

Bringing ecology into decision-making – a comparison of approaches

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deputy director
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First: a backstory to set the scene

Estuarine, Coastal and Shelf Science (2002) 55, 427–436

doi:10.1006/ecss.2001.0916, available online at <http://www.idealibrary.com> on IDEAL®



Do Penaeid Shrimps have a Preference for Mangrove Habitats? Distribution Pattern Analysis on Inhaca Island, Mozambique

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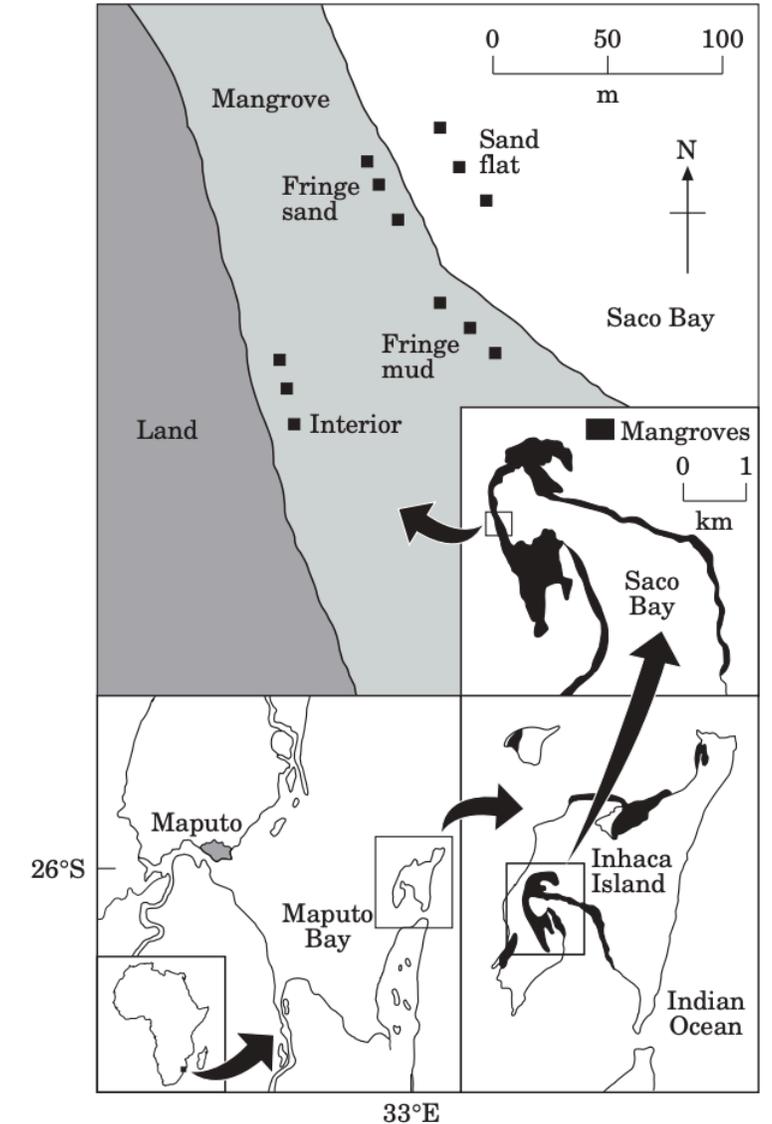
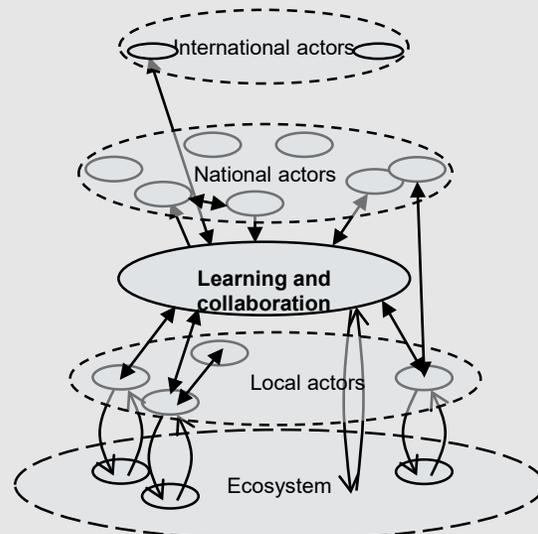
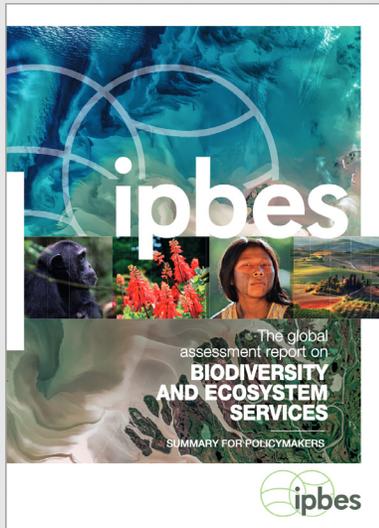


FIGURE 1. Location of stake net sampling sites at Inhaca Island, Mozambique.

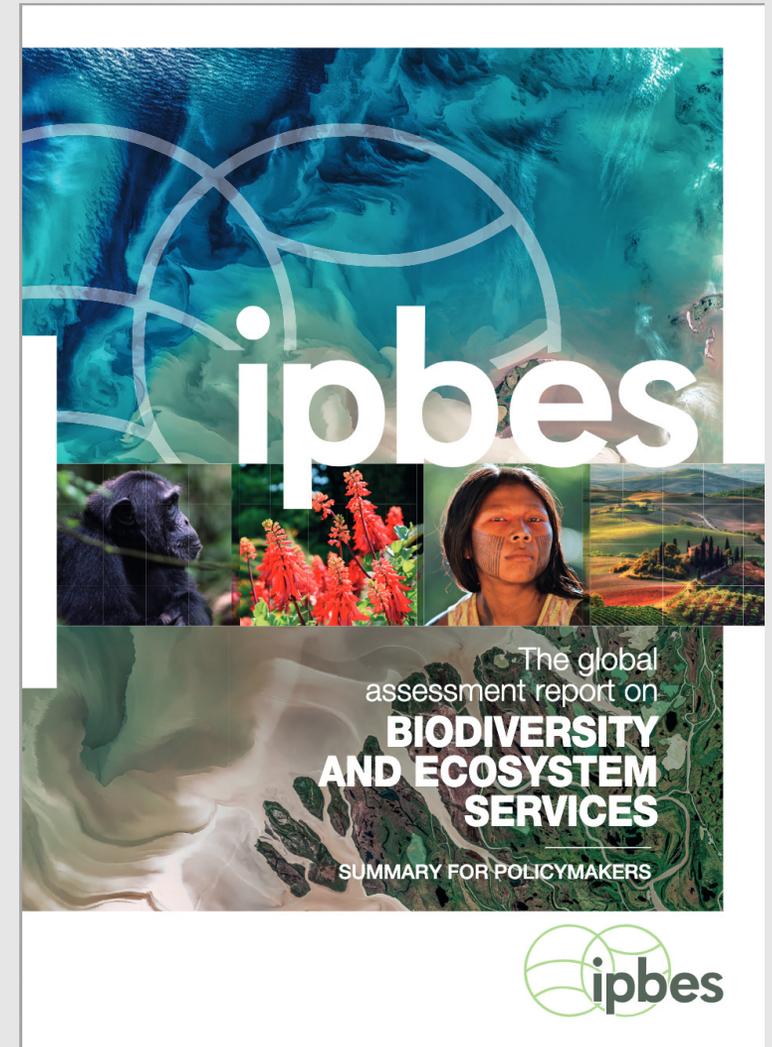
Three approaches

- Scientific assessments (Cash et al. 2003)
- Adaptive co-management (Armitage et al. 2008)
- Keystone dialogues (Österblom et al. 2022)



1. Scientific assessments: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

- Assesses existing knowledge on biodiversity and ecosystem services – ca 15 000 sources
- Multi-year process involving several hundreds of scientists
- Report written for policy-makers in 140 member states



High-level messages of Global assessment (IPBES 2019)

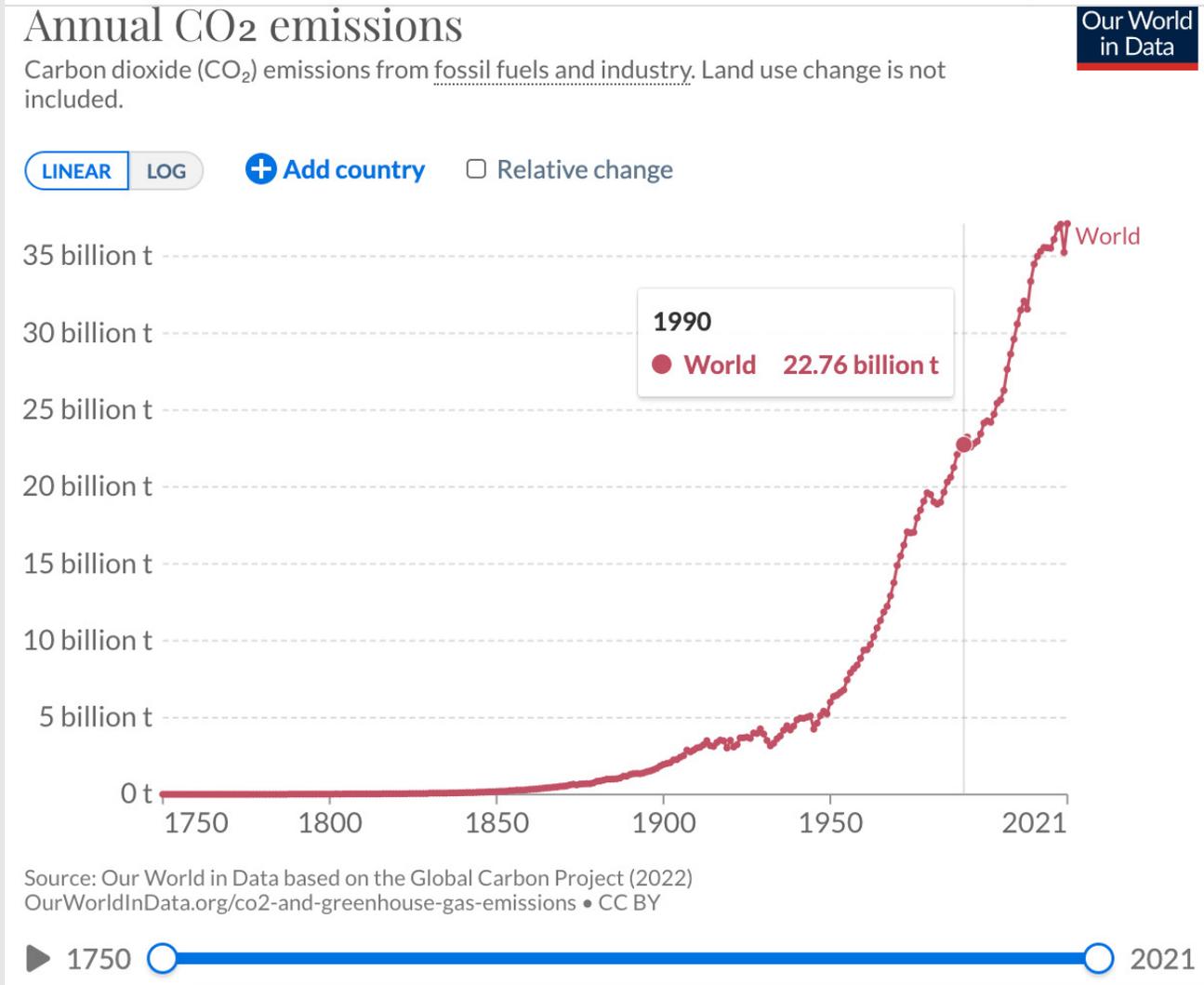
- 1 million species threatened with extinction
- Drivers of loss include (1) changes in land and sea use; (2) direct exploitation of organisms; (3) climate change; (4) pollution and (5) invasive alien species.
- Three-quarters of the land-based environment and about 66% of the marine environment have been significantly altered by human actions – less severe in areas managed by Indigenous Peoples.
- Negative trends in nature will continue to 2050 and beyond in all of the policy scenarios explored in the Report, except those that include transformative change
- Negative trends in ecosystems undermine progress towards 80% of the assessed targets of the Sustainable Development Goals, related to poverty, hunger, health, water, cities, climate, oceans and land.

