

Marine Permaculture:

Regenerative aquaculture as a bioremediation and social innovation tool

THEME: **Aquaculture**

Agenda

- **13:30 Welcome & introductions: *A broad introduction to permaculture as a concept***
 - Frederick Bruce, **s.Pro / Submariner Network** (supported by Maria-Jose de la Peña)
- **13:45 Keynote Presentation – *Exploring Marine Permaculture deep water irrigation for food-secure European production***
 - Brian von Herzen, **Climate Foundation** PRE-RECORDED VIDEO (questions answered by Nina Schlaepfer)
 - Q&A
- **14:10 Presentation 2 – *BLUE4ALL & OCEANCITIZEN projects***
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 - Joachim Hjerl, **Havhøst**
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- **14:50 Feedback & Discussion**
 - *Participants give feedback on the manifesto*
- **15:05 Wrap up & conclusions: *What is permaculture and can it help us in Mission:Ocean?***

Mission:Ocean Regional Deployment Roadmaps

- Are activities in NO/SE/DK/DE until 2026 **aligned** with Mission:Ocean objectives?
 - Restore biodiversity
 - Eliminate pollution
 - Carbon-neutral & circular economy
- 1. *What **targets** should we set in those countries?*
- 2. *What **actions** do we need to achieve those targets?*

Goals for this session

- *What is marine permaculture?*
- *Can it help us to achieve the Mission:Ocean objectives in NO/SE/DK/DE by 2030?*
- *Feedback on the COOL BLUE / Havhøst Manifesto*

Permaculture Design Certificate





Nature is our greatest weapon of mass regeneration!

Reefs made from trees could help restore biodiversity, study finds

Researchers say their pyramid-shaped pear tree structures could help certain marine habitats recover

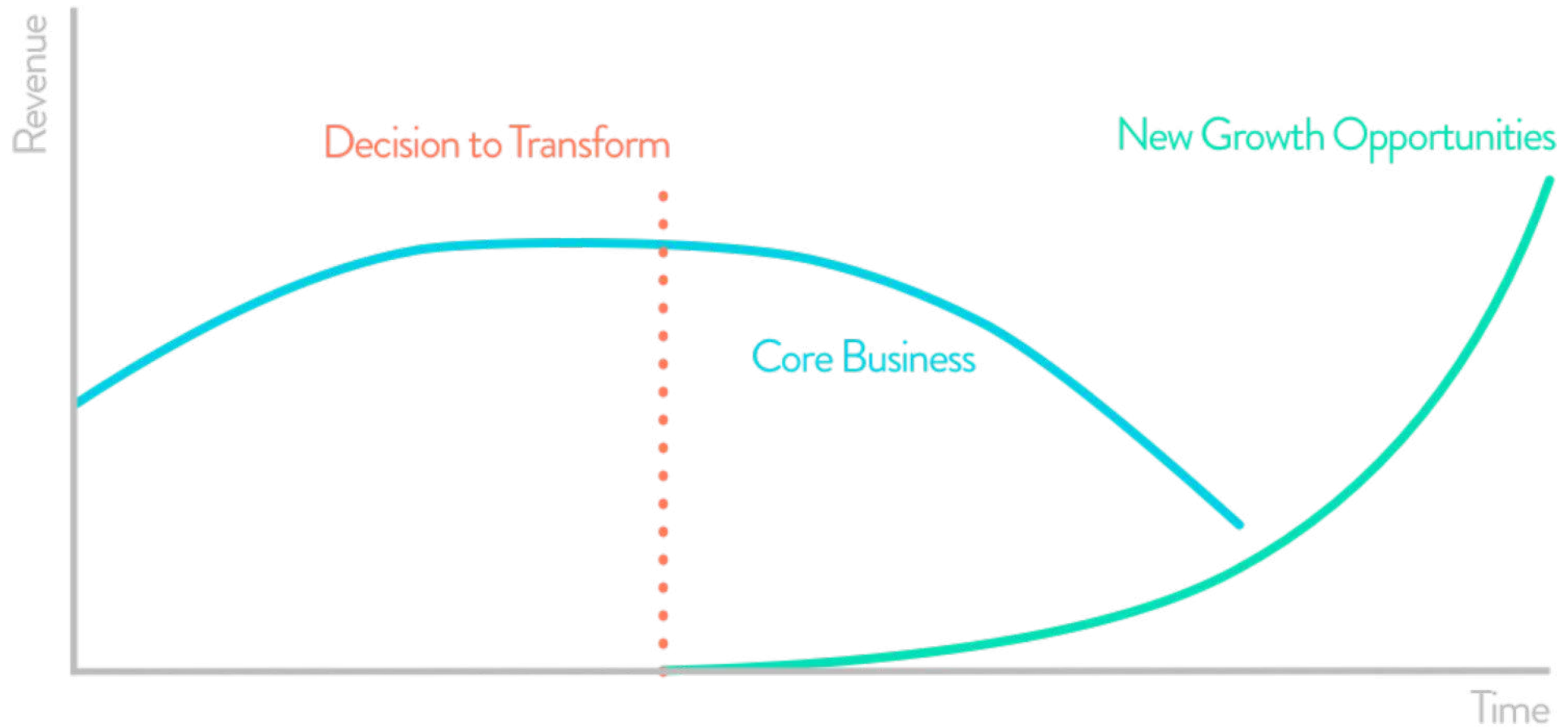


📷 The artificial reefs made from pear trees were sunk in the Wadden Sea in the Netherlands.
Photograph: Erik Hoekendijk/Royal Netherlands Institute for Sea Research

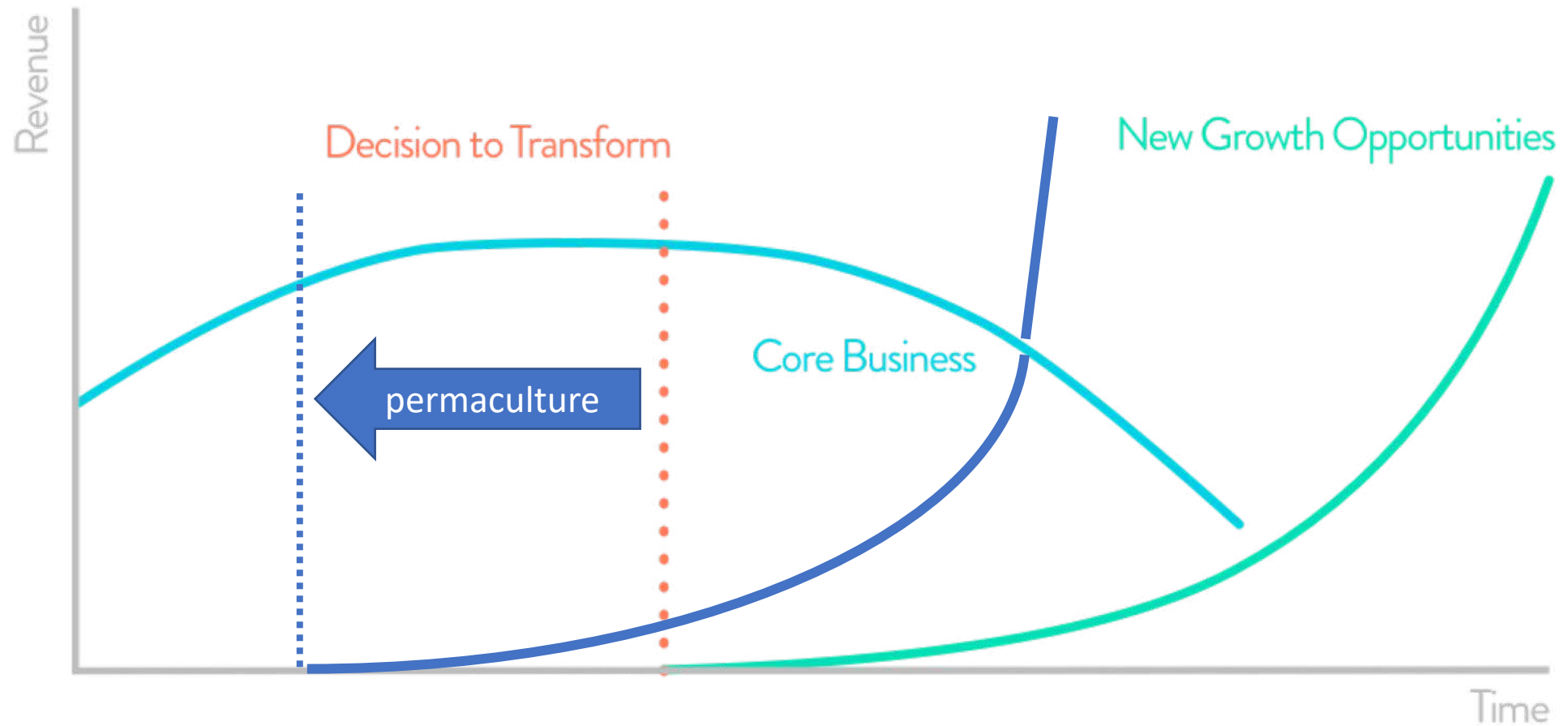
*“I feel like we’re at the point in this global biodiversity crisis where we need to accept that **we don’t know all the answers** and just start doing it on a wide scale [because] **some action is better than no action.**”*

