240.000 tonnes tonnes dw storage stable intermediates/y
Average price €1000/t dw = €300M / year	40% OPEX €80M profit /year



QUESTIONS? EMAIL US:

HELLO@LOLIWARE.COM

LOLIWARE™

LOGIN 0 ITEMS

1,5-2 Million tons of seaweed
50.000 tons of alginate
LOLIWARE LEAVES NOTHING BEHIND.

[ABOUT](#) [LIFE WILD](#) [CONTACT](#)



OUR PRODUCT

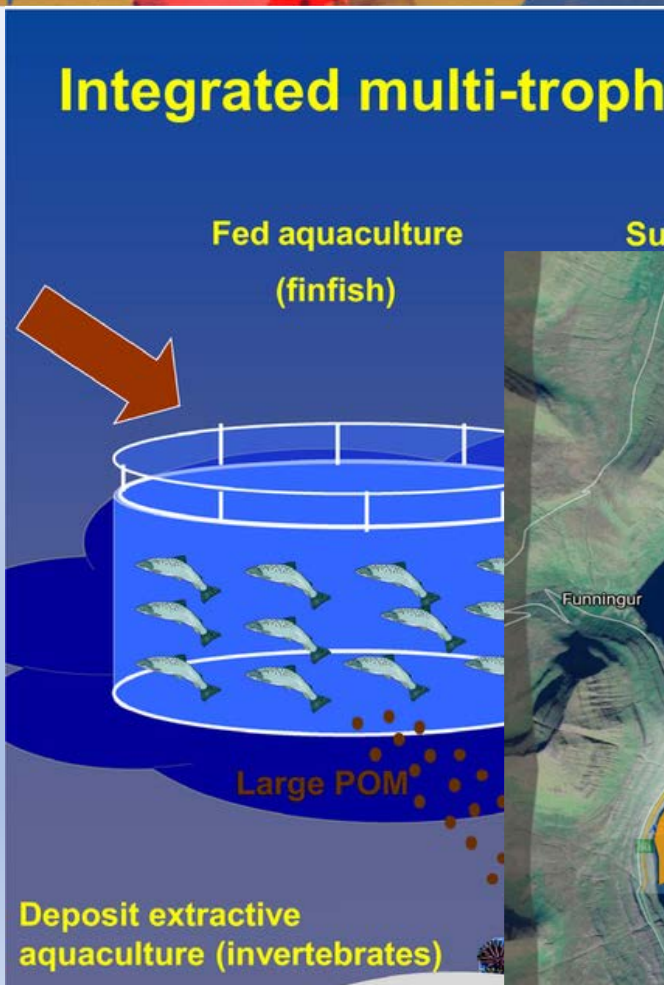
LOLIWARE started with the first and only edible disposable cup. We provided a completely new experience, 100% plastic-free, gluten-free, gelatin-free, BPA-free, non-GMO, all natural, non-toxic, safe, and FDA approved, LOLIWARE Cups and Straws. Our products are made from a biodegradable material so natural you can eat it.

LOLIWARE is made from seaweed, organic sweeteners and flavors and colors derived from fruits and vegetables. Serve room temperature, chilled, or frozen drinks and desserts.

LOLIWARE can be found at the Four Seasons Hotel, or through Aramark, caterers and

Integrated multi-trophic aquaculture (IMTA) systems, using an integrated coastal area management (ICAM) strategy.

(T. Chopin)



The most disruptive trends in the sector

- Appreciation of the healthy, nutritional & environmental functions
- Develop seaweed based products and markets
- Demonstrate integrated processes at large scale
- Develop appropriate regulations to allow the sector to grow



Thank you!



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