How decision-makers responded (CBD 2022)

- Protect 30% and restore 30% by 2030, recognizing indigenous territories
- Prevent over-harvesting
- Reduce pollution (nutrients, pesticides, plastics)
- Require large and transnational companies and financial institutions to monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity through their operations, supply and value chains and portfolios



However, the track-record is questionable



- First IPCC Assessment Report published in 1990
- Paris agreement to limit warming to well below 2 degrees adopted in 2015
- Global emissions keep rising

This model is incomplete

Central policy-maker (e.g.
Environmental ministry)

Regional/Local authority

Local natural resource user



Decision-making

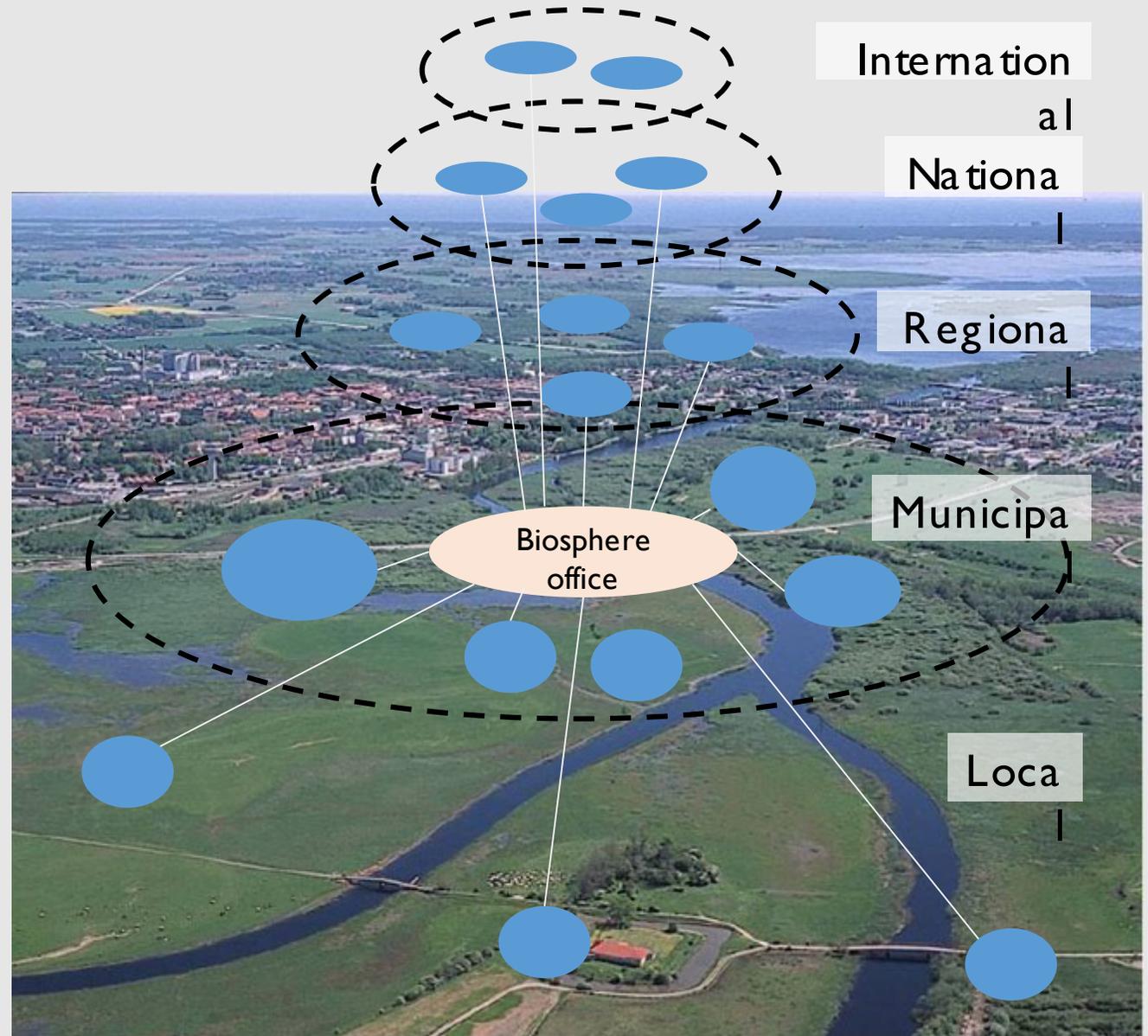
Implementation and
monitoring

Behavioural response

2. Adaptive co-management: Kristianstads Vattenrike

- Combines local and scientific knowledge
- Flexible collaborations, connecting sectors and scales
- Shared vision: "Good for people and nature"

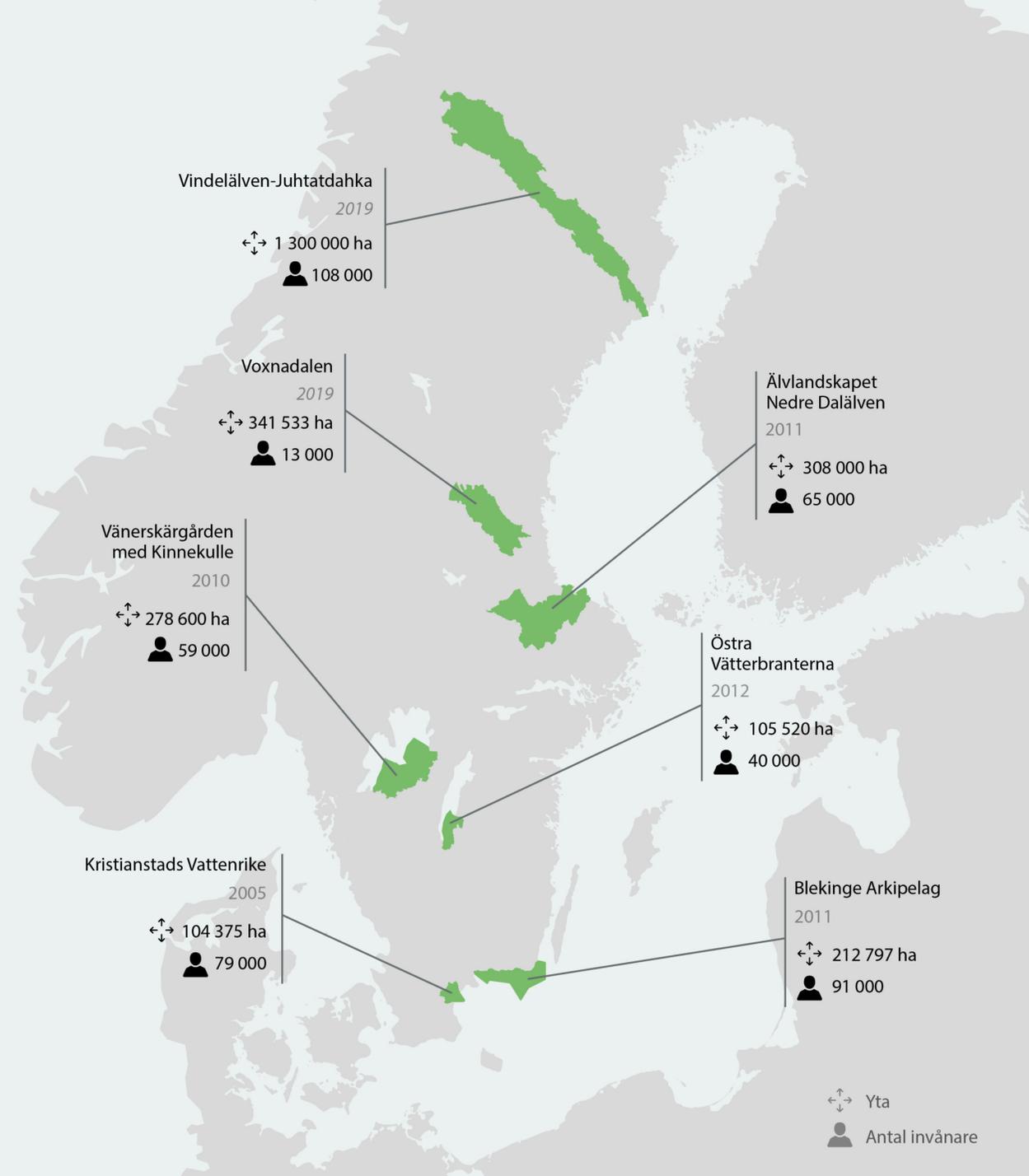
(Olsson et al. 2004, Folke et al. 2005, Schultz et al. 2015)

