Nature Futures

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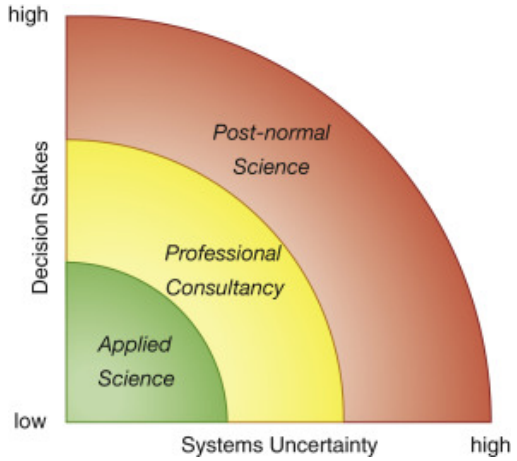
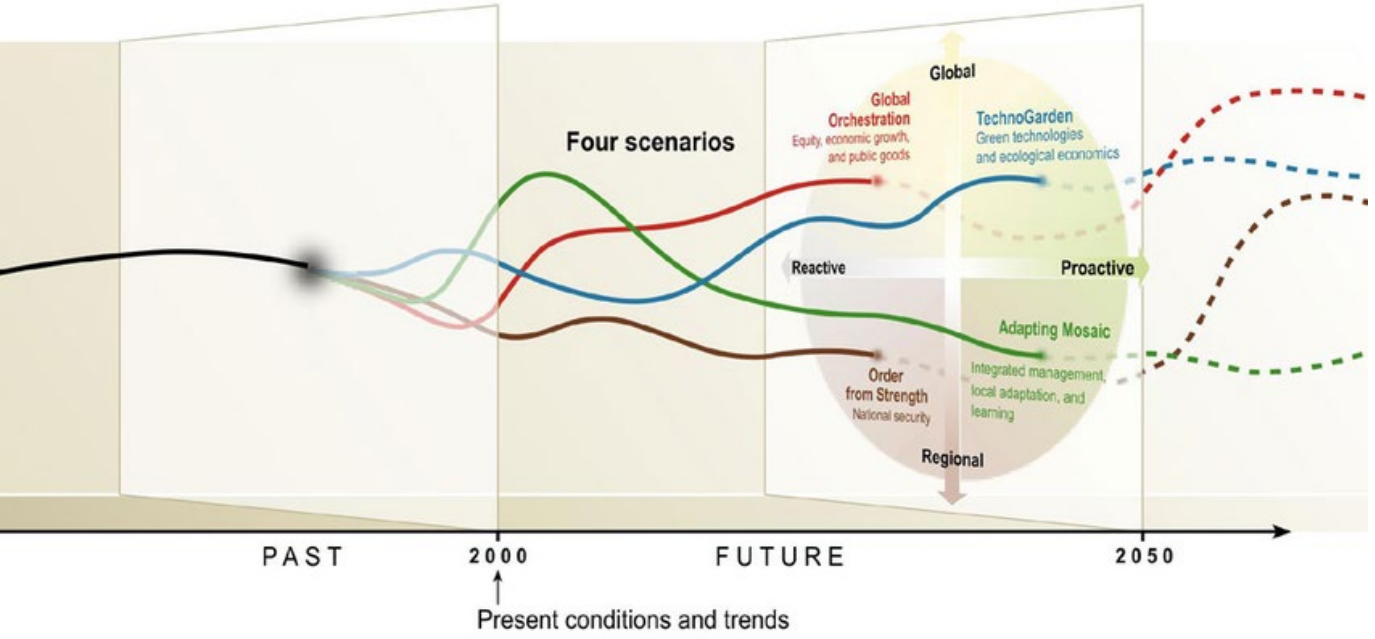
My 30 year history of thinking about Sustainable Futures

