

Havet og akvatisk mat i et lavutslippssamfunn

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Lavutslipp, klima, energi, natur, vann, mat...

«And we must remember that without Montreal there will be no Paris, because we need to protect biodiversity to achieve our climate targets.»

Virginijus Sinkevičius - EU Commissioner for the Environment, Oceans and Fisheries



Men det blir verken biologisk mangfold, naturbaserte klimaløsninger, energisikkerhet eller geopolitisk stabilitet uten global matsikkerhet!

«Akvatisk mat står sentralt for framtidig matsikkerheit»



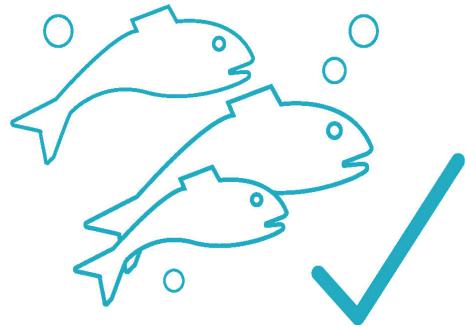
Utenriksdepartementet

Strategi

Kraftsamling mot svolt
– ein politikk for auka
sjølvforsyning

Noregs strategi for matsikkerheit i utviklingspolitikken

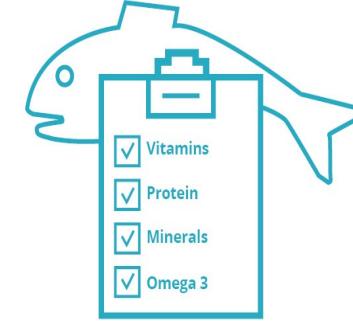
Handlingsnettverk for bærekraftig mat fra hav og ferskvann for matsikkerhet og ernæring