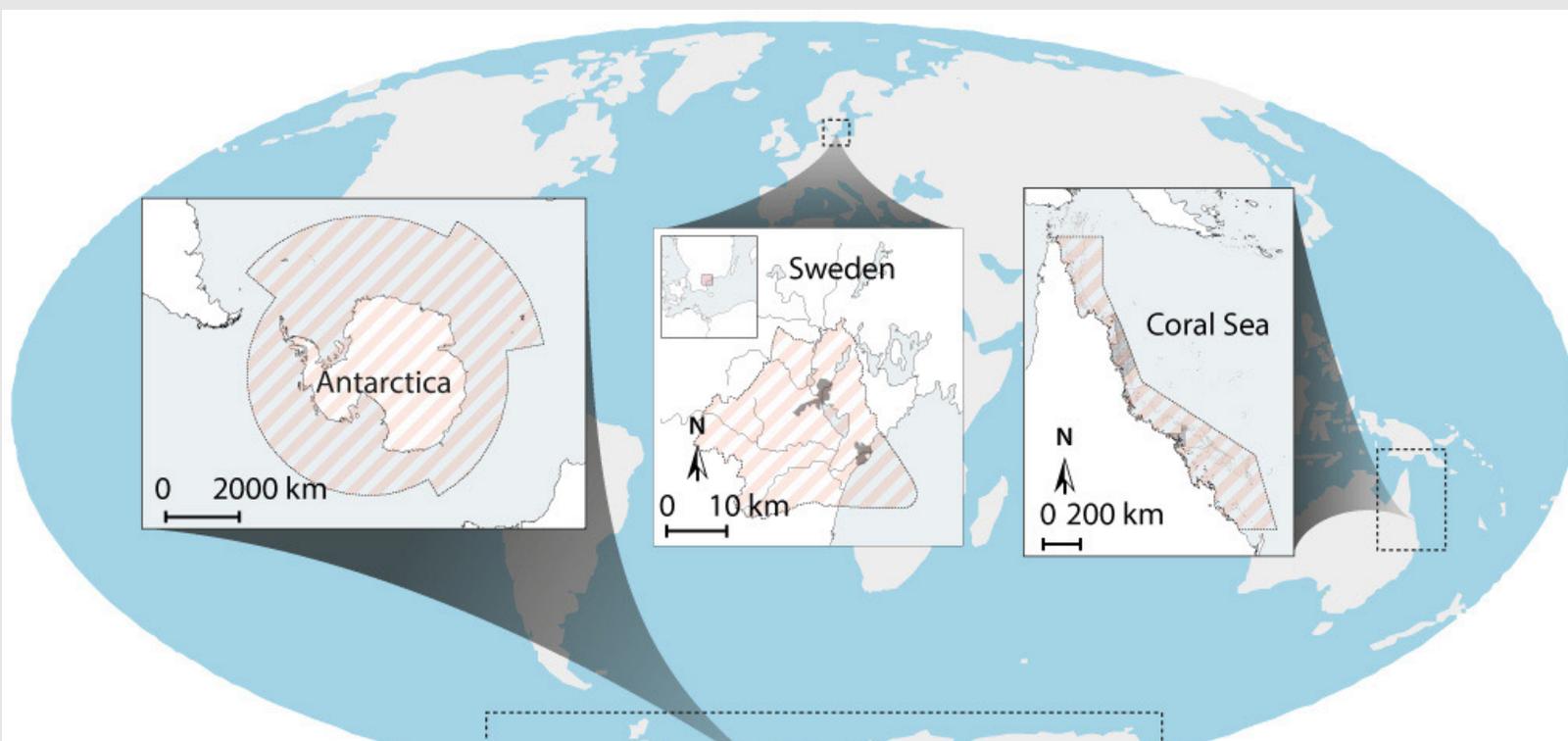


Sweden's first UNESCO biosphere reserve in 2005



www.biosfarprogrammet.se





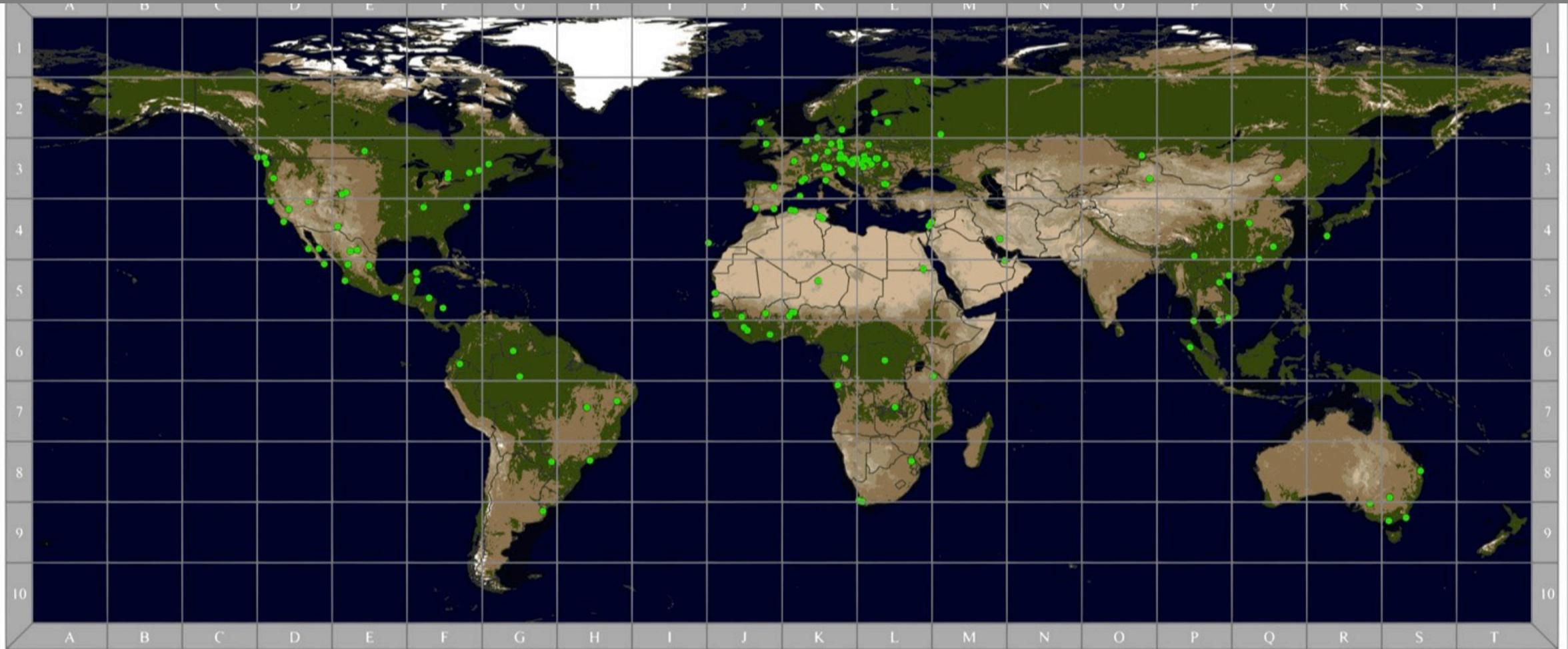
Curbing illegal fisheries in the Southern Ocean

Restoring cultural landscapes in Kristianstads Vattenrike

Rezoning the Great Barrier Reef

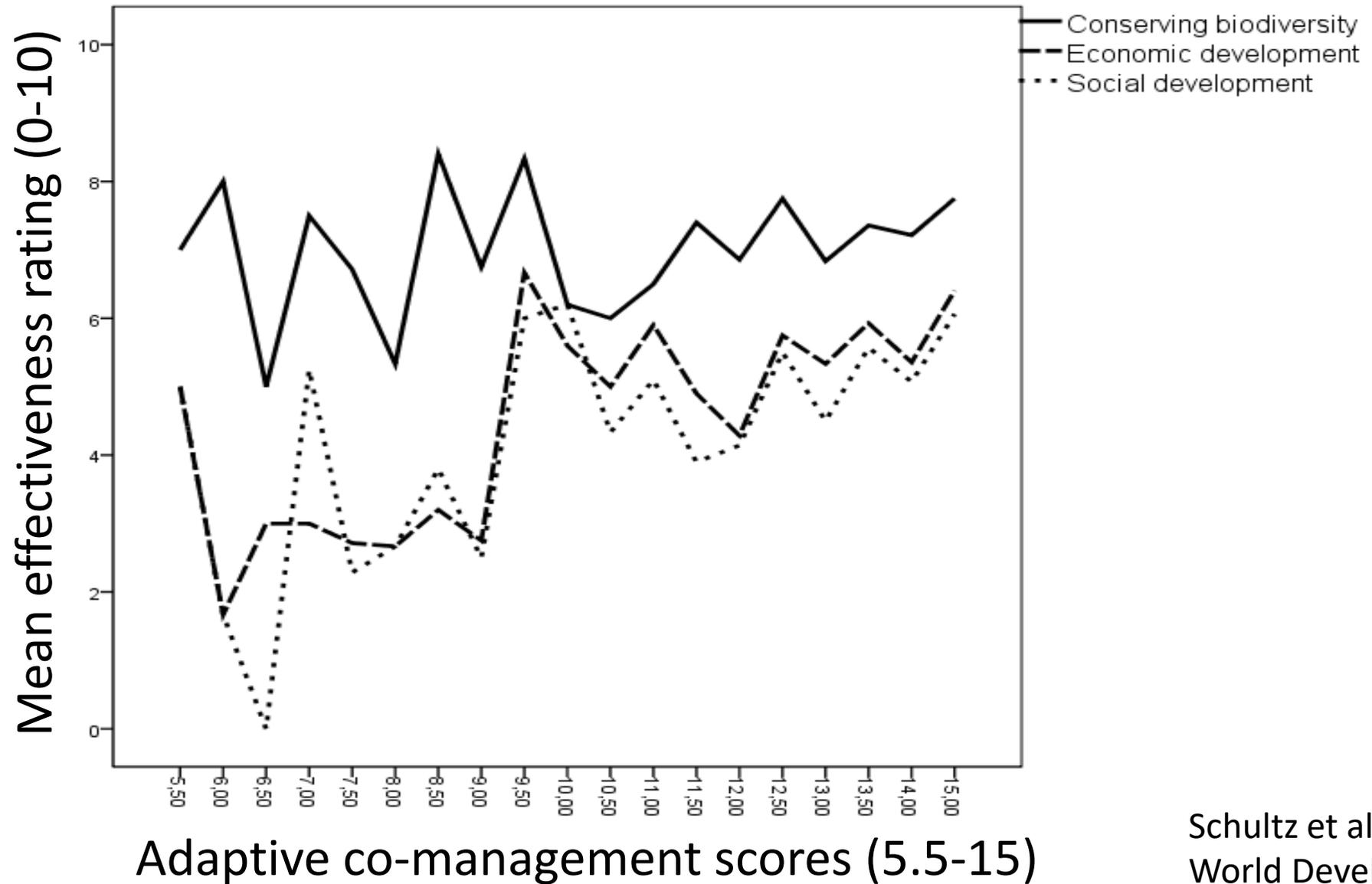


Effectiveness and adaptive co-management (n=146 BR, 2008)