UNIVERSITY OF WATERLOO





Nature Futures

Intergovernmental Platform on Biodiversity & Ecosystem Services

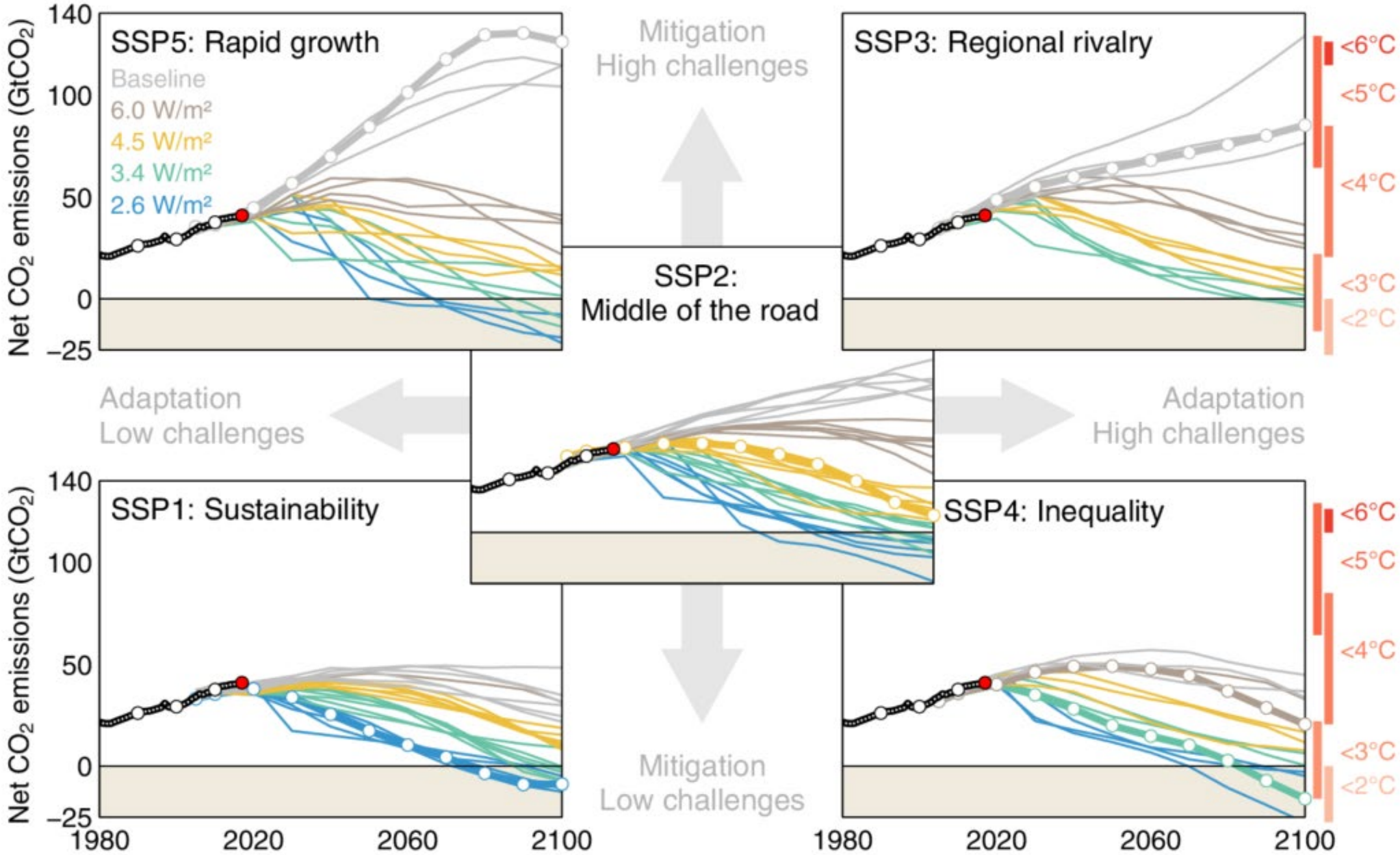