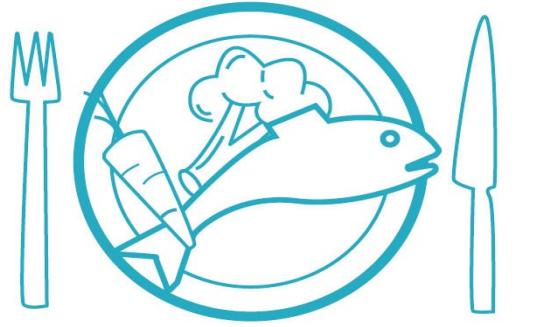
Sufficient Aquatic Food



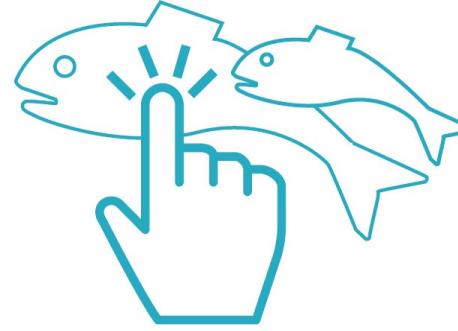
Safe aquatic food



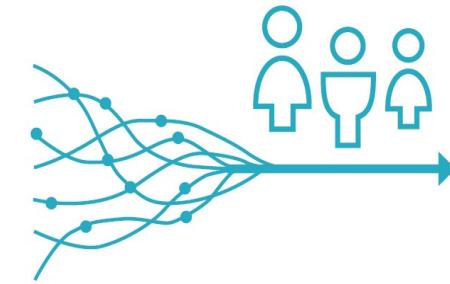
Nutritious aquatic food



Dietary needs



Food preference



Leaving no one behind

<https://nettsteder.regjeringen.no/foodfromtheocean/>

Hav-baserte klimaløsninger Redusert CO₂-utslipp i 2050

International Shipping
0.75-1.5 GtCO₂e



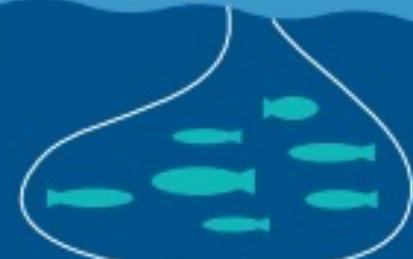
Domestic Shipping
0.15-0.3 GtCO₂e



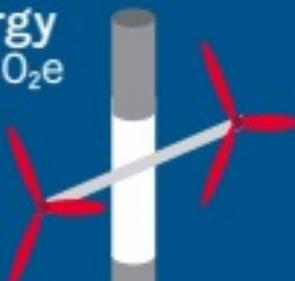
Aquaculture
0.0-0.04 GtCO₂e



Offshore Wind
0.65-3.50 GtCO₂e



Ocean Energy
0.11-1.90 GtCO₂e



Wild Capture Fisheries
0-0.14 GtCO₂e



Seaweed Farming
0.05-0.29 GtCO₂e



Mangroves
0.10-0.29 GtCO₂e



Dietary Shifts
0.3-1.06 GtCO₂e



Salt Marshes
0.05-0.10 GtCO₂e

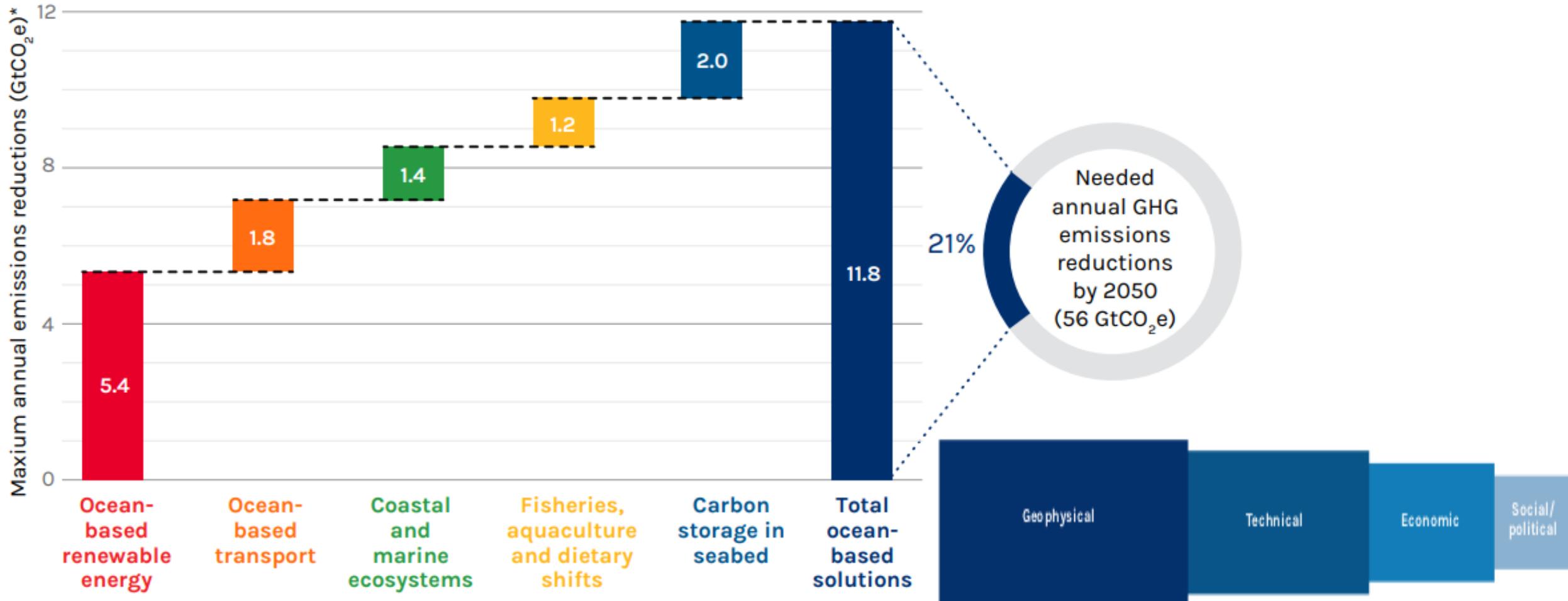


Seagrasses 0.05-0.22 GtCO₂e

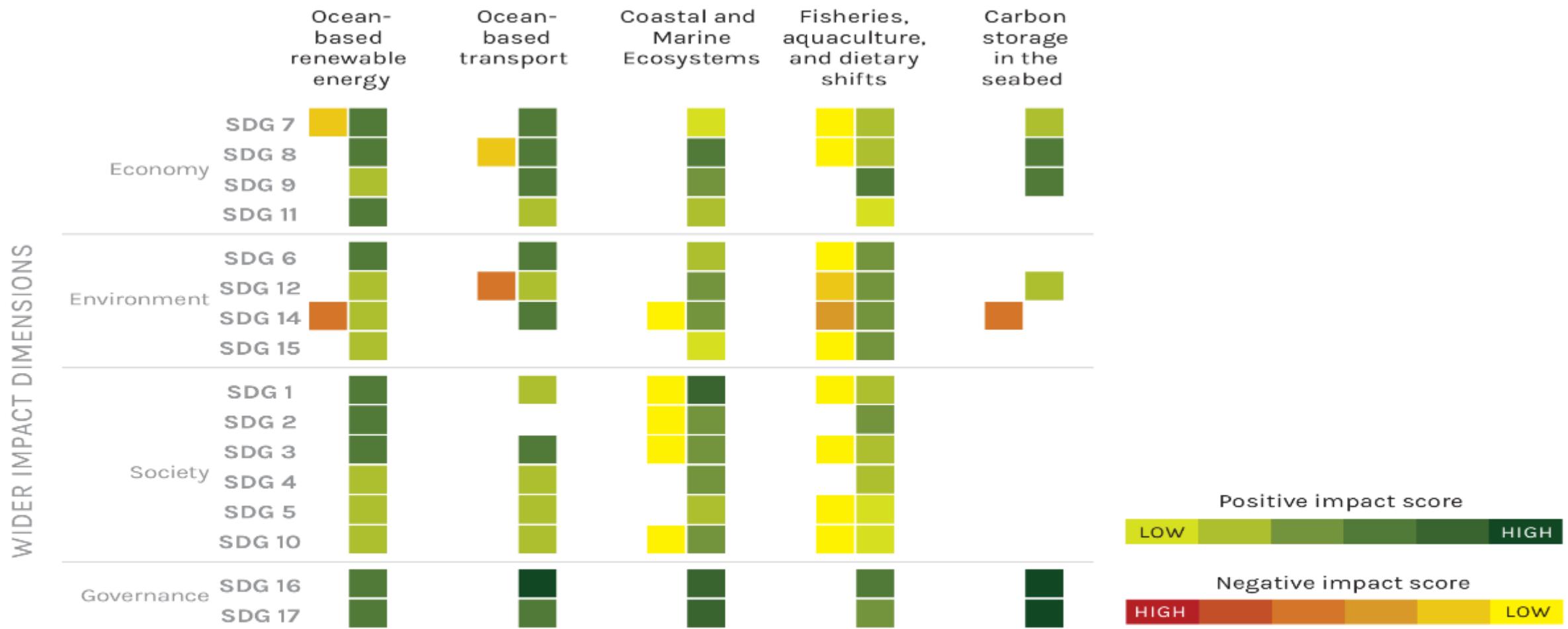


Seabed Storage of Carbon
0.5-2.0 GtCO₂e

Potential contribution of five areas of ocean-based action to mitigating climate change in 2050 (maximum GtCO₂e)



Ocean-based climate mitigation options have more co-benefits than trade-offs, and will support the achievement of the SDGs



List of Sustainable Development Goals reviewed:



Source: Authors

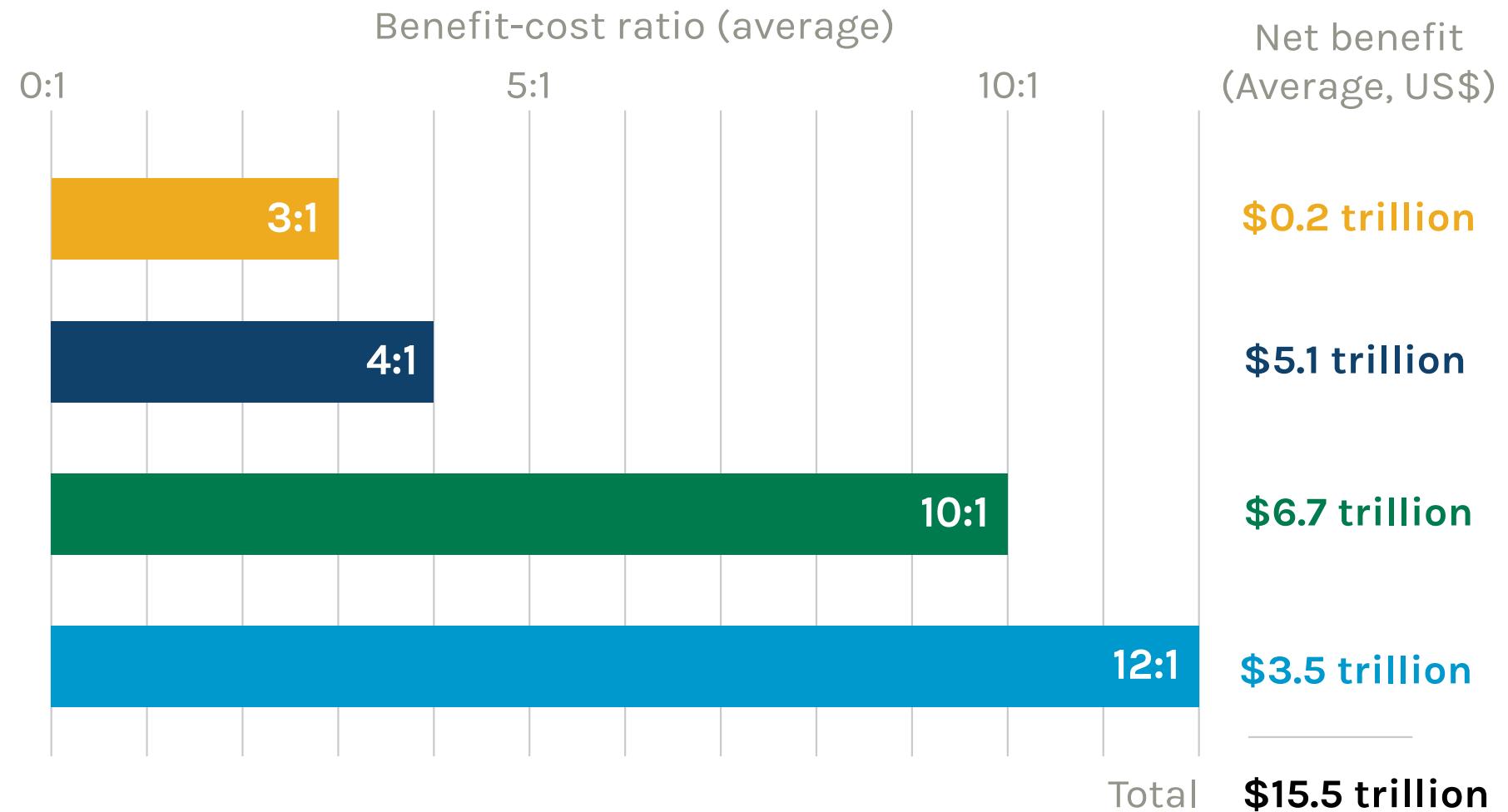


Conservation and restoration of mangroves

Decarbonisation of international shipping

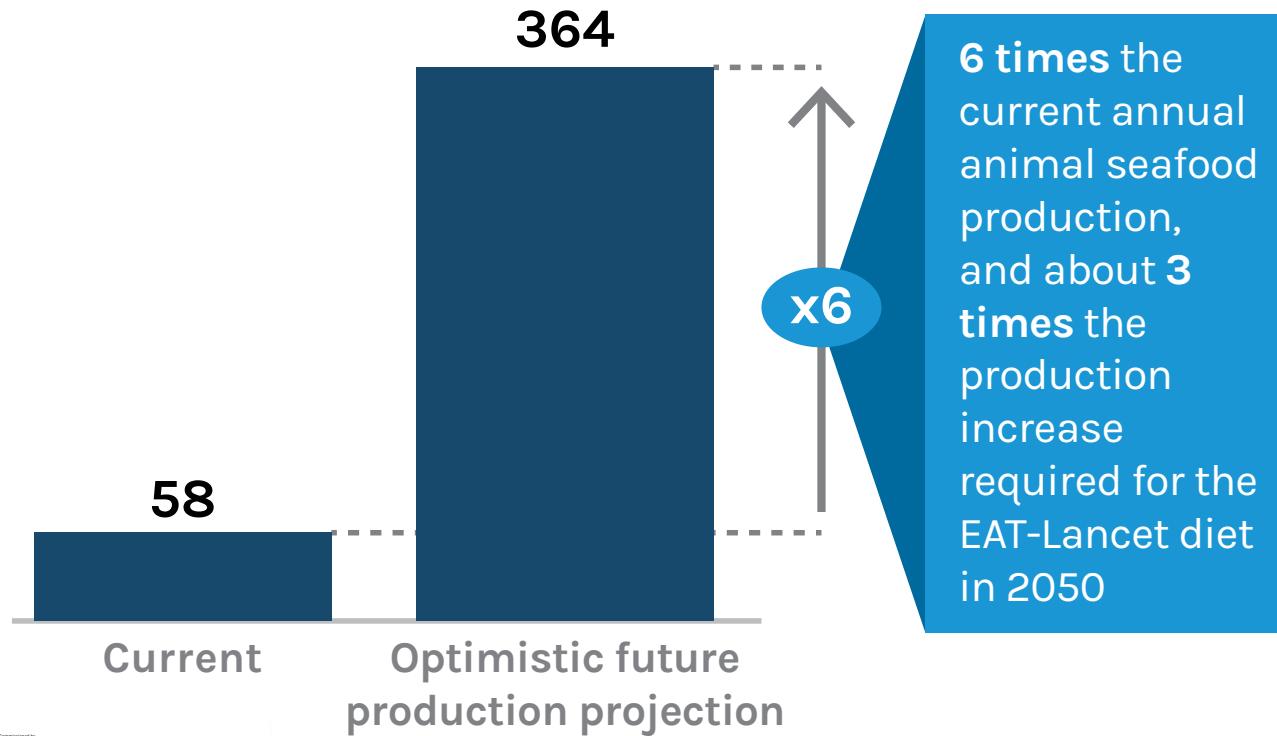
Ocean-based food production

Offshore wind energy production



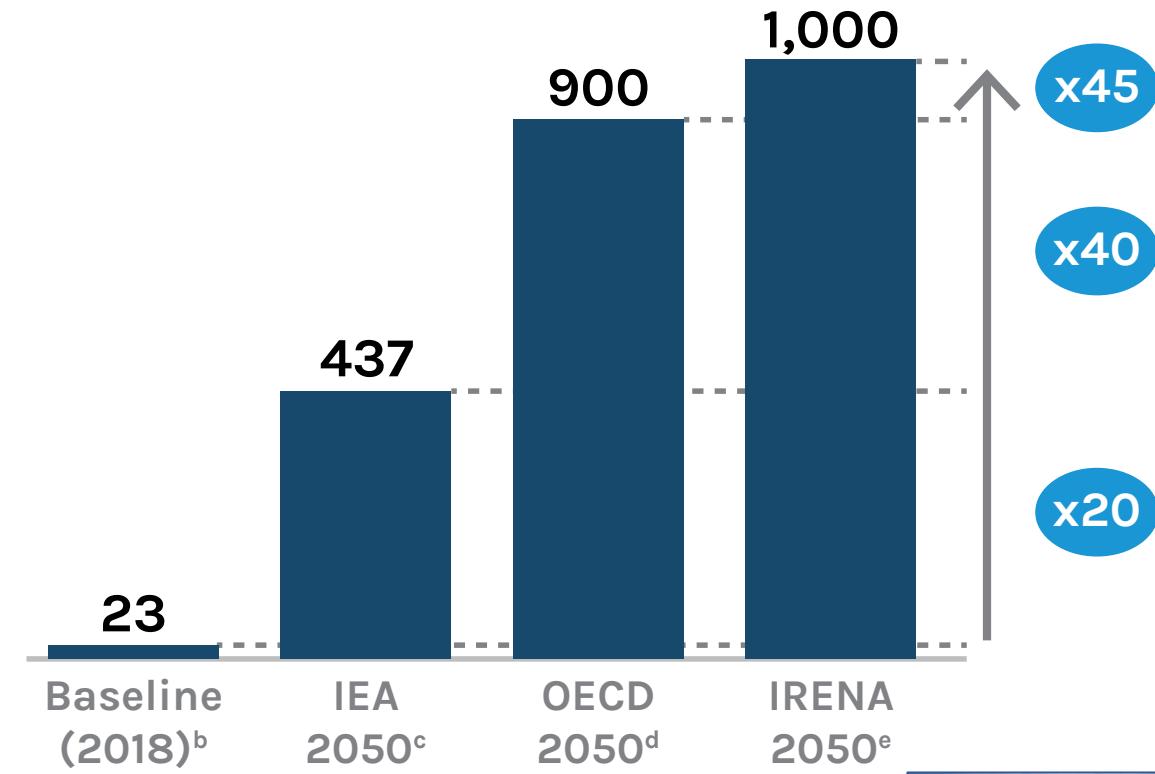
Ikke noen fasit, men heller ikke tatt ut av luften. Slike investeringer lønner seg.