Aggtelek, Hungary.....L3	Central Plains, USA.....E3	Frontenac Arch, Canada.....NS	Lake Manyara, Tanzania.....M6	Parc Suisse, Switzerland.....K3	Spreewald, Germany.....K3
Air et Ténéré, Niger.....K5	Cerrado, Brazil.....H7	Gaoligong Mountain, China.....P4	Laplandskiy, Russian Federation.....L2	Pays de Fontainebleau, France.....K3	Steneto, Bulgaria.....L3
Alto Orinoco - Casiquiare, Venezuela.....G6	Chamela-Cuizmalá, Mexico.....E5	Georgian Bay Littoral, Canada.....F3	Lower Morava, Czech Republic.....K3	Pendjari, Benin.....K5	Sumaco, Ecuador.....F6
Archipelago Sea Area, Finland.....L2	Channel Islands, USA.....D4	Gouraya, Algeria.....K4	Lufira, Democratic Republic of Congo.....L7	Pfälzervald/Vosges du Nord, France/Germany.....K3	Sumava, Czech Republic.....K3
Arjan, Islamic Republic of Iran.....M4	Charlevoix, Canada.....G3	Grosses Walsertal, Austria.....K3	Luki, Democratic Republic of Congo.....K7	Pietrosul Mare, Romania.....L3	The Karst, Slovenia.....K3
Babia Gora, Poland.....L3	Chebaling, China.....Q5	Gunung Leuser, Indonesia.....P6	Mammoth Cave Area, USA.....F4	Pilis, Hungary.....L3	Trebon Basin, Czech Republic.....K3
Baishuijiang, China.....P4	Chrea, Algeria.....K4	Gurgler Kamm, Austria.....K3	Mapimi, Mexico.....E4	Podocarpus-El Condor, Ecuador.....NS	Tsaritchina, Bulgaria.....L3
Baotianman, China.....Q4	Clayoquot Sound, Canada.....C3	H.J. Andrews, USA.....D3	Marawah, United Arab Emirates.....M5	Polana, Slovakia.....L3	Valles del Jubera, Leza, Cidacos y Alhama, Spain.....J3
Beinn Eighe, United Kingdom.....J2	Costero del Sur, Argentina.....G9	Haut Niger, Guinea.....J5	Mare aux hippopotames, Burkina Faso.....J5	Prioksko-Terrasnyi, Russian Federation.....M2	Vessertal-Thüringen Forest, Germany.....K3
Bia, Ghana.....J6	Croajingolong, Australia.....S9	Hortobágy, Hungary.....L3	Mariposa Monarca, Mexico.....NS	Puszcza Kampinoska, Poland.....L3	Virginia Coast, USA.....F4
Bilé Karpáty, Czech Republic.....K3	Cuatrocienegas, Mexico.....E4	Isla Marietas, Mexico.....NS	Massif du Ziamá, Guinea.....J6	Ranong, Thailand.....P5	W' Region, Benin.....K5
Bogeda, China.....O3	Delta du Fleuve Sénégal, Senegal.....J5	Islas del Golfo de California, Mexico.....D4	Mata Atlántica, Brazil.....H8	Ria Lagartos, Mexico.....F5	W' Region, Burkina Faso.....K5
Boitine, Bulgaria.....L3	Desert, USA.....D4	Jornada, USA.....E4	Menorca, Spain.....K3	Riding Mountain, Canada.....E3	Waddensea and Hallig Islands of Schleswig-Holstein, Germany.....K3
Boloma Bijagós, Guinea-Bissau.....J5	Djebel Bou-Hedma, Tunisia.....K4	Julian Alps, Slovenia.....K3	Mont Saint-Hilaire, Canada.....F3	Rio Plátano, Honduras.....F5	Waddensea Area, Netherlands.....K3
Bosque Mbaracayú, Paraguay.....G8	Djebel Chambi, Tunisia.....K4	Katunsky, Russian Federation.....O3	Mont Ventoux, France.....K3	Riverland, Australia.....R9	Wadi Allau. Ezyvt.....L5
Caatinga, Brazil.....H7	Diendema, Bulgaria.....L3	Kien Giang, Vietnam.....P6	Monts Nimba, Guinea.....J6	Rocky Mountain, USA.....E3	

Effectiveness and adaptive co-management (n=146 BR, 2008)



But what about decision-makers who influence ecosystems from afar?



Image: Globaia, in Folke et al. 2021

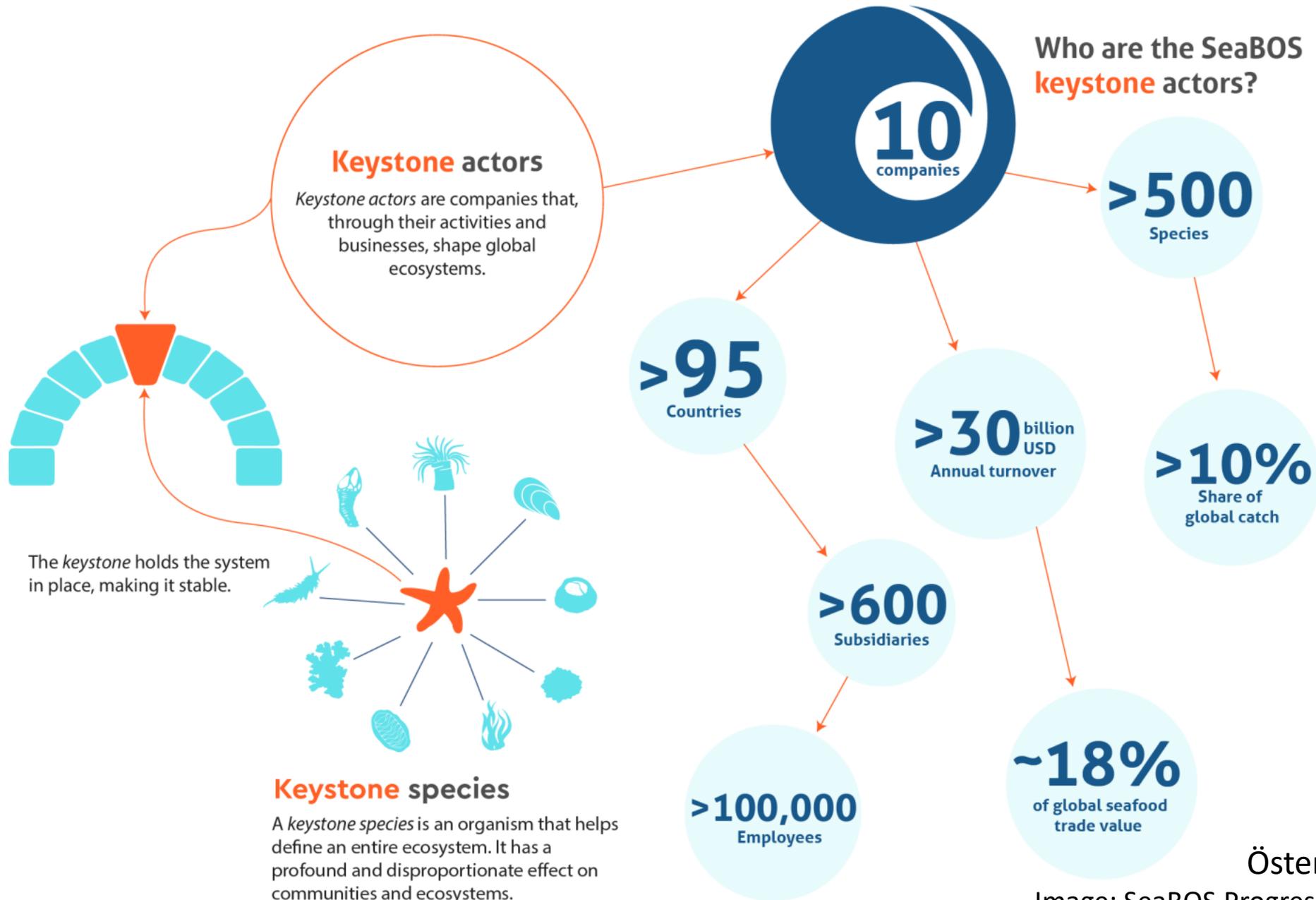
3. KEYSTONE DIALOGUES

Connecting science with industry leaders for biosphere stewardship



<http://keystonedialogues.earth/>

From keystone species to keystone actors



Österblom et al. 2015

Image: SeaBOS Progress Report 2017-2022

KEYSTONE DIALOGUES

Connecting science with industry leaders for biosphere stewardship

Joint Statement from the 1st Keystone Dialogue
SEAFOOD BUSINESS FOR OCEAN STEWARDSHIP



PREAMBLE

We represent eight of the world's largest seafood companies, collectively operating in all segments of marine fisheries and aquaculture production, across the entire world. As leaders in the global seafood industry, we are concerned about the state of the ocean and the global environment.

We depend on a stable and resilient planet for human prosperity. However, science is already providing evidence that we have entered the Anthropocene, an epoch where humanity is now challenging the stability of Earth and its oceans.

We, as keystone actors in the global seafood industry¹, recognize that together we represent a global force, not only in the operation of the seafood industry, but also in contributing to a resilient planet with marine ecosystems continuing to produce food of high quality for present and future generations.

We already make a significant contribution to healthy and nutritious diets, as well as to employment all around the world, helping to provide food security for all. We are confident that an increased production of seafood – caught in a healthy ocean using sustainable fishing methods or farmed in sustainable production systems, by people employed in safe and fair working conditions – is both possible and critical for the future of humankind.

However, oceans are under enormous pressure. There is strong scientific evidence of growing impacts on marine ecosystems. Ocean temperatures and acidification are increasing, degradation of coastal mangroves and coral reefs is threatening critical life support systems, habitats are being destroyed, nutrient runoff and toxic substances are causing serious pollution and the buildup of plastic waste in the oceans is a threat to many species and to human health.

