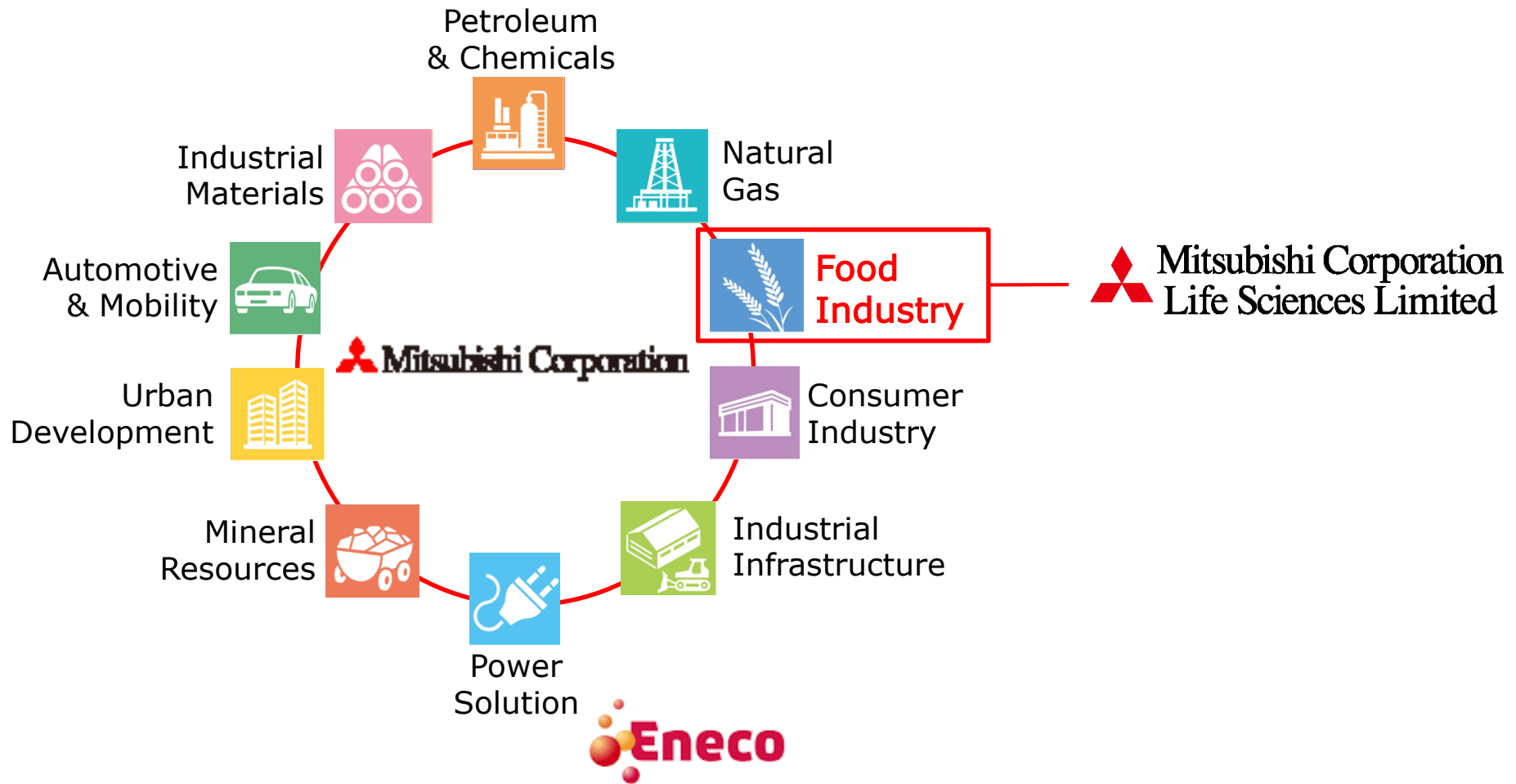
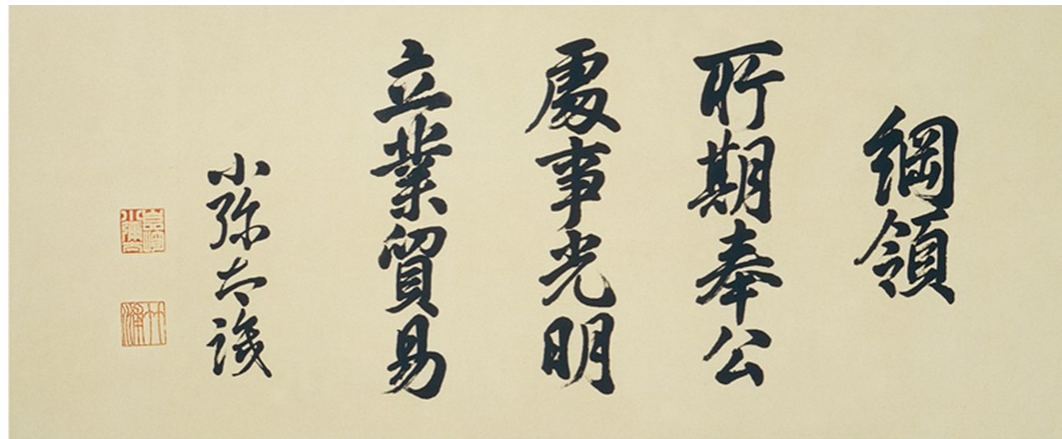