A) Potential additional ocean food production under sustainable practices – in edible weight
(at a price of USE 5,500 per MT, graph in MMT/yr.)^a



Costello et al., 2019

B) Potential capacity increase in offshore wind GW, global



Stuchey et al., 2020



Ikke bare mat-mengde/proteiner og bærekraftsdimensjoner, også andre næringsstoffer!

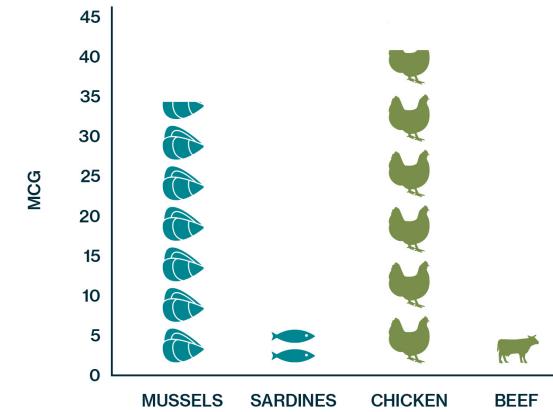
Nutrient Diversity of Blue Foods

Data obtained from:

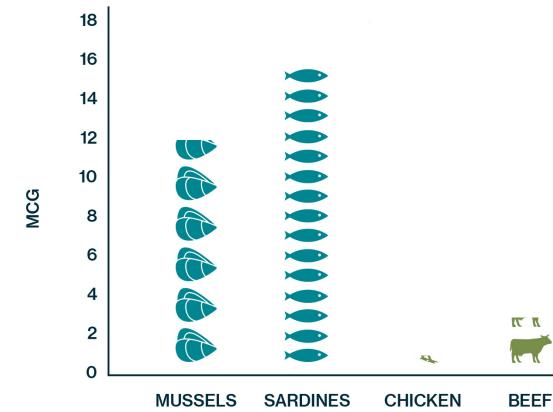
- Golden, C.D., Koehn, J.Z., Shepon, A. et al. Aquatic foods to nourish nations. *Nature* 59-8, 315–320 (2021). <https://doi.org/10.1038/s41586-021-03917-1>
- Golden, Christopher D.; Koehn, J. Zachary; Vaitla, Bapu; DeSisto, Camille; Kelahan, Heather; Manning, Kayla; Fiorella, Kathryn J.; Kjellevold, Marian; Thilsted, Shakuntala H., 2021, "Aquatic Food Composition Database", <https://doi.org/10.7910/DVN/KI0NYM>, Harvard DataVerse, V3.

This graphic was developed as part of the Blue Food Assessment.

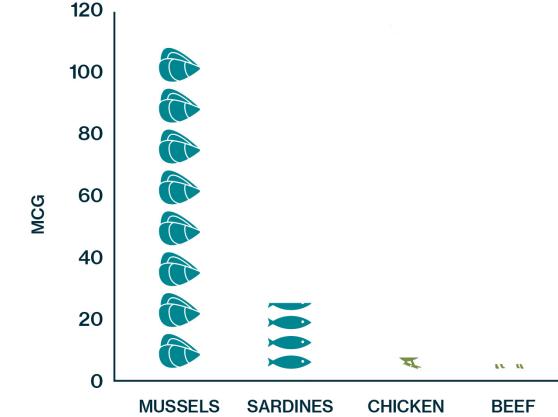
VITAMIN A (mcg per 100g serving)



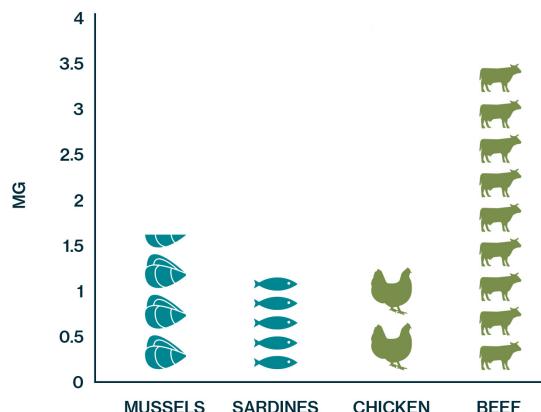
VITAMIN B12 (mcg per 100g serving)



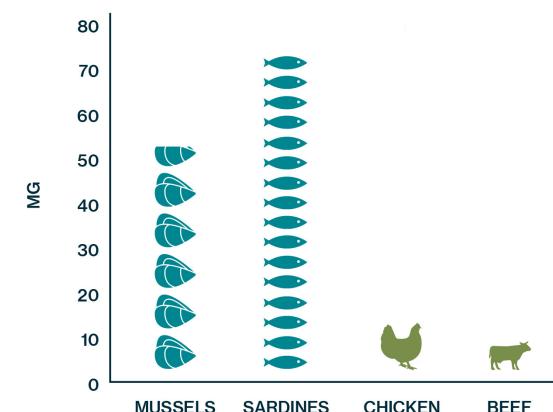
IODINE (mcg per 100g serving)



ZINC (mg per 100g serving)

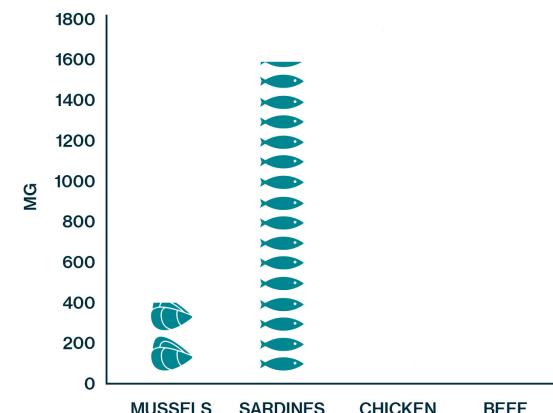


CALCIUM (mg per 100g serving)