Many of these challenges in the oceans are not caused by the seafood industry itself, but they all impact us directly and indirectly.

We acknowledge that the ocean is also directly affected by activities of wild capture fisheries, such as illegal, unreported and unregulated (IUU) fishing, bycatch, overfishing and modern slavery.

In the face of a growing and wealthier world population, the reliance on aquaculture as a crucial contributor to sustainable food production will increase. However, badly managed, aquaculture can have detrimental social and environmental impacts.

¹ <https://www.ourworldindata.org/seafood-production-revenue-and-volume-around-the-world>, accessed 10/10/2023. ² <https://www.ourworldindata.org/seafood-production-revenue-and-volume-around-the-world>, accessed 10/10/2023.

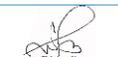
- Strengthen practices in responsible, high-quality best practices practices health management, including responsible fishery systems.
- Collaborate and invest in the development and deployment of emerging approaches and technologies for sustainable fisheries and aquaculture.
- Support rapid solutions and innovation for ocean stewardship.

The protection of the oceans to help provide healthy food for humankind requires the cooperation of all stakeholders. The health of the oceans will be secured by action, not inaction. And the response to the environmental and social challenges facing the oceans in the 21st century is clear: we must work together to ensure a sustainable future for all.

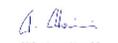
We request the endorsement of the resolution and the plan of action and will have the opportunity to work with the industry to ensure that the plan of action is implemented and the industry is held accountable for its actions.

2023. Stewardship best practices and healthy food production practice, of responsible production, aimed to implement endorsed the industry and sustainable production practices for ocean stewardship.

SIGNATURES


Shigeo Kato
President
Mitsui Bussan Kaisha, Ltd.


Michael Bennett
President
Mitsui Bussan Kaisha, Ltd.


A. Chinn
Chairman
Mitsui Bussan Kaisha, Ltd.


C. E. Smith
Chairman
Mitsui Bussan Kaisha, Ltd.


Tomoya
CEO
Mitsui Bussan Kaisha, Ltd.


Michael
CEO
Mitsui Bussan Kaisha, Ltd.

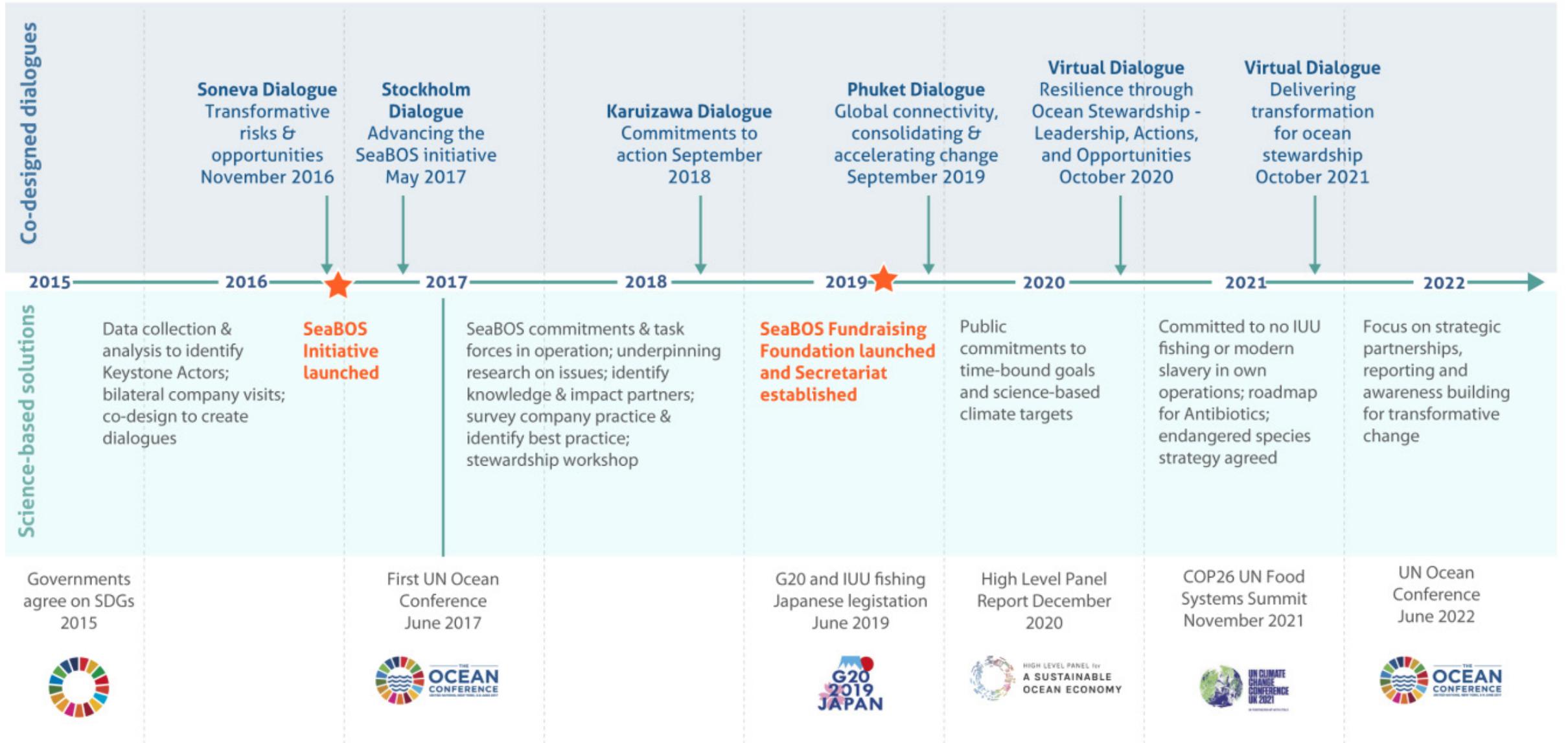

Emma
CEO
Mitsui Bussan Kaisha, Ltd.


C. M. Smith
CEO
Mitsui Bussan Kaisha, Ltd.

<http://keystonedialogues.earth/>

Can this process be condensed?

SeaBOS (ocean stewardship) timeline





Executive Programme in Resilience Thinking

- Launched in 2018
- Tailored to CEO & Chair persons of influential companies
- Three meet-ups, including a 3-day retreat
- Supports learning and collaboration to accelerate sustainability transformations



Johan Rockström
Welcome to the
Anthropocene



Kate Raworth
Doughnut
economics



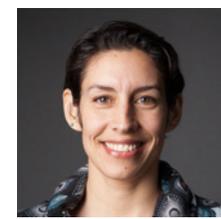
Carl Folke
Resilience
thinking



Line Gordon
Food futures



Per Olsson
Transformations



Beatrice Crona
Finance and the
biosphere



Lisen Schultz
Program director

90+ CEOs and chair persons trained since 2018

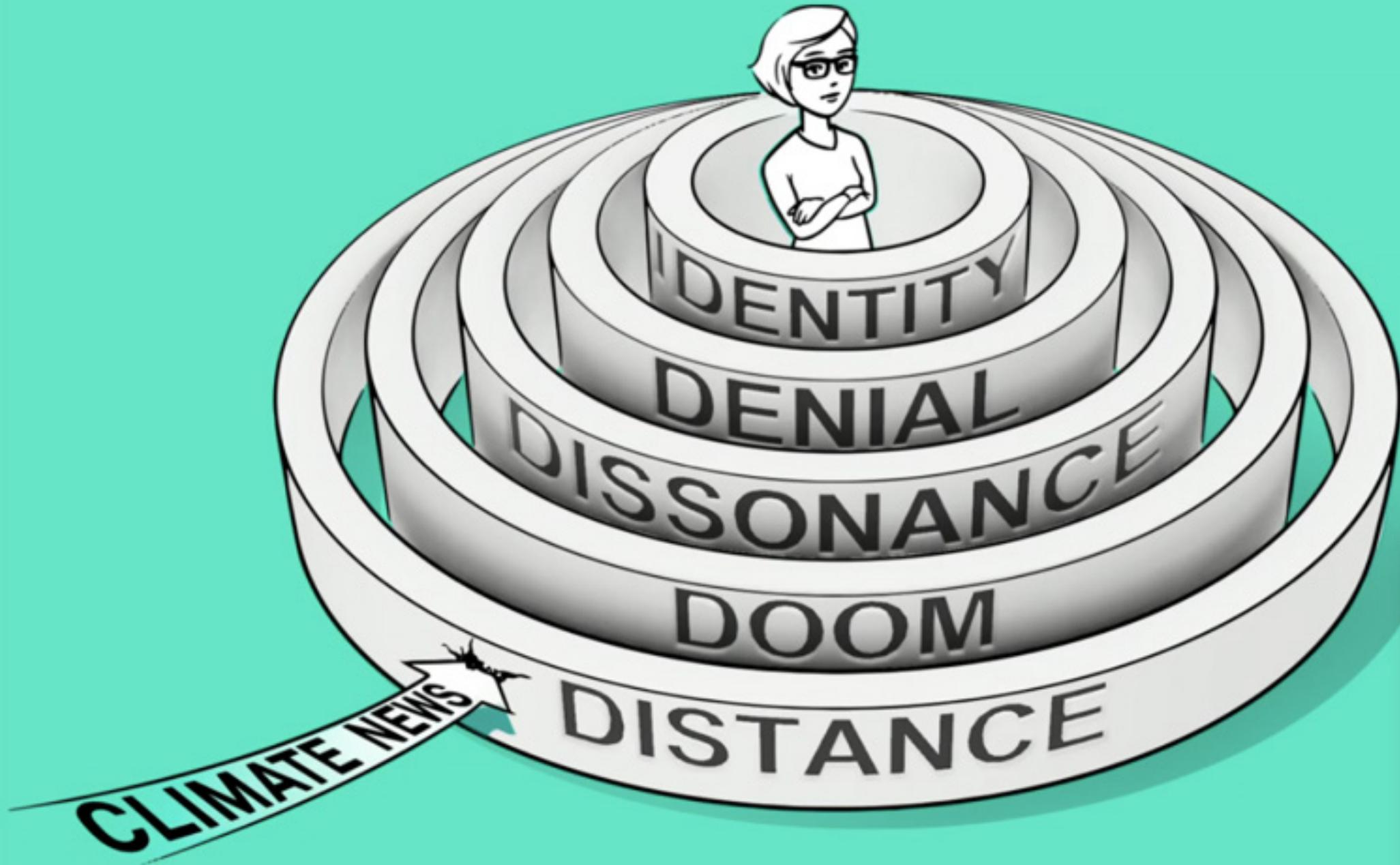
Addtech
Advania Group
Alecta
AMF Fastigheter
Apoteket
AP6
Atlas Copco
Axel Johnson
Axfood
Beijerstiftelsen
Blue Water Energy
Bona
Bravida
Clas Ohlson
Dagab
DNB Sverige
Dustin
Electrolux
Ernstströmgruppen
Epiroc
Fagerhult
FAM
Gränges Group