Seaweed and protein transition / Food

Perspective from the food
industry



The Three Corporate Principles (三綱領 “Sankoryo”)



「所期奉公」 “Shoki Hoko” Corporate Responsibility to Society

Strive to enrich society, both materially and spiritually, while contributing towards the preservation of the global environment.

「處事光明」 “Shoji Komei” Integrity and Fairness

Maintain principles of transparency and openness, conducting business with integrity and fairness.

「立業貿易」 “Ritsugyo Boeki” Global Understanding Through Business

Expand business, based on an all-encompassing global perspective.

- ✓ Based on UN's Sustainable Development Goals
- ✓ Shift to sustainable power source (**energy transition**)
- ✓ Valorizing side streams
- ✓ Collaboration with our group companies and external companies
- ✓ Participation on co-creative ecosystem
- ✓ Investments in the **protein transition**



Japanese Dashi:
Bonito (fish) and
Konbu (seaweed)



Fresh seaweed
department
supermarket
Japan

Wakame



Konbu



Ingredients from seaweed:

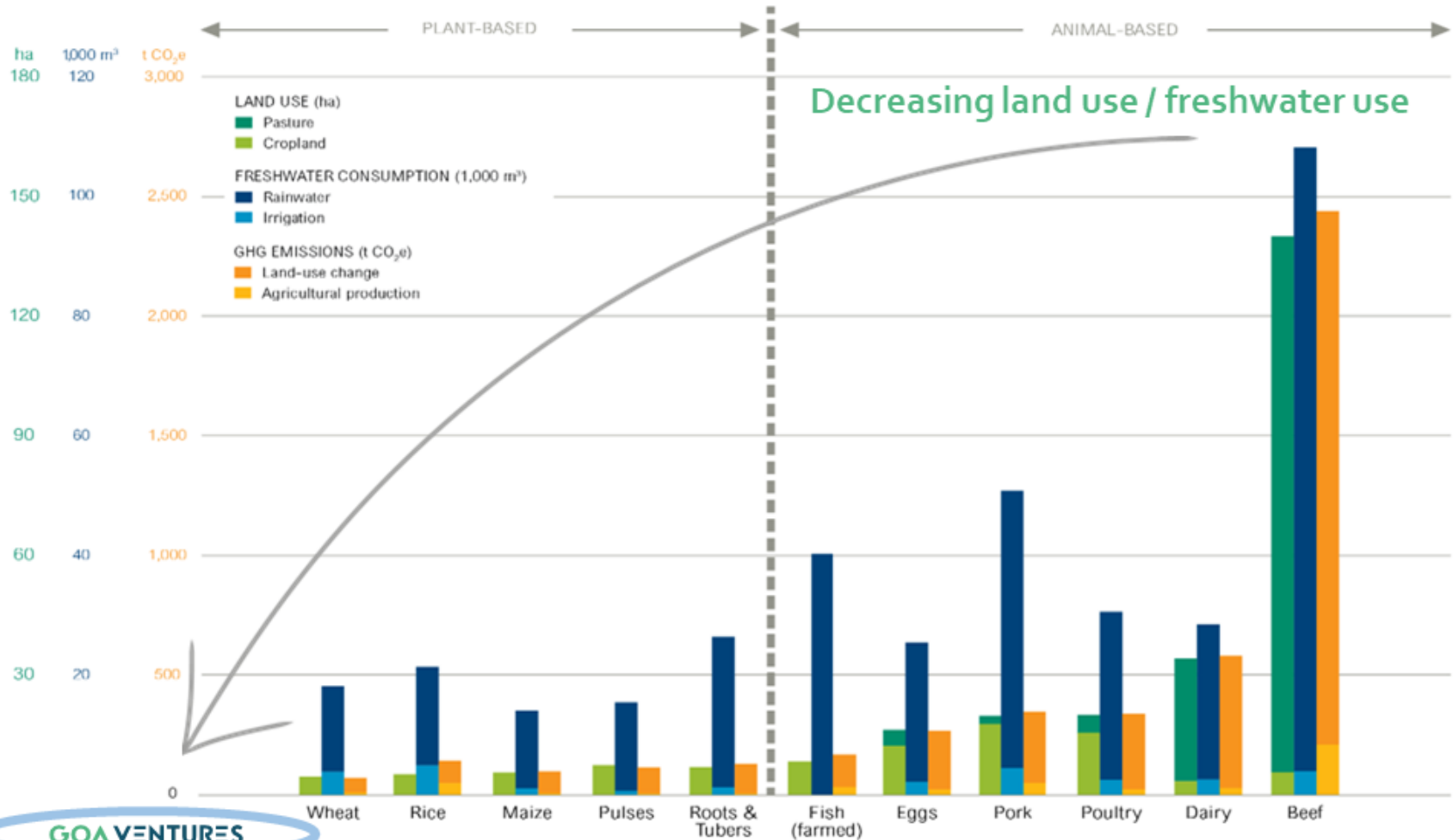
- Carrageenan: polysaccharides for gelling, thickening, stabilizing
- Alginate: gum, sausage casing

Nori



The protein transition

PER TON PROTEIN CONSUMED



GOA VENTURES

wri.org/shiftingdiets

WORLD RESOURCES INSTITUTE

- ✓ Soy: how sustainable?
- ✓ Wheat: gluten issue
- ✓ Pea
- ✓ Lupine
- ✓ Mycoprotein
- ✓ (Insects)
- ✓ Fava beans: off taste
- ✓ Quinoa: bitter



Globally, consumers and the food industry are looking for new protein sources which are healthier, tastier, cheaper and/or more sustainable.

Seaweed can be one of these new protein sources depending on taste, price, nutritional values, digestibility and constant quality.

But probably seaweed has functionalities that are more valuable than just being a protein source.

- Gelation, foaming, binding: to replace egg white?
- Emulsification: to replace egg yolk?
- Taste

Potential applications:

- Meat-, fish-, egg-, dairy alternatives as protein source and/or binder
- Sauces
- Bakery
- Etc



Seaweed protein seems to be a very interesting ingredient, next to carrageenan, alginate, etc. MCLS is committed to evaluate and test upcoming seaweed protein samples to find the highest added value