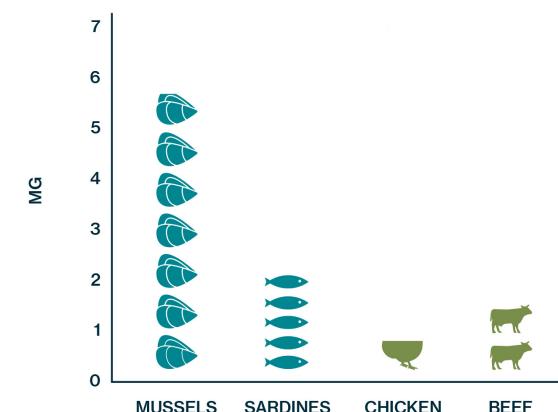


OMEGA-3 FATTY ACIDS

(mg per 100g serving, EPA and DHA only)



IRON (mg per 100g serving)

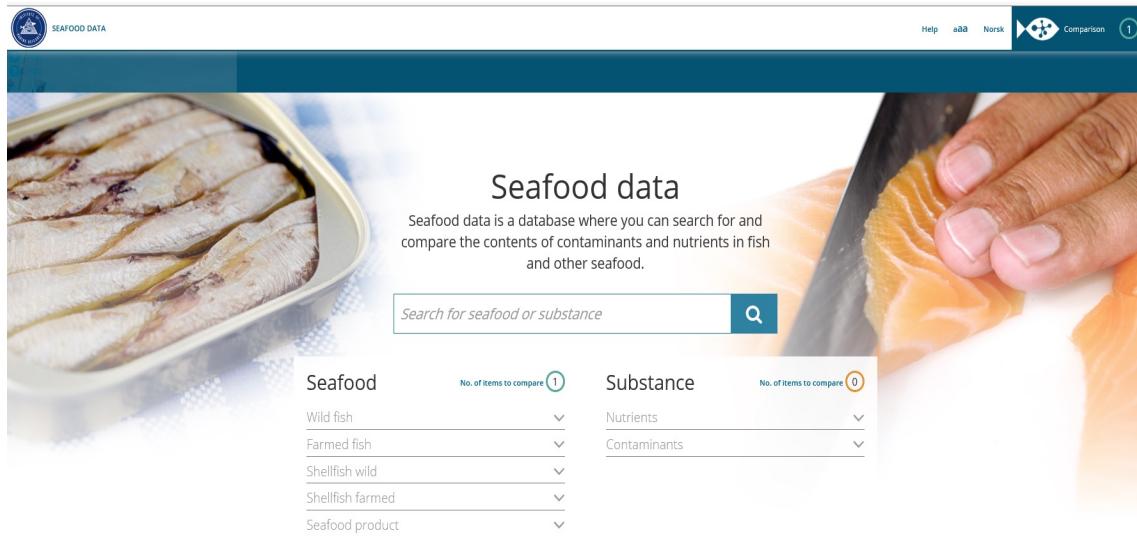


Sjømatens rolle i mattrygghets- og ernæringsperspektiv

Flere land opplever store andeler stunting hos barn; disse er kognitivt svekket, noe som kunne vært unngått ved riktig ernæring (f eks jod, vitamin A, B12 og flere mikronæringsstoffer som fisk er rik på, men vi vet ikke hvilke arter og hvor mye det finnes av næringsstoffene der).

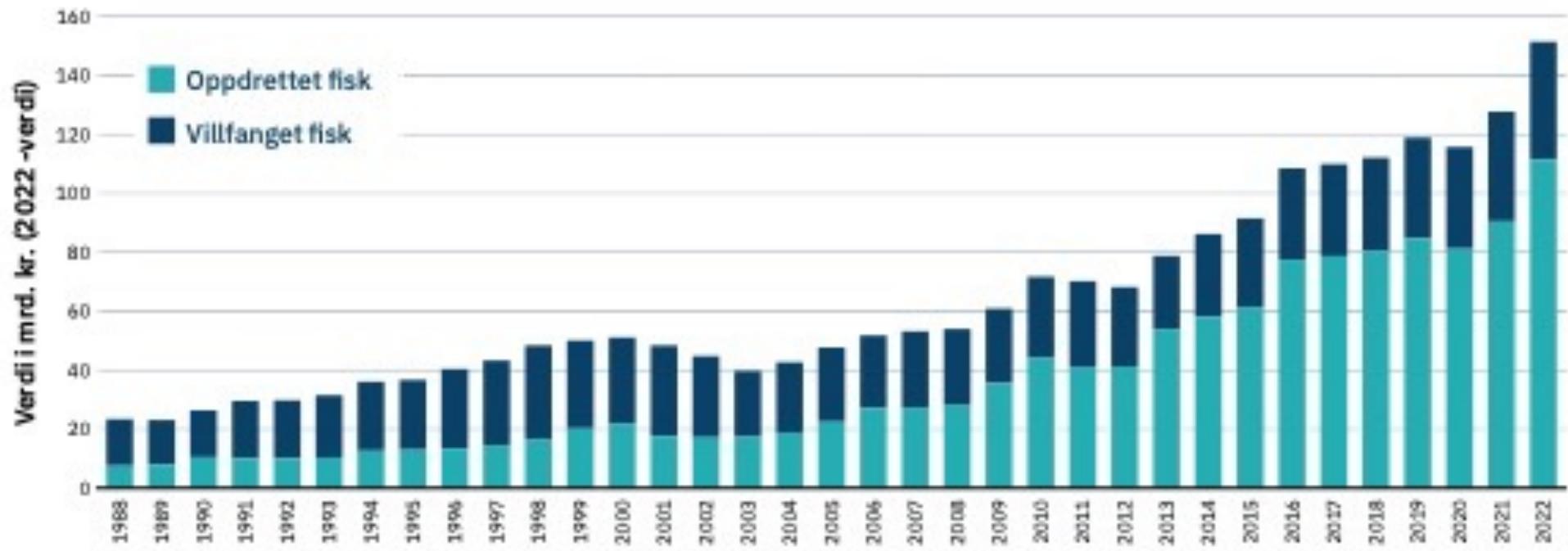
INFOODS dekker stort sett energi- protein, og noe på vitamin A, men kunnskapen er mangefull; dette vil ha betydning for hvordan landene prioriterer å bruke sin fisk (for helse eller eksport?).

Mangel på data om innhold av næringsstoffer og fremmedstoffer internasjonalt.