Gullspång invest
H&M
Handelsbanken
Handelsbanken fonder
Hemköp
HMS
Husqvarna
IK Partners
Industrivärden
Investor
Interflora
IPCO
John Mattson Fastigheter
Kicks
Kinnevik
KPA Pension
Latour investment
Lindéngruppen
Martin & Servera
Munters
NCC
Nefab
Nobel Prize Outreach

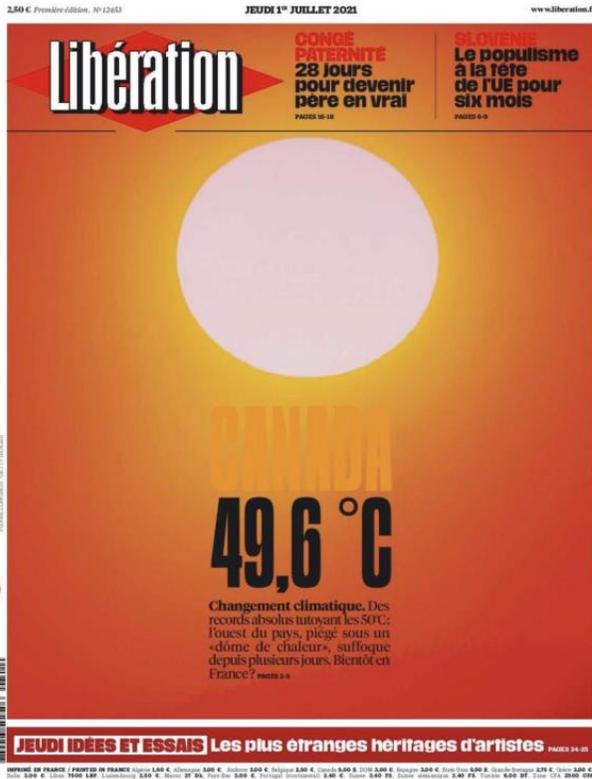
Nobia
NYK
OKQ8
Patricia industries
Postnord
Saab
Scania
SEB
Semcon
Sia Glass
Skanska
Slättö
Sonae Group
Stena Line
Stena Metall
Stena Recycling
Stora Enso
Swedbank
Systembolaget
Tempo
Volvo
Wärtsilä
XANO Industri



Addressing barriers to climate action



Addressing Distance: Consequences here and now



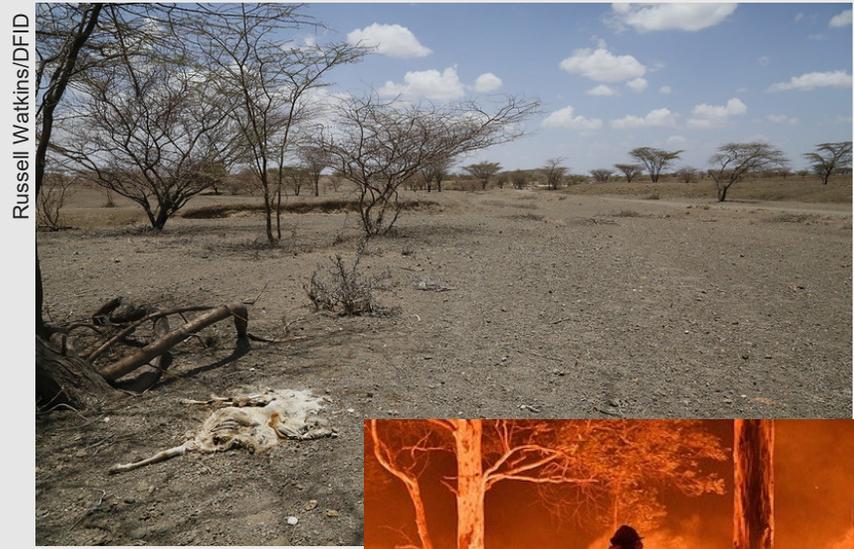
'Catastrophic' flooding hits western Germany leaving dozens dead - video report

'Catastrophic' flooding hits western Germany leaving dozens dead

FLER VIDEOR

0:06 / 1:38

Heavy rain and floods have caused the collapse of six houses in Germany's western state of Rhineland-Palatinate, leaving at least 38 people dead and many missing or stranded on rooftops. Two firemen drowned and the army was deployed to help stranded residents on Wednesday, after a slow-moving low-pressure weather system caused once-in-a-generation floods



Russell Watkins/DFID



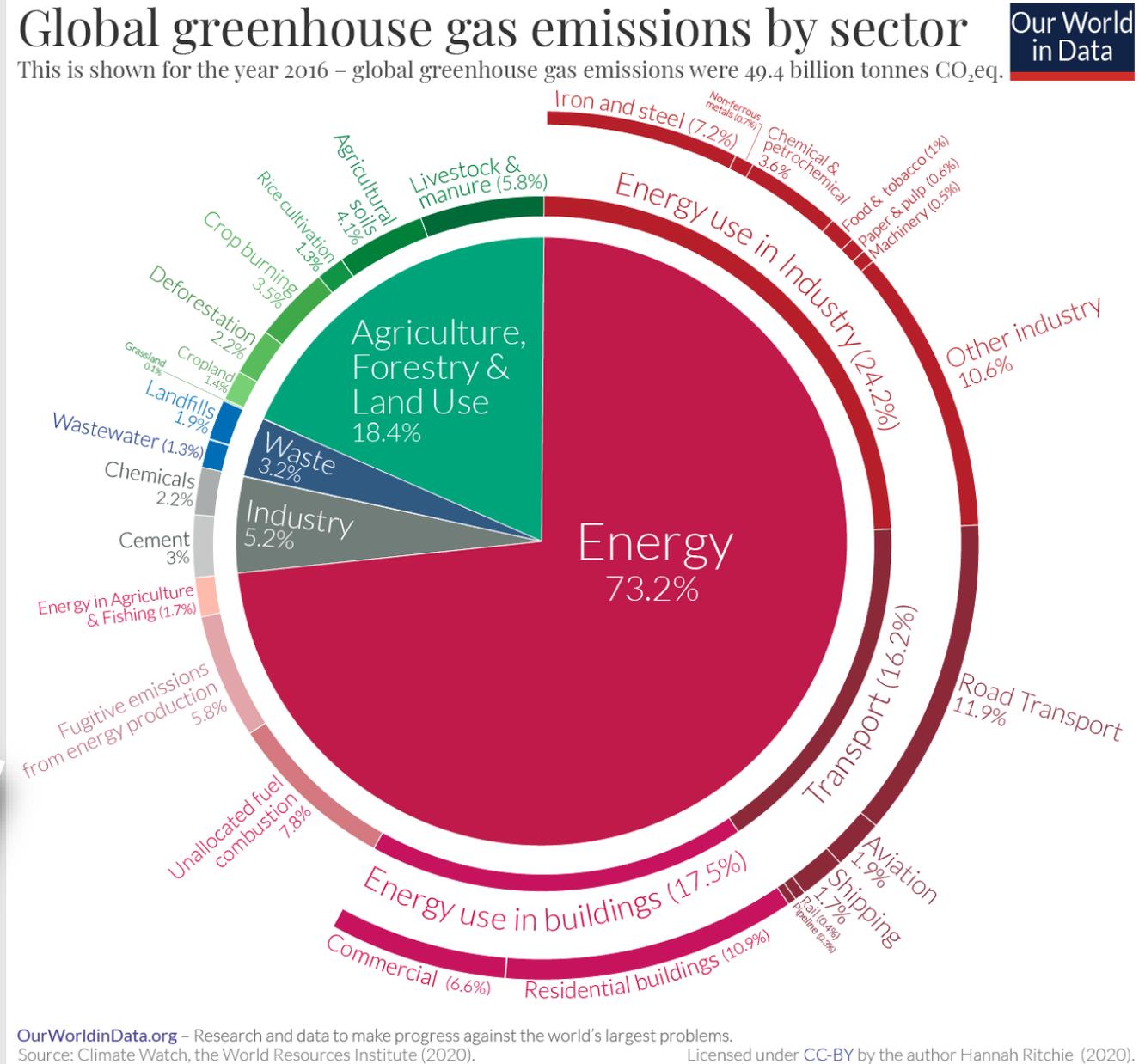
Ninian Rade

“Human-induced climate change, including more frequent and intense extreme events, has caused widespread adverse impacts and related losses and damages to nature and people, beyond natural climate variability (high confidence).” IPCC, 2022