ipbes

Science and Policy for People and Nature

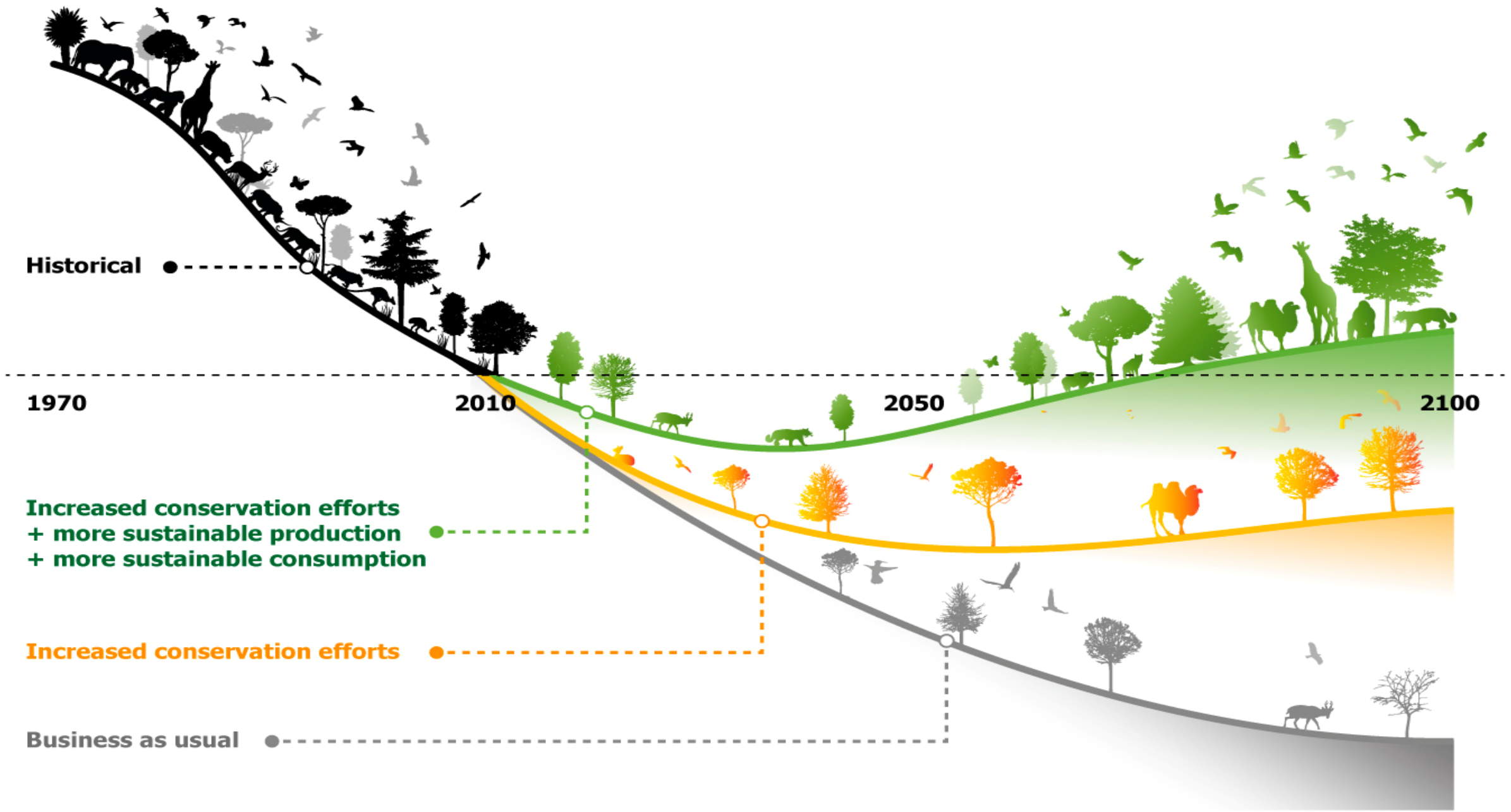
Economic activity is unravelling web of life

that supports human life & economic activity

Photo: Mattias Klum



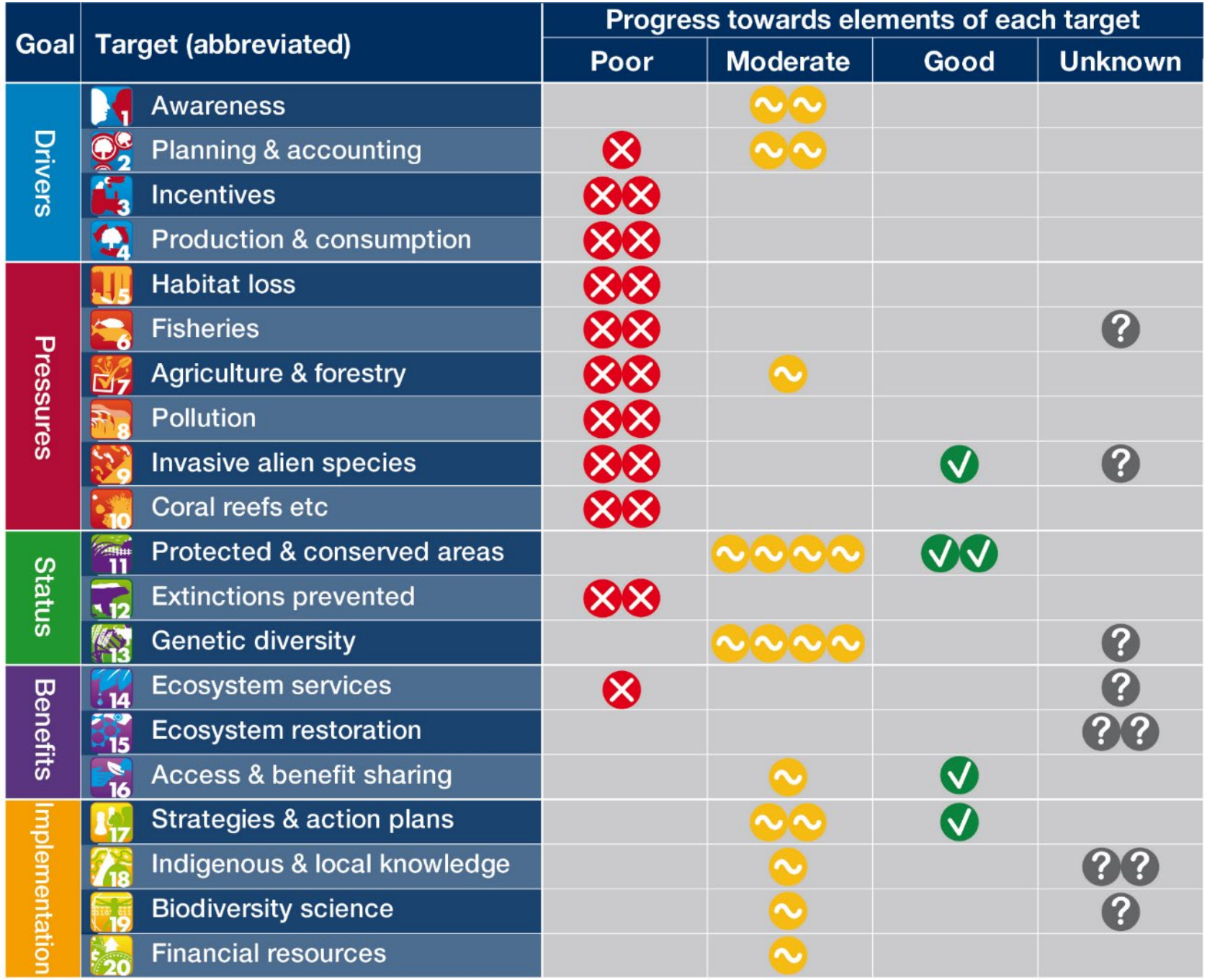
Millennium Ecosystem Assessment Scenarios



This artwork illustrates the main findings of the article, but does not intend to accurately represent its results (https://doi.org/10.1038/s41586-020-2705-y)

Leclere D, Obersteiner M, Barrett M, Butchart SHM, Chaudhary A, De Palma A, DeClerck FAJ, Di Marco M, et al. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. Nature DOI: 10.1038/s41586-020-2705-y


CBD
THE POST 2020
GLOBAL BIODIVERSITY FRAMEWORK
Living in harmony with nature by 2050



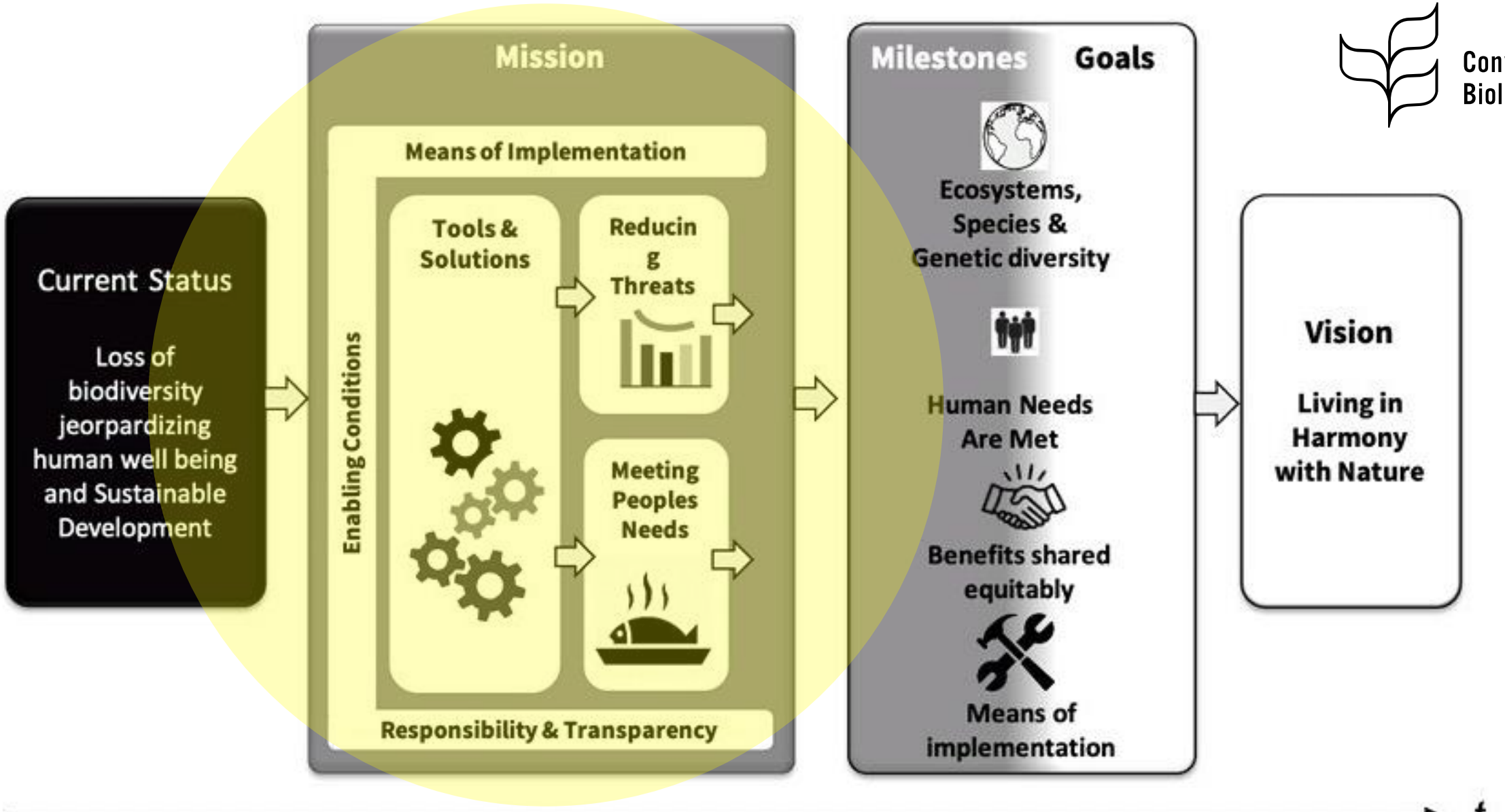
Via Convention on Biological Diversity the world's governments agreed to a strategic plan in 2011 with targets to meet by 2020

Not a good track record

Failure to achieve Aichi Biodiversity Targets

(IPBES Global Assess 2021)

Figure 1. Theory of change of the framework



Nature Futures

IPBES Task Force

to catalyse development of scenarios & models of biodiversity & ecosystem services

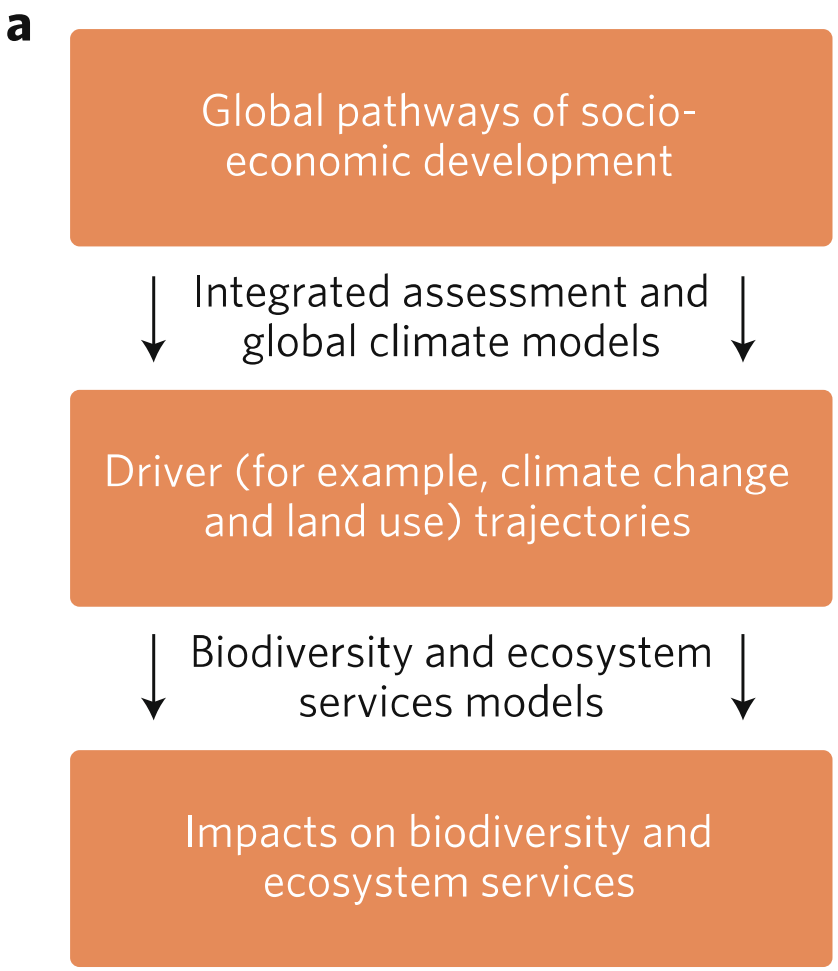
2016

Intergovernmental Platform on Biodiversity & Ecosystem Services