Annerledeslandet Norge

- Både fiskeri og akvakultur er lønnsomt i Norge, viktig for eksport og handelsbalanse
- Vi produserer 737 kg sjømat vs 66 kg kjøtt per person i 2020
- Verdens nest største eksportør av akvatisk mat bare slått av Kina
- Vi produserer ca 2% av global akvakultur og 2% av villfanget fisk med < 0,1% av befolkning
- Norge: Akvakultur av marin fisk, Verden: Vekst i Asia og i ferskvann, akvakultur av planter

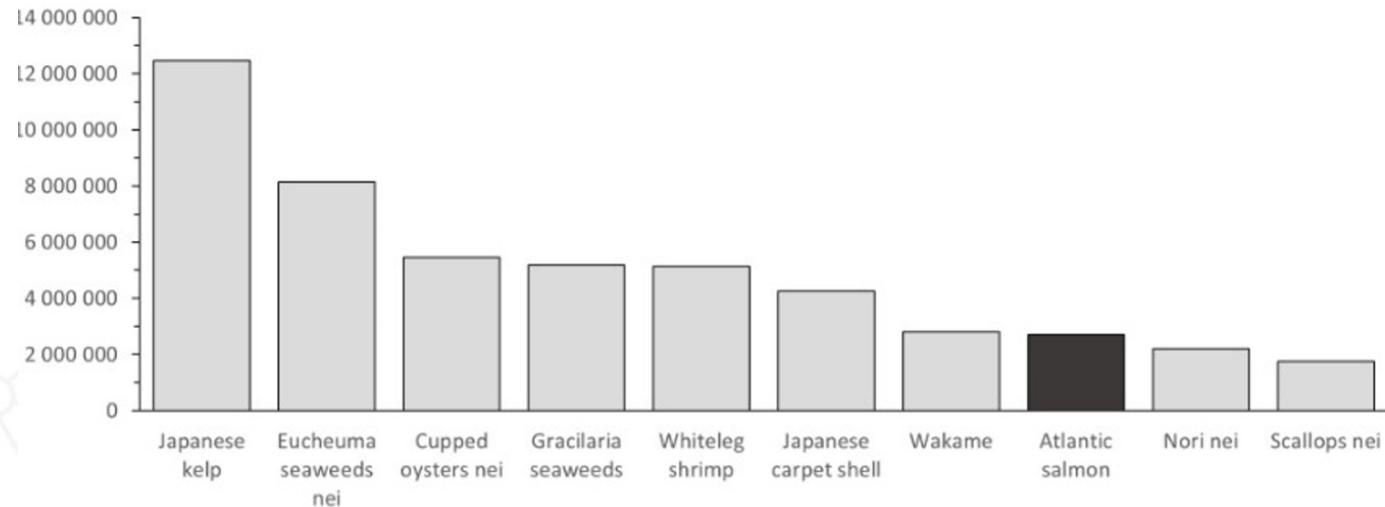


Figur 2: Norsk eksport av sjømat 1988–2022. Kilde: Norges Sjømatråd

Global akvakulturproduksjon

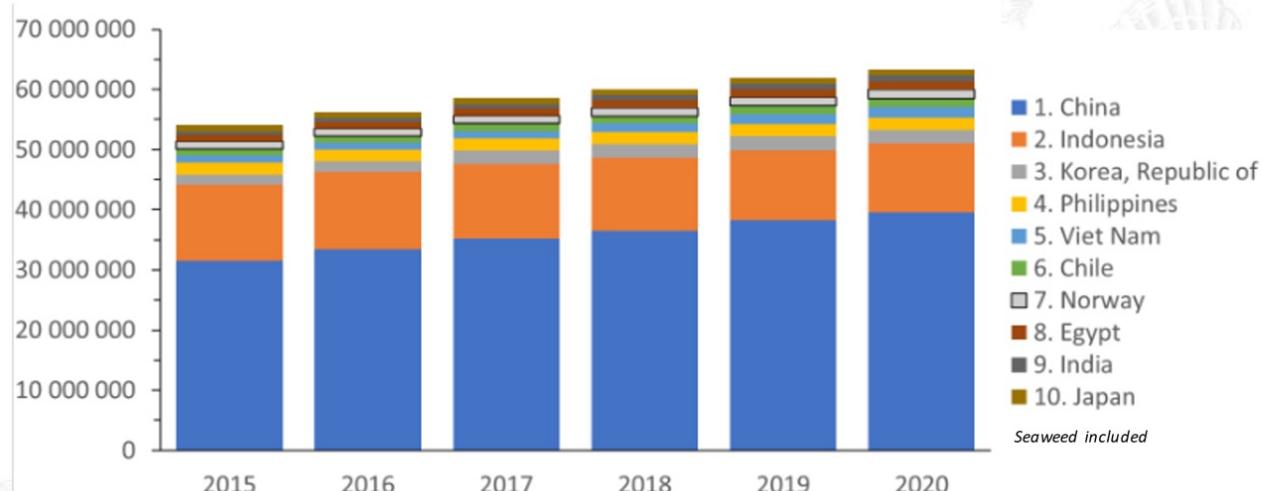
- Atlantisk laks eneste fisk blant topp 10
- Norge 7. største land

Top 10 species in 2020



Top 10 countries in 2020

(69,1 million tonnes)