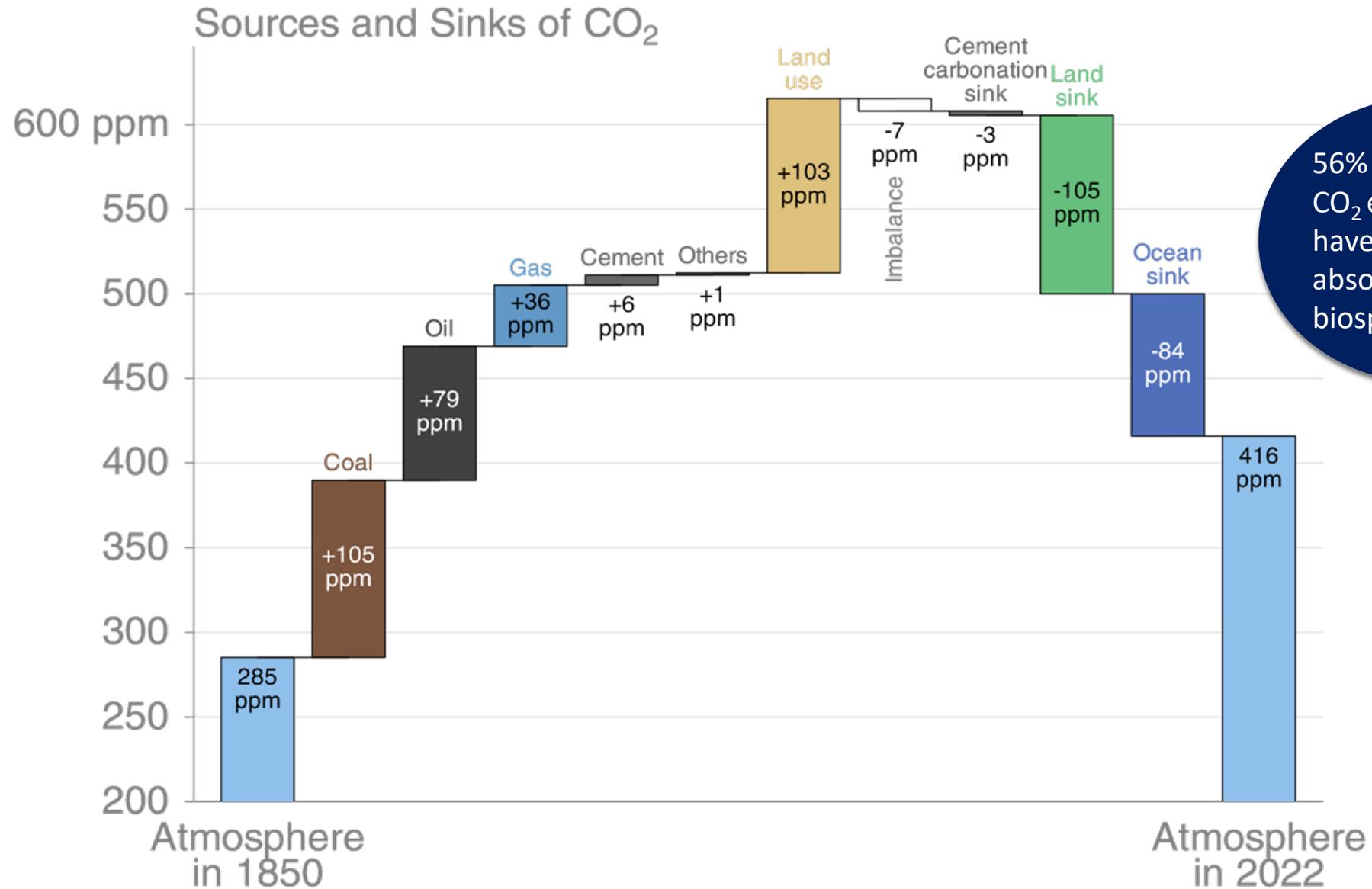
“157 of top 200 economic entities by revenue are corporations not countries”
Global Justice Now 2018

Addressing Doom: It is not too late, and we know what it takes

- From fossil fuels to renewable energy
- From a linear to a circular economy
- From exploitation to regeneration of nature and society

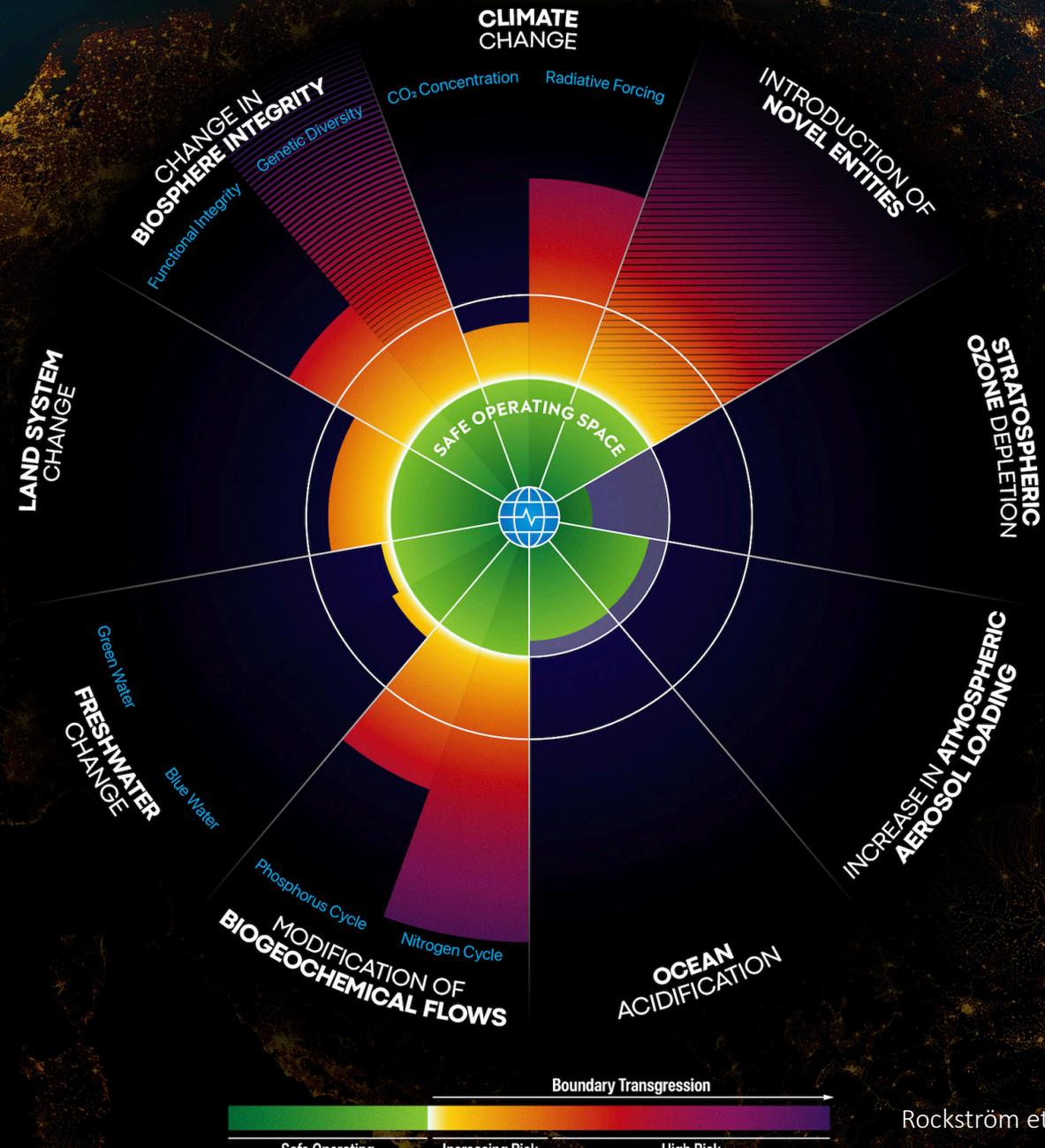


Bringing ecology to the centre

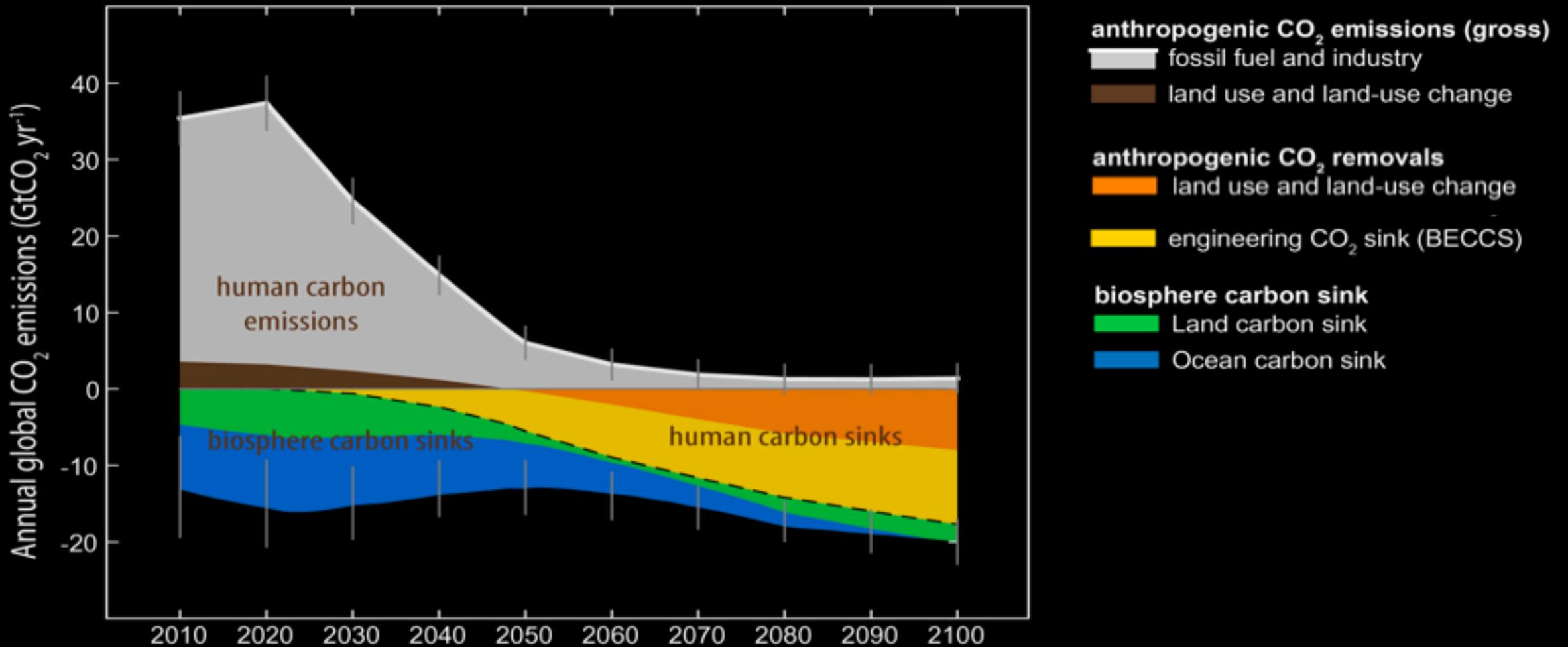


56% of human CO₂ emissions have been absorbed by the biosphere

Planetary boundaries for a safe operating space



A roadmap for rapid decarbonization, the “carbon law”



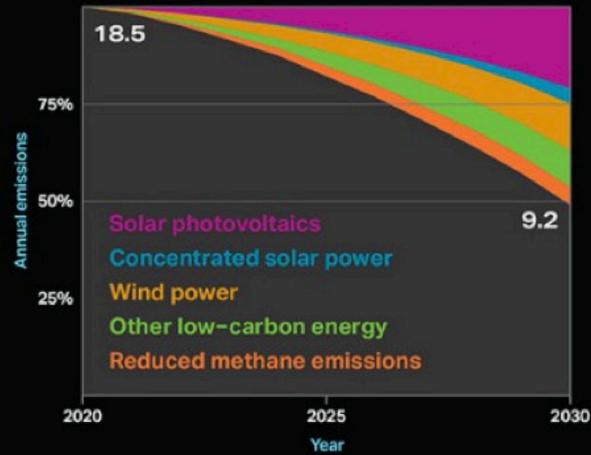
Addressing Dissonance: Solutions exist for the first halving