*Jon Dickson, PhD candidate,
Royal Netherlands Institute for Sea Research*

The longer we wait, the more difficult (and expensive) it gets...



The longer we wait, the more difficult (and expensive) it gets...





*„it's easier to ask forgiveness
than it is to get permission“*

Definitions

Regenerative design & development **Bottom-up approach** Longtermism

Edible seascapes Community-Led Local Development

Marine permaculture Self-sufficiency

Regenerative aquaculture Biodynamics **Holistic management**

Transition Towns **Participatory approach**

Decentralisation **Devolved governance** **Food sovereignty**

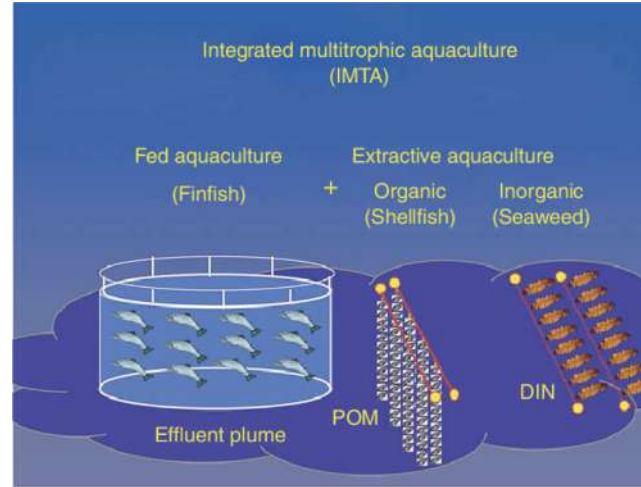
Bioremediation Social innovation

Behaviour change Community-Supported Aquaculture

Marine permaculture combines bioremediation with social innovation

- Low-effort
- Place-based
- Cross-disciplinary
- Holistic

- **Bioremediation:** *the use of either naturally occurring or deliberately introduced (micro)organisms to consume and break down environmental pollutants, in order to clean a polluted site.*

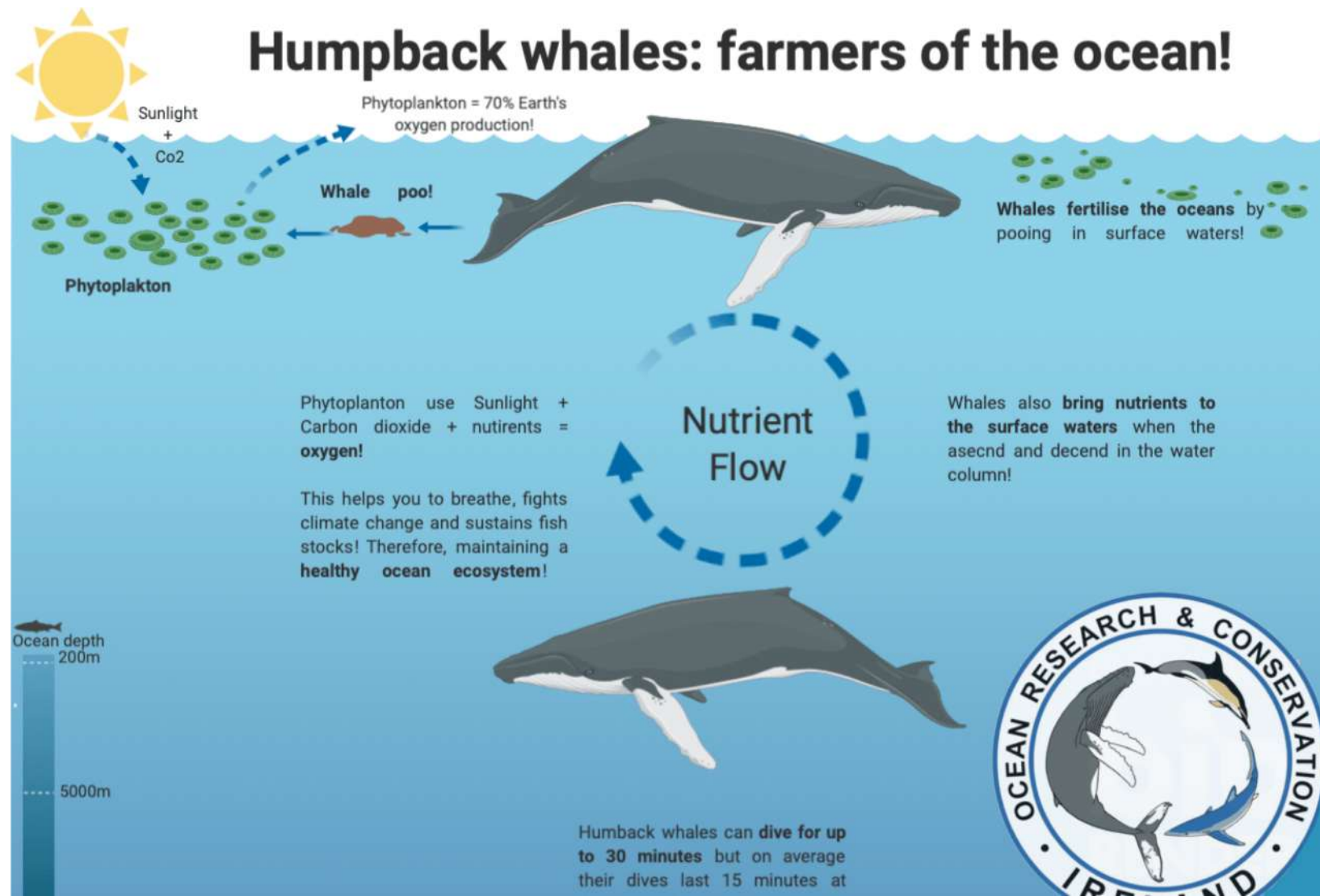


- **Social innovation:** *new social practices that aim to meet social needs in a better way than the existing solutions to strengthen civil society (e.g. working conditions, education, community development or health)*



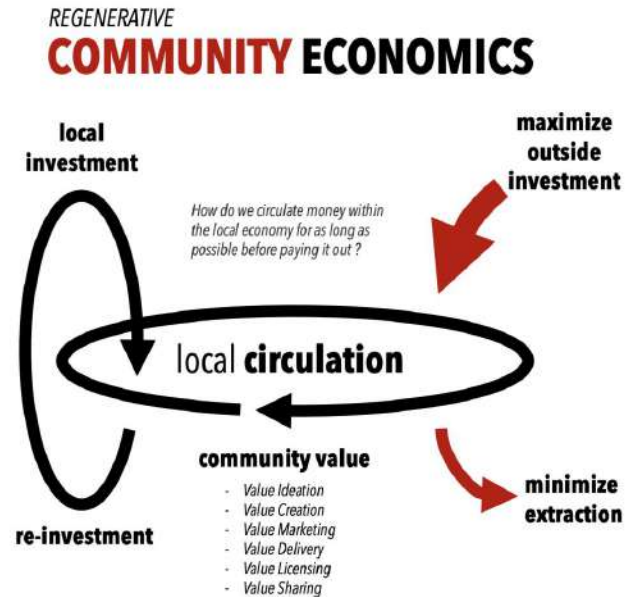
Marine permaculture for bioremediation

- Restoring the “biological pump”
- Cycling **oxygen & nutrients** between thermo- and halocline
- Boost biodiversity:
 - Create **habitat: substrates & niches** (artificial reefs, living breakwaters, sea walls)
 - Create **shelter** for breeding and food sources (seaweed)
 - Support plankton growth (**upwelling**)



Marine permaculture for social innovation

- New ways of creating **social capital** (community spirit)
- New way of **organising** communities e.g. community enterprises
- Often involves **digitalisation** (e.g. WhatsApp, citizen science apps)
- Direct to consumer e.g. veg box **apps**
- Local economic **sovereignty**
- MOTIVATION & MOBILISATION of local people



Sustainability is dead!



Graphic based on Reed, 2016 & Roland, 2018

What is regenerative aquaculture?

- Like regenerative agriculture (not yet co-opted)
- Incl. marine, brackish or freshwater aquaculture
- “*Regenerative **ocean farming***” **excludes** freshwater
- Regenerates local **ecosystems**
- Regenerates local **communities**
- Regenerates local **economies**



Why is permaculture relevant to regeneration of our waters?

Permaculture = a culture of permanence

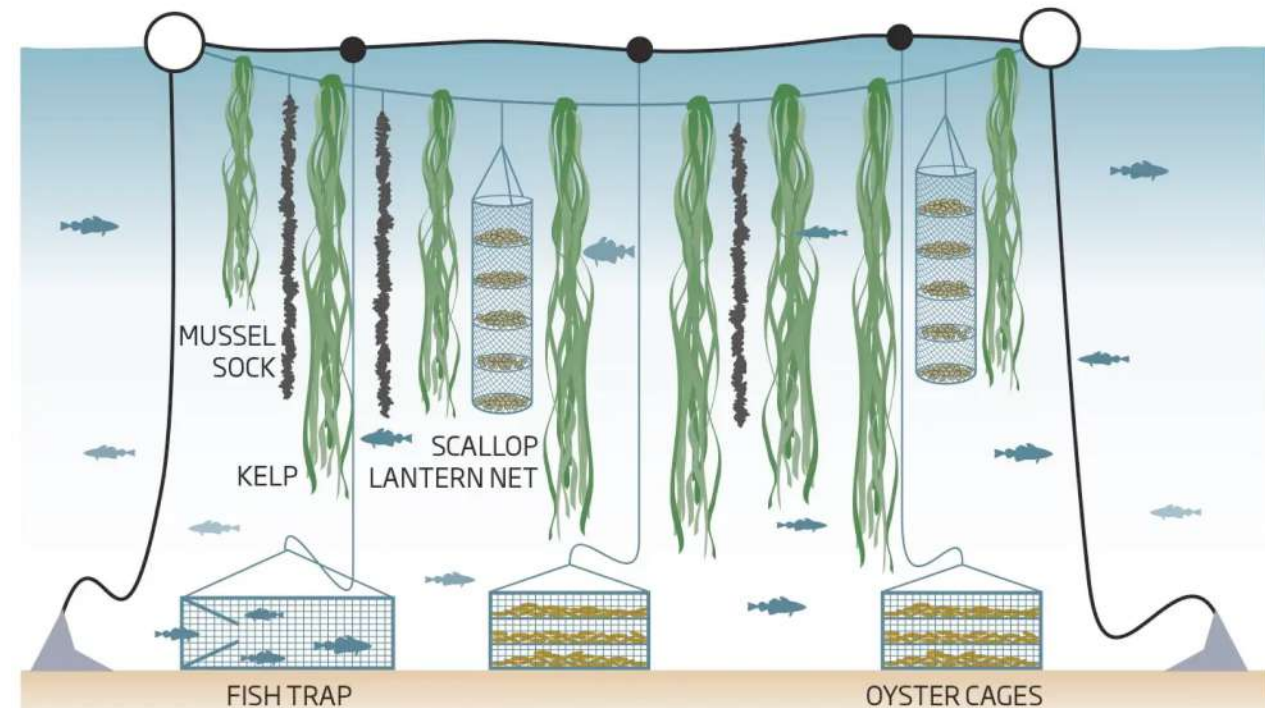
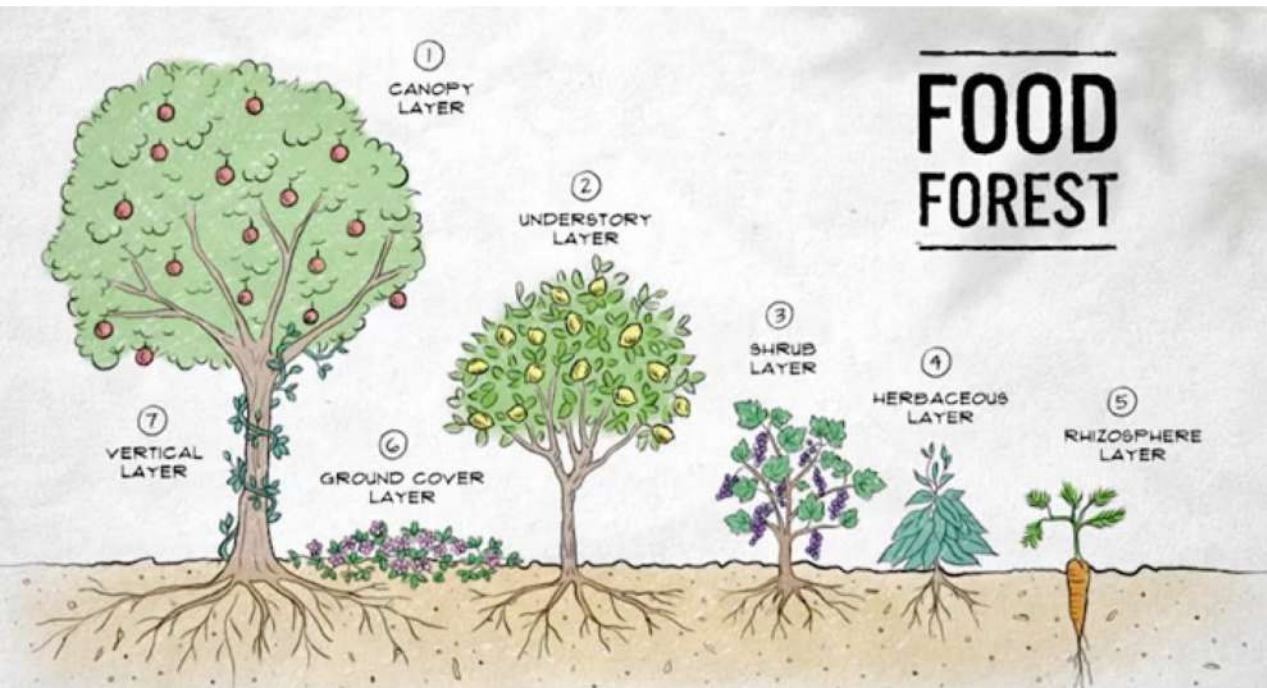
= investing in the future



“Longtermism” = *the ethical view that **positively influencing** the long-term future and **reducing existential risks to humanity** is a key moral obligation*

What is permaculture?

- The creation of **enabling conditions** for **self-reinforcing** systems of **biological abundance & resilience**
- ...by **catching, diverting** or **storing** **water, carbon, sunlight, heat** and **nutrients** and converting it into **biomass**



Permaculture Examples

Permaculture =
ecosystem services
& habitat creation



Permaculture = education





**Permaculture =
Water management**





Permaculture = Water management

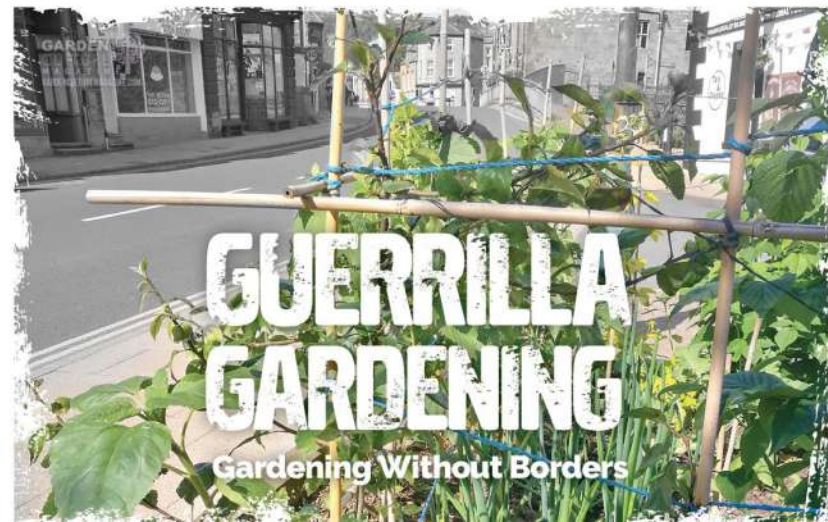


Permaculture = self-reinforcing



Permaculture = self-reinforcing





Permaculture =
community activism

The Three Sisters: Companion Planting

- Practiced by the Iroquois since 1300s
- Provides soil fertility and healthy diet from single planting
- Corn, planted in center, offers support for pole beans
- Beans add nitrogen to soil, provides further structure
- Squash leaves cool soil and hinder weeds



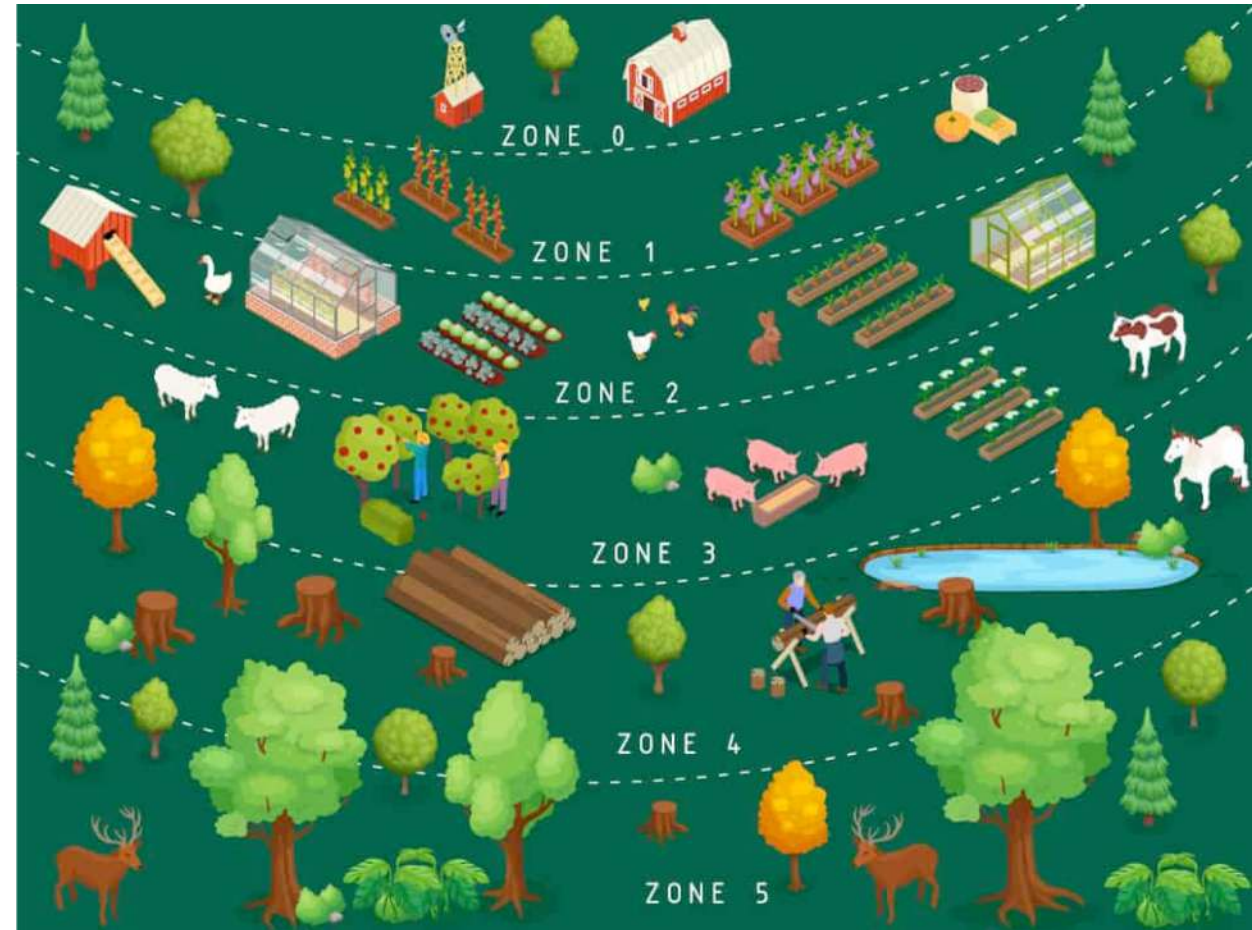
Treehugger

**Permaculture =
Reciprocal**

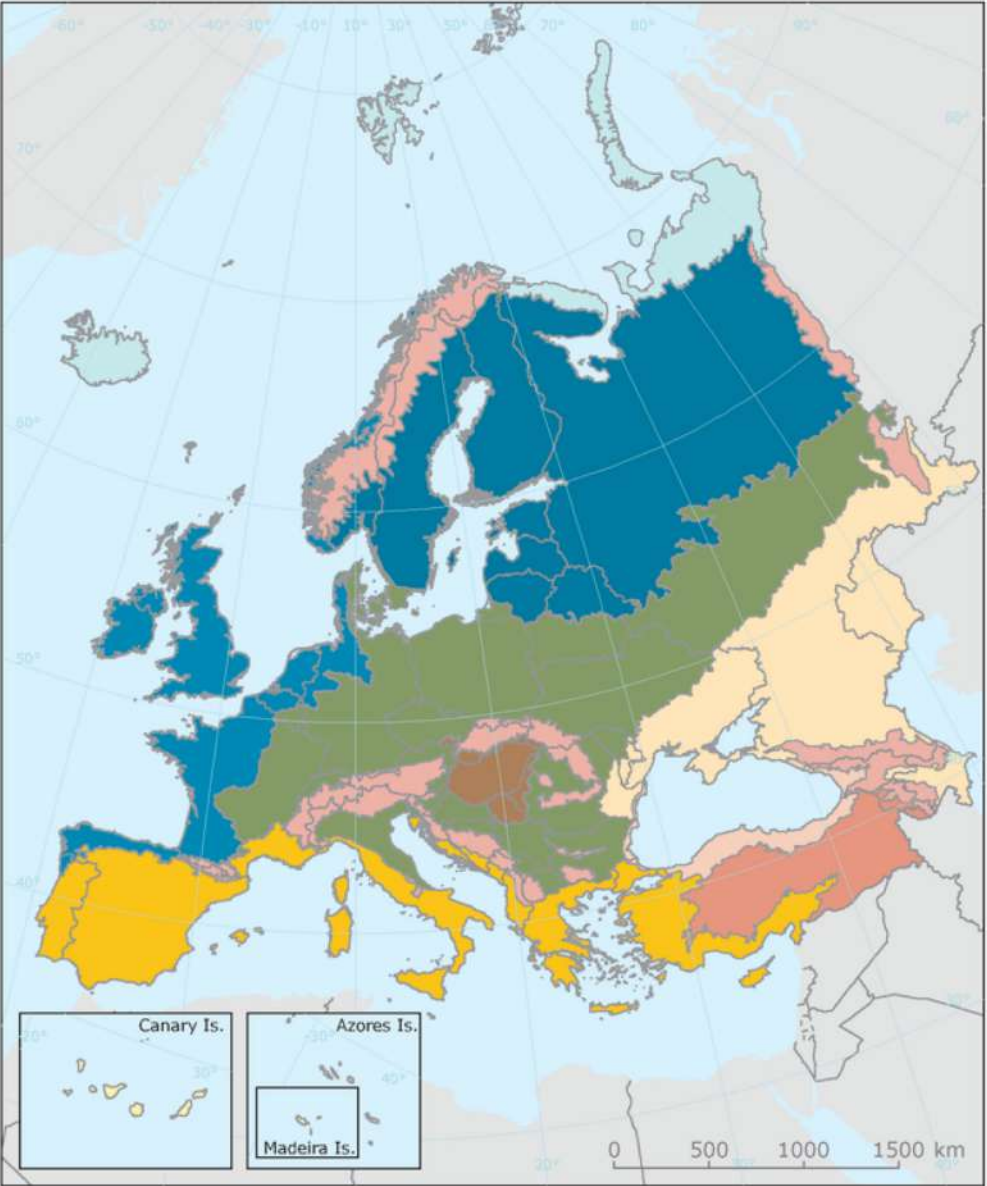
**i.e. mutually beneficial
relationships**

Permaculture = Spatial Planning / Zoning

- Zone 0 = home
- Zone 1 = daily maintenance (e.g. herbs)
- Zone 2 = perennials
- Zone 3 = low maintenance crops
- Zone 4 = semi-wild (foraging)
- Zone 5 = wild area

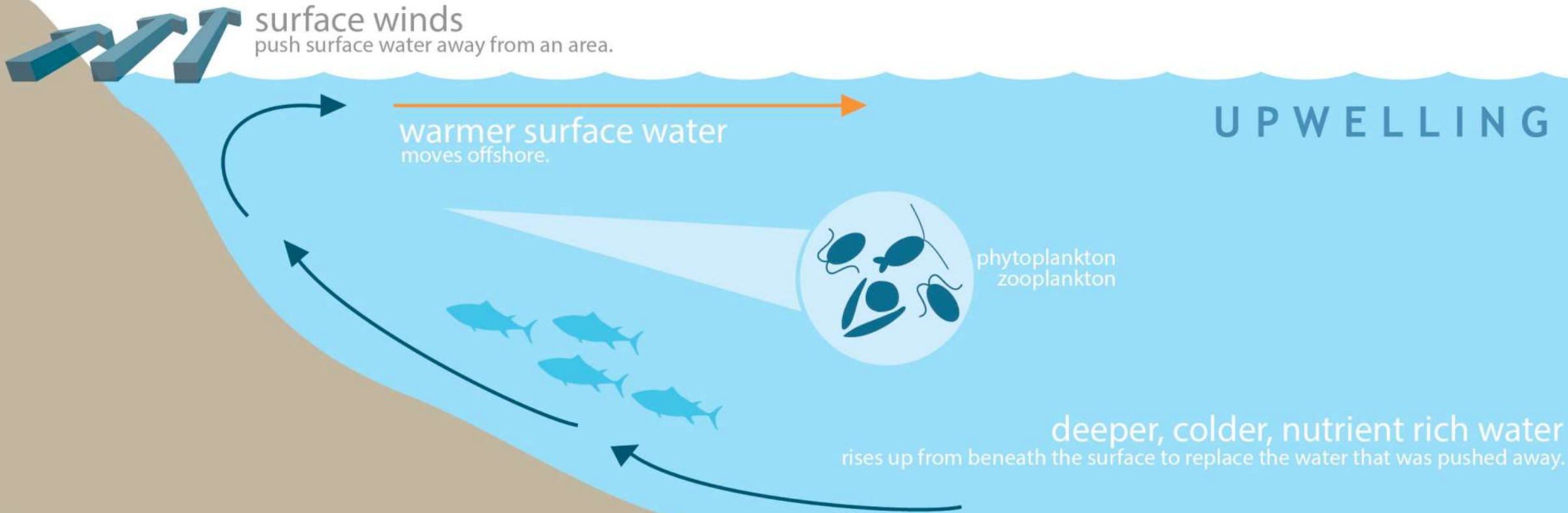


Permaculture = bioregionalism



What does marine permaculture look like?

Permaculture = observation



Permaculture = education



Permaculture = self-reinforcing



Permaculture = self-reinforcing



Permaculture = community spirit



Permaculture = community activism



Article | [Open access](#) | [Published: 04 March 2020](#)

Green gravel: a novel restoration tool to combat kelp forest decline

[Stein Fredriksen](#) , [Karen Filbee-Dexter](#), [Kjell Magnus Norderhaug](#), [Henning Steen](#), [Torjan Bodvin](#), [Melinda A. Coleman](#), [Frithjof Moy](#) & [Thomas Wernberg](#) 

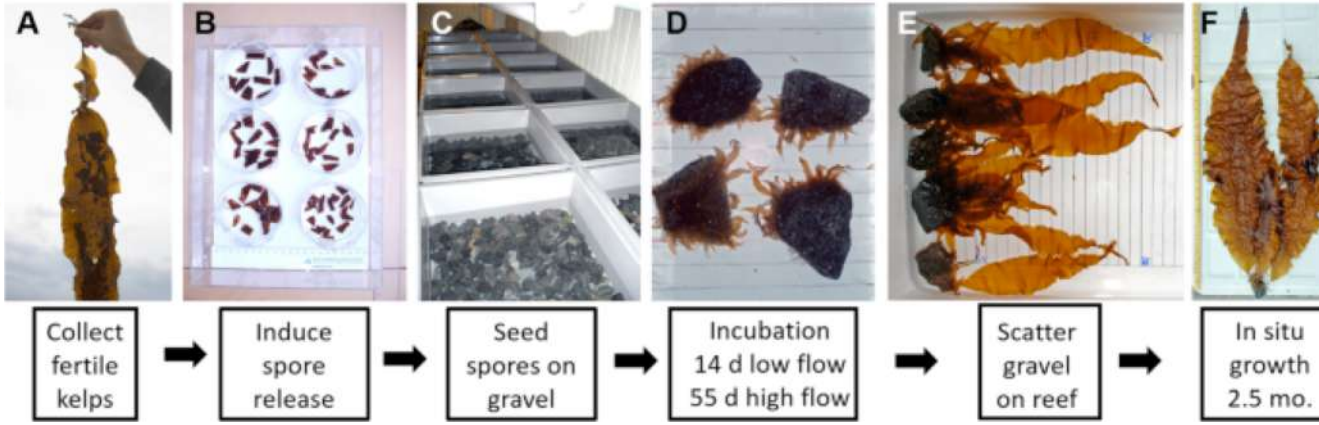
Scientific Reports **10**, Article number: 3983 (2020) | [Cite this article](#)

11k Accesses | 44 Citations | 71 Altmetric | [Metrics](#)

Abstract

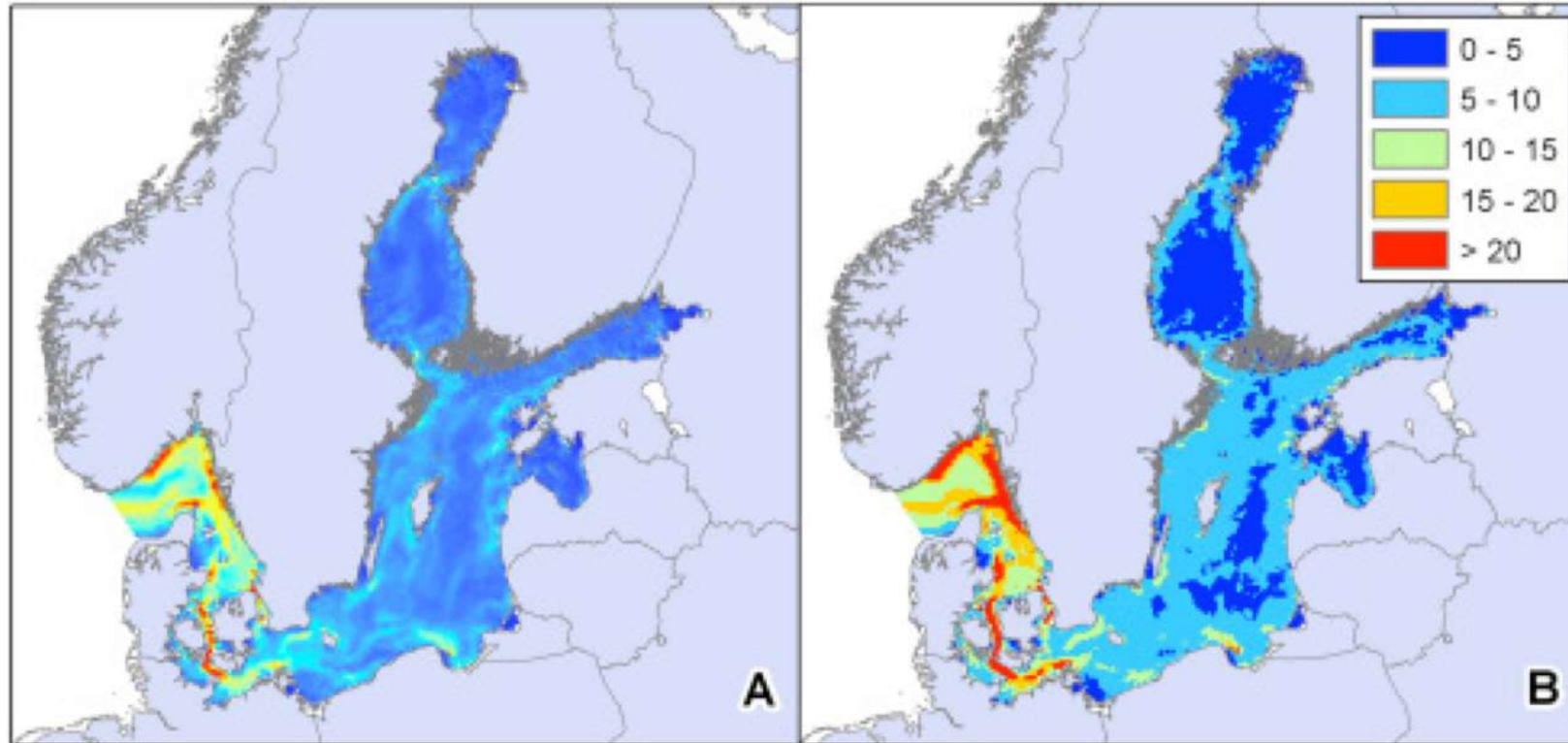
Kelp forests are in decline globally and large-scale intervention could be required to halt the loss of these valuable ecosystems. To date kelp forest restoration has had limited success and been expensive and unable to address the increasing scale of ecosystem deterioration. Here we developed and tested a new approach: "green gravel". Small rocks

Permaculture =
Community activism



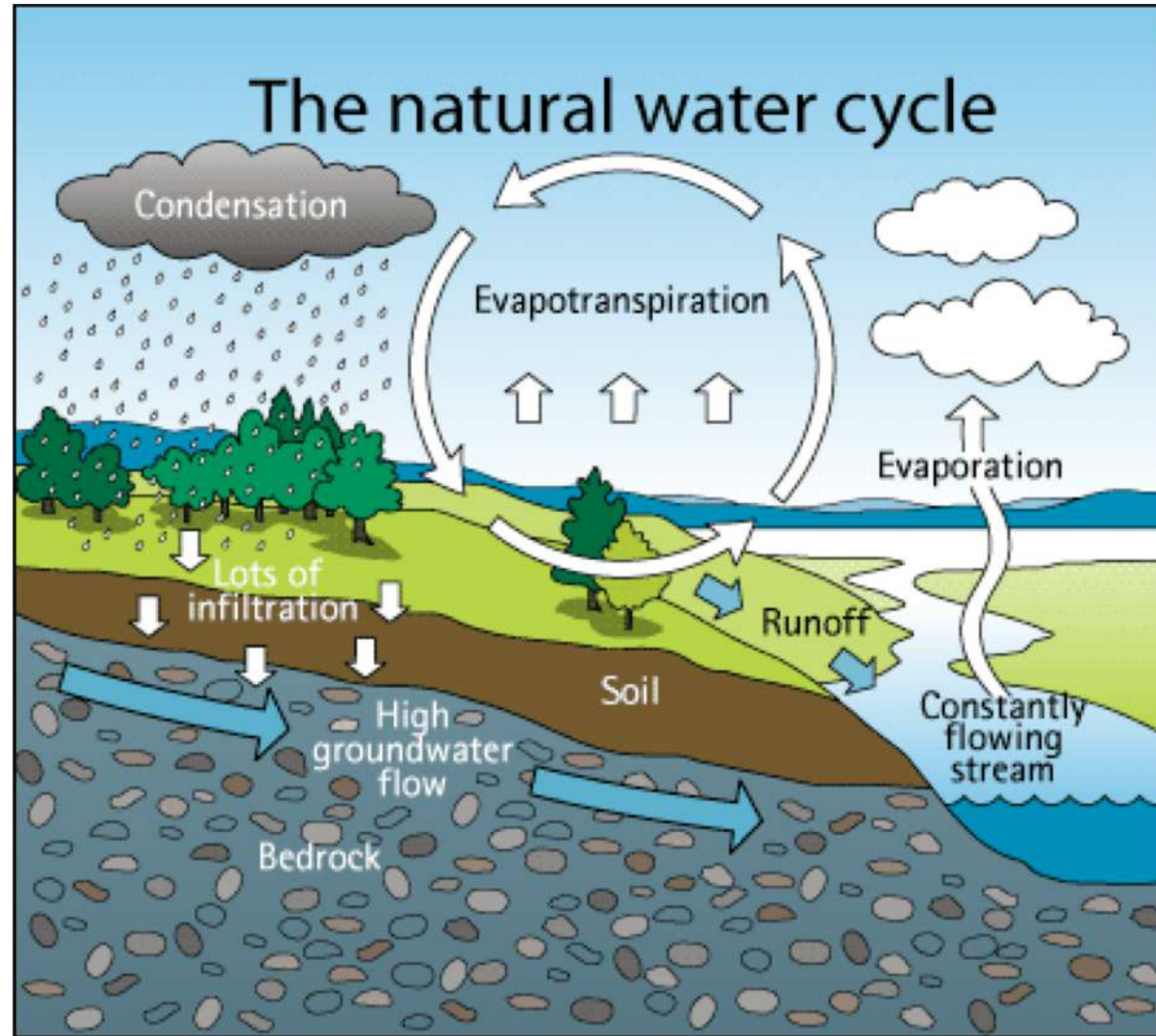
Permaculture = community activism

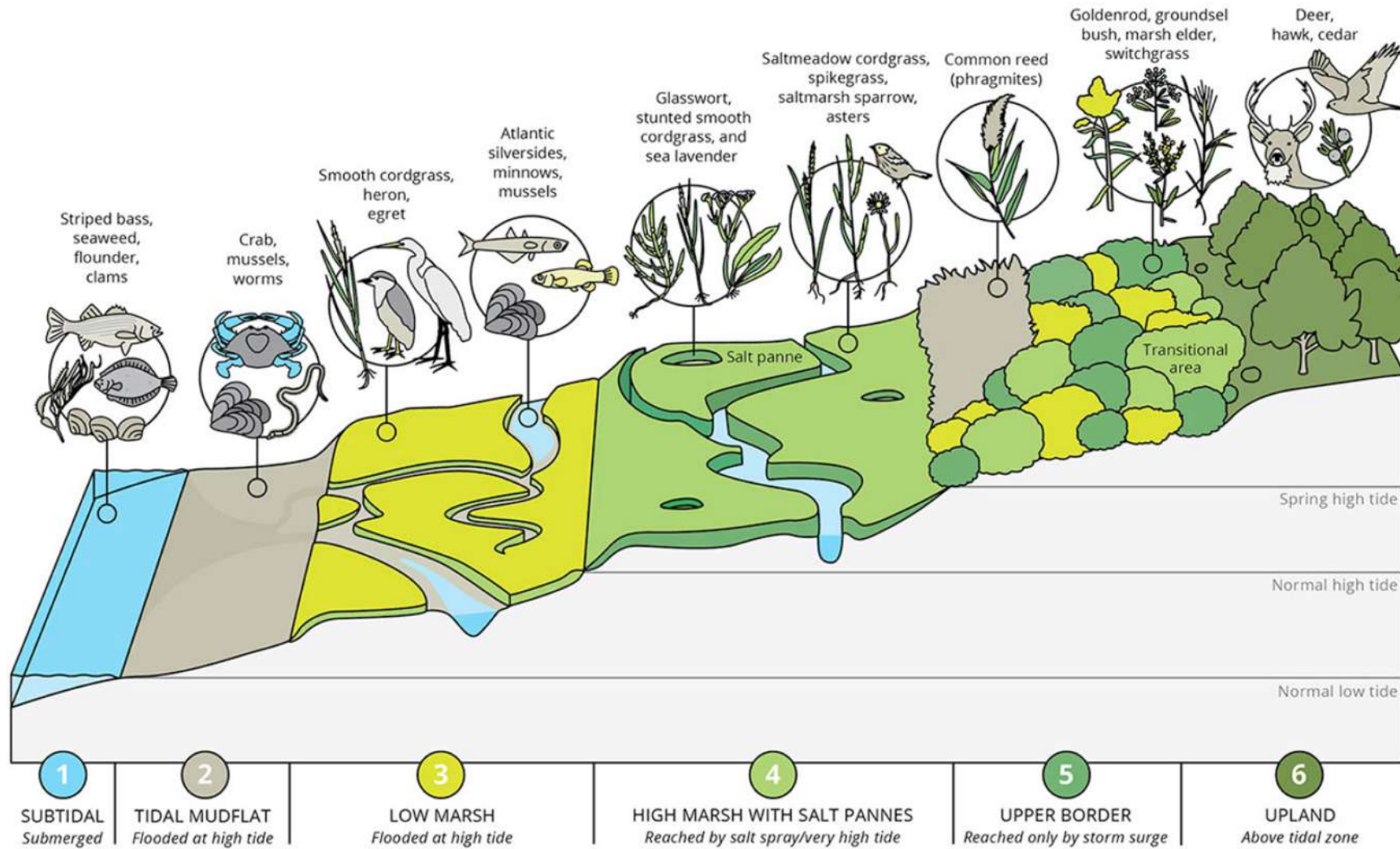




Permaculture =
bioregions

Permaculture = Water management





Permaculture = spatial planning / zoning

LUCY READING-IKKANDA

Newsletter 1 - March 2018



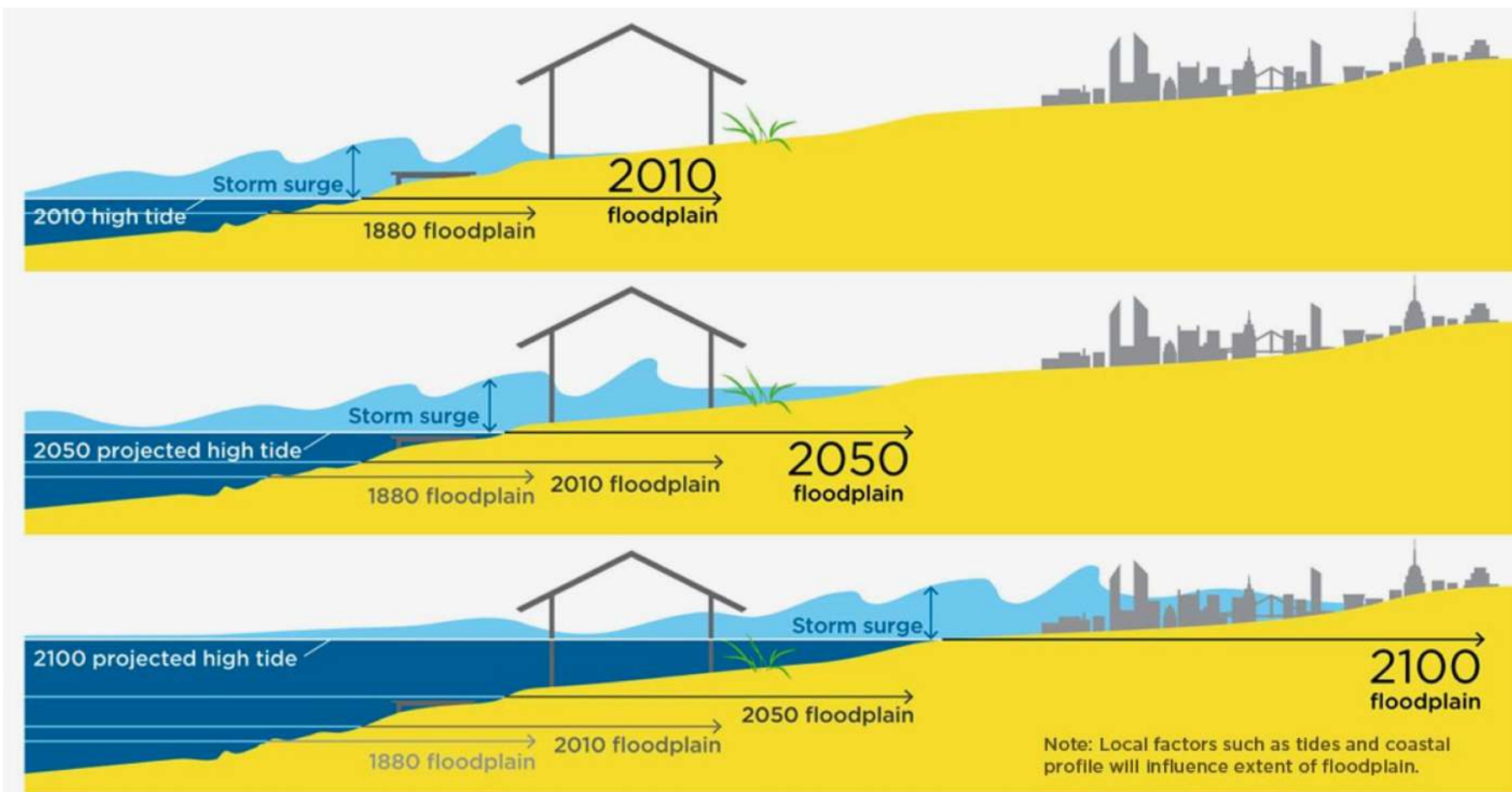
Saline Farming

Saline Farming - Innovative agriculture to protect the environment and stimulate economic growth

This is the very long title of our project, but don't worry, we just call it "SalFar". The SalFar project deals with climate change and sea level rise and the challenges this raises for farming and agriculture across the North Sea Region. After two years of planning and intensive discussions within our partner consortium, the project SalFar was approved in June 2017 by the Interreg VB North Sea Region Programme

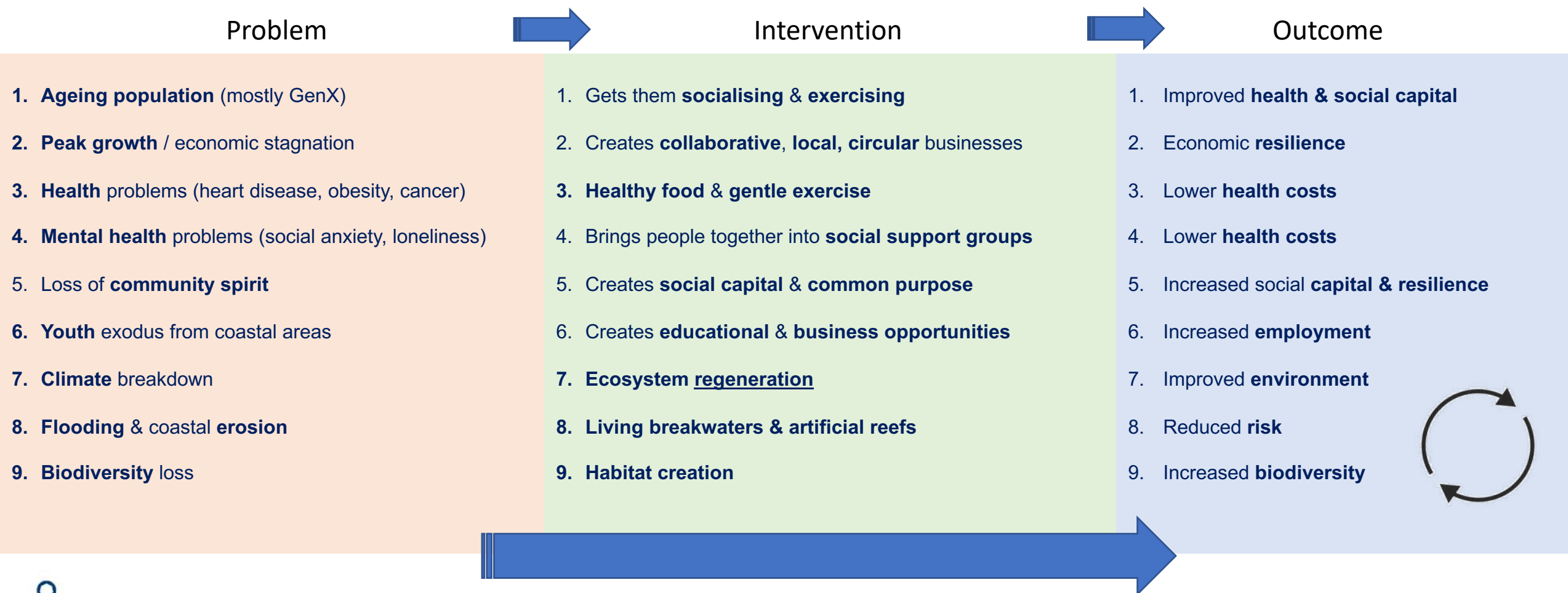
of our crops and plants? Are there any crops that can resist or have a higher tolerance against salt? What are the policies for coastal protection, agriculture and water management in Denmark, Sweden, Norway, the UK, Belgium, The Netherlands and Germany? These are the questions we are working on and want to find solutions for within the project "SalFar". We, that is the following partner consorti-





Sea level sets a baseline for storm surge—the potentially destructive rise in sea height that occurs during a coastal storm. As local sea level rises, so does that baseline, allowing coastal storm surges to penetrate farther inland. With higher global sea levels in 2050 and 2100, areas much farther inland would be at risk of being flooded. The extent of local flooding also depends on factors like tides, natural and artificial

What societal problems does permaculture address?



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Mission: Ocean

BlueMissionBANOS

Regional Deployment Roadmaps to 2030

What's next?

- 15:15-15:45 **Coffee break**
- 15:45-17:45 **Workshops:**
 - *Safeguarding biodiversity & MPA networks* / **Main Hall**
 - *Do's and don'ts of permits for low-trophic aquaculture* / **Decibel**
 - *Skills: upskilling for the blue economy* / **Pascal**
 - Mission Ocean Governance / **Newton** (invitation only)
 - UNITED final event: multi-use technology roadshow / **Kelvin**
- BlueBioMatch