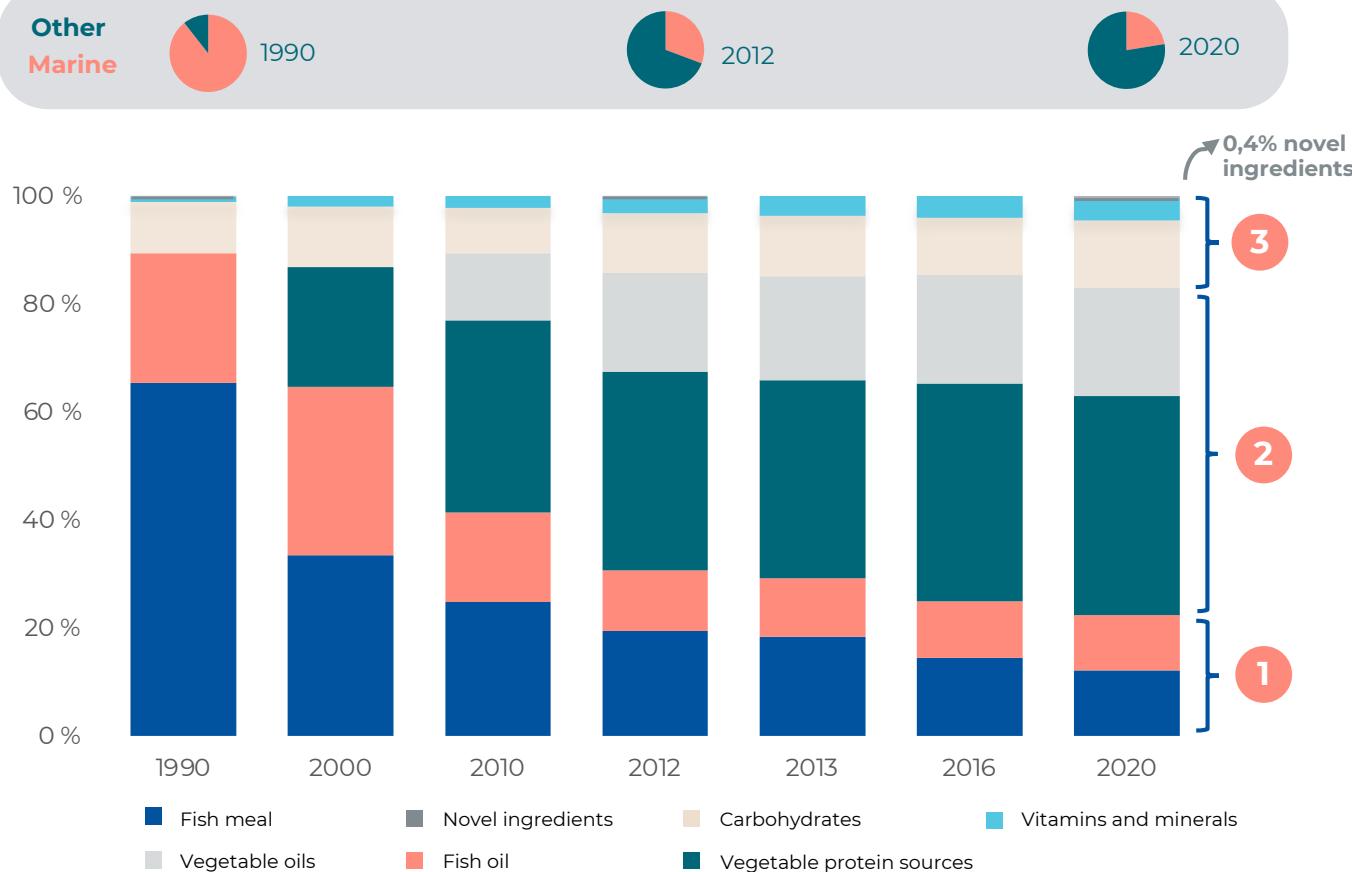


70-90% av klimafotavtrykk
for norsk lakseoppdrett er
knyttet til fôr, ref nasjonale
mål om bærekraftig fôr.

Increase in novel feed raw materials necessary for growth

Today's feed mainly consists of land-based sources, with soy being the dominant ingredient source. Only 0.4% are novel ingredients.¹⁵

Ingredients used in Norwegian salmon feed
(% of total ingredients)



1 Marine ingredients at record low levels in 2020

- The dominant protein and oil source for fish feed in 1990 (~90%)
- Reached a record low share in 2020, with approximately 22% of total feed ingredients

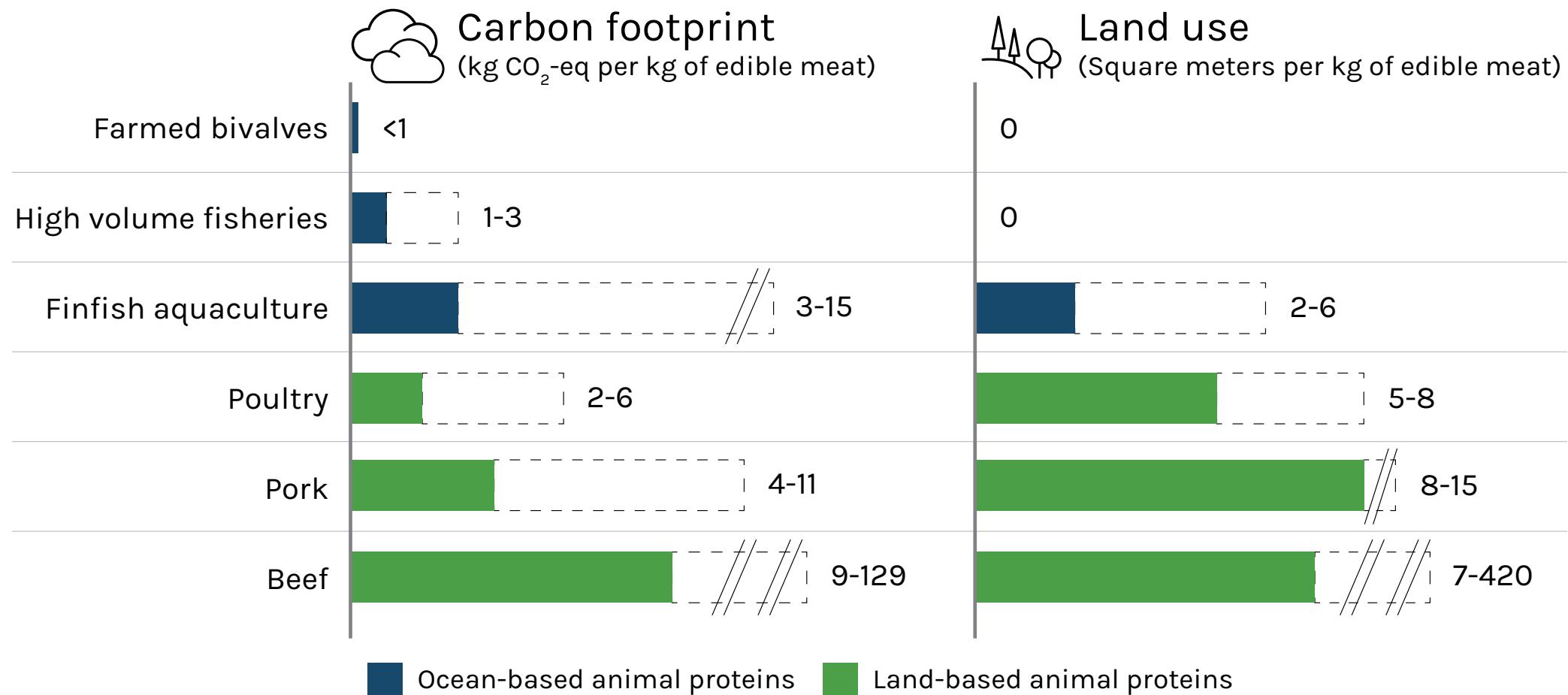
2 Plant-based ingredients the dominant source in fish feed

- Plant-based protein and oil accounted for more than 60% of total feed ingredients in 2020
- Soy the dominant protein source with nearly 21% of ingredients share total
- Canola oil the dominant oil source with 18% of ingredients share total

3 Novel ingredients a small fraction of total feed volumes

- Novel ingredients (insect meal, single cell proteins, microalgae, etc.) accounted for 0.4% (8 130 tonnes) of total ingredients in 2020
- Carbohydrates stable in recent years, 12.5% in 2020
- Micro ingredients (vitamins, minerals, amino acids, etc.) stable around 4%

Forenklet oversikt over fotavtrykk

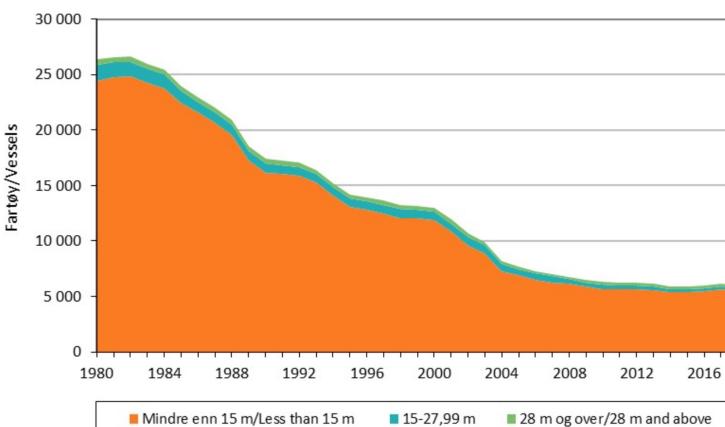


Småskalafiske:

- Utbredt i tropene
- Utsatt for klimaendringer
- Ofte næringsrik fisk
- Til lokalt konsum
- Konkurrerer noen steder med industrifiske til for

Norsk småskala kystfiske:

- Kan bidra til selvforsyning
- 10% av mengde, 18% verdi



Key findings from the Illuminating Hidden Harvests report

This brief presents the main results from the Illuminating Hidden Harvests (IHH) report, providing new, clearer insights to support the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication ([SSF Guidelines](#)) and progress toward the Sustainable Development Goals ([SDGs](#)).



Small-scale fisheries account for at least **40 percent of global fisheries catch**.



90 percent of the people employed along capture fisheries value chains operate in small-scale fisheries.



45 million women participate in small-scale fisheries, including for subsistence.



492 million people depend at least partially on small-scale fisheries for their livelihoods.



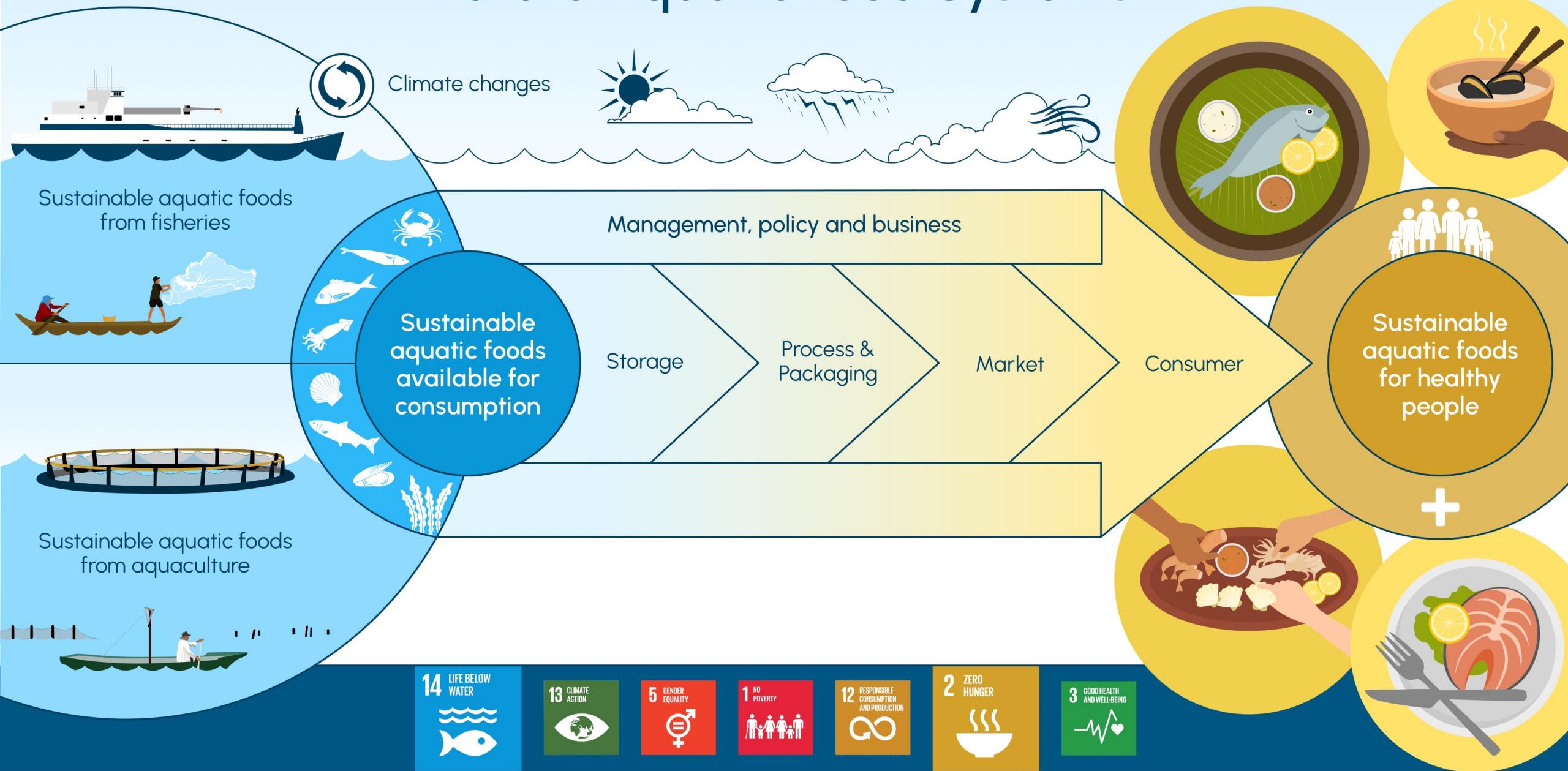
Small fish and midwater fish are especially nutritious and found abundantly in small-scale fisheries landings.



Co-management is likely implemented for about **20 percent of the catch** from small-scale fisheries.

FAO, Duke University & WorldFish. 2023.
Illuminating Hidden Harvests – The contributions of small-scale fisheries to sustainable development. Rome. <https://doi.org/10.4060/c4576en>

Achieving the Sustainable Development Goals (SDGs) through Future Aquatic Food Systems





BÆREKRAFT: Klima og miljøminister Espen Barth Eide (Ap) og fiskeriminister Bjørnar Skjærån (Ap) lanserte nyheten om at Norge får en ny havmiljølov på en båttur i Lisboa i Portugal. Foto: Santiago Vergara S.

Regjeringen: Norge får ny havmiljølov

FNs havkonferanse: Handlingsnettverk mot 2030

Framtidsperspektiver

- Norsk lavutslipp i global naturvennlig LED-økonomi
- Havnæringer og akvatisk mat er klimaløsninger
- Norske aktører innen fiskeri og akvakultur er der for å tjene penger, ikke for å bidra til lavutslipp, folkehelse eller bærekraft.
- Utnyttede muligheter:
 - Nye arter i akvakultur
 - Skjell og planter til mat og fôr
 - Fiskeslam til gjødsel? ...

Spis blåskjell!!!

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Havforskningsinstituttet

Råd til myndighetene, forskning, datainnsamling.



Økosystemer og påvirkning

Bærekraftig fiske

Bærekraftig akvakultur

Trygg og sunn sjømat