EXPONENTIAL ROADMAP

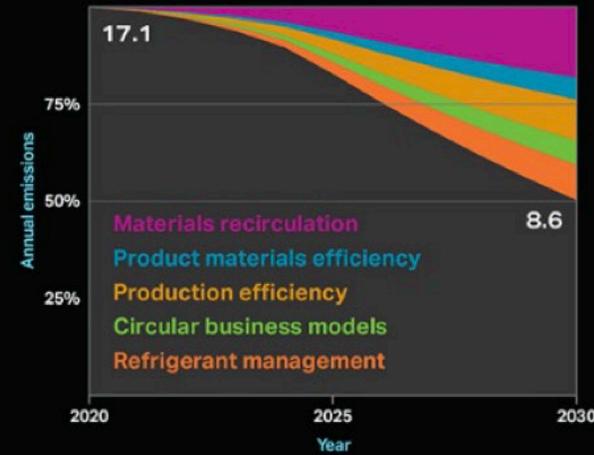
LET'S HALVE GLOBAL EMISSIONS BY

2030

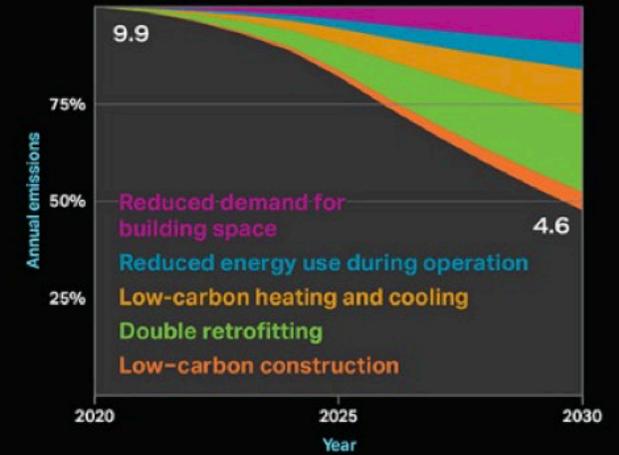
ENERGY SUPPLY



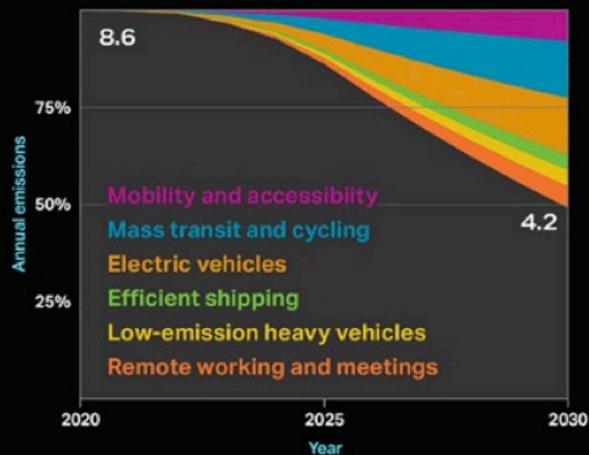
INDUSTRY



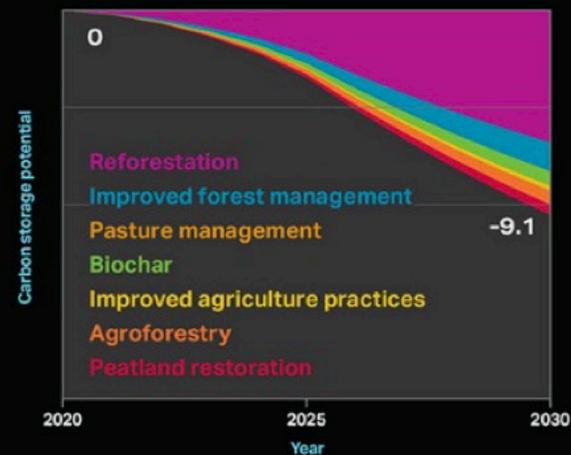
BUILDINGS



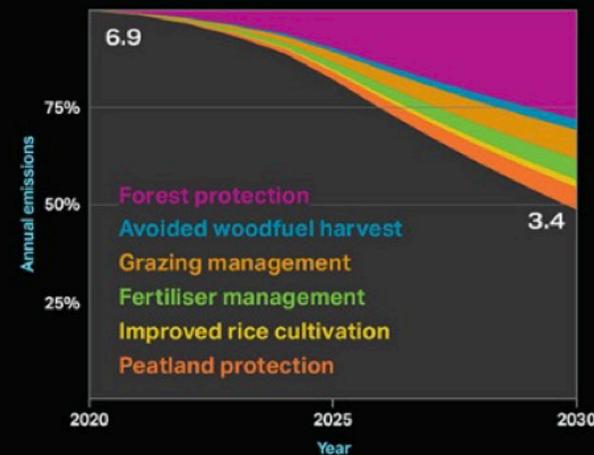
TRANSPORT



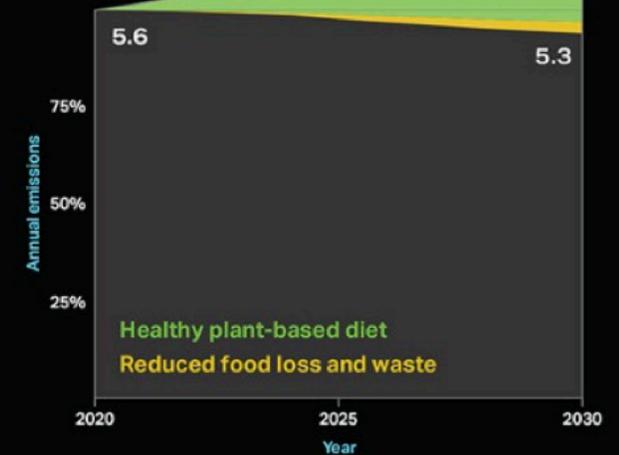
NATURE BASED SINKS



NATURE BASED SOURCES



FOOD CONSUMPTION



Addressing Denial: Co-production of knowledge

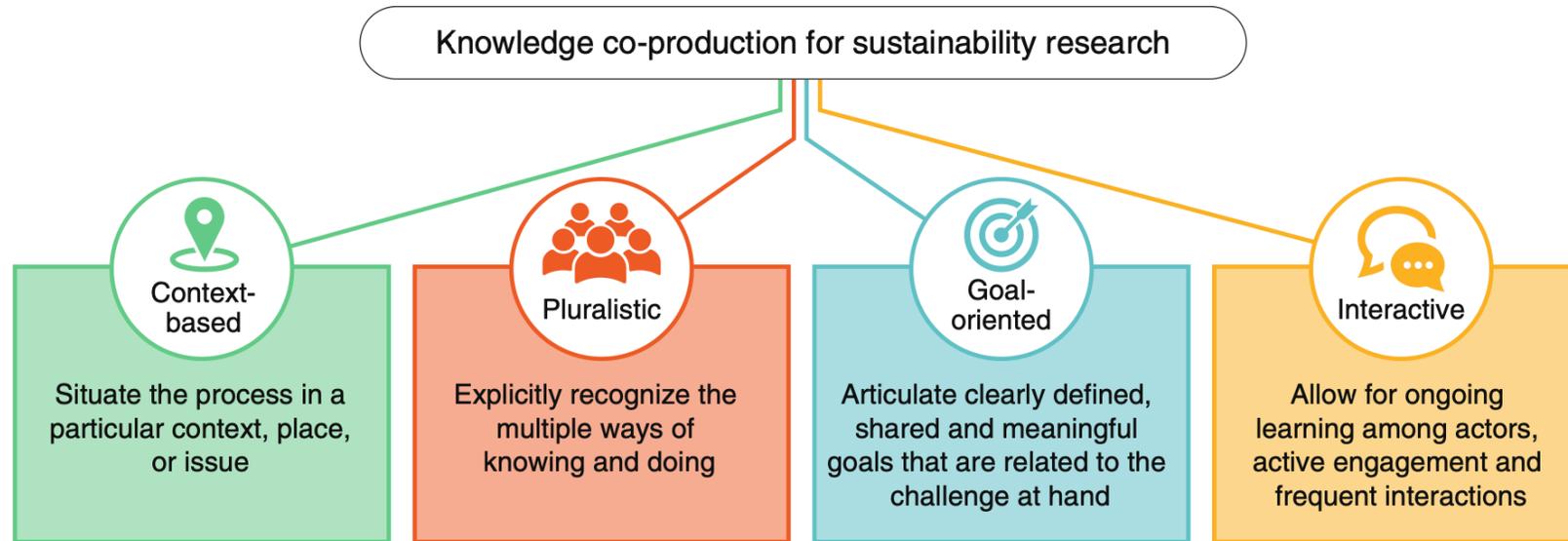


Fig. 1 | Principles for knowledge co-production in sustainability research. High-quality knowledge co-production for sustainability should be context-based, pluralistic, goal-oriented and interactive.

‘Iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future.’

Addressing Identity: Companies are stepping up to the challenge



DRIVING AMBITIOUS CORPORATE

SCIENCE



4264

science-
targets

7049

companies taking action

Reported effects of

- Boosts profitability
- Increases investment
- Drives innovation
- Reduces regulatory uncertainty
- Strengthens brand reputation



Next step: Executive programme for a just transition



34 presidents and secretaries engaged

All three central unions attending (LO, SACO, TCO)

Together, the participants represent 3.4 million swedes



FAIRTRANS ▶

Keys to success

- **Scientific assessments** need to be credible, salient and legitimate (Cash et al. 2003)
- **Adaptive co-management** succeeds through a shared vision, trust-building, engagement from knowledgeable and diverse actors, support from institutions and a bridging organisation (Armitage et al. 2008)
- **Keystone dialogues** are still in the experimental phase, but early results indicate that they have similar requirements as adaptive co-management – quality of both process and content is key (Österblom et al. 2022)

Summary

When seeking to inform decisions, it is important to consider

- **whose** decisions matter
- **what** information matters to those decisions
- **how** that information can be brought to decision-makers' attention

Scientific assessments, adaptive co-management, and keystone dialogues can all facilitate decisions informed by ecological knowledge, and they each come with a set of challenges, opportunities, and keys to success.



Thank you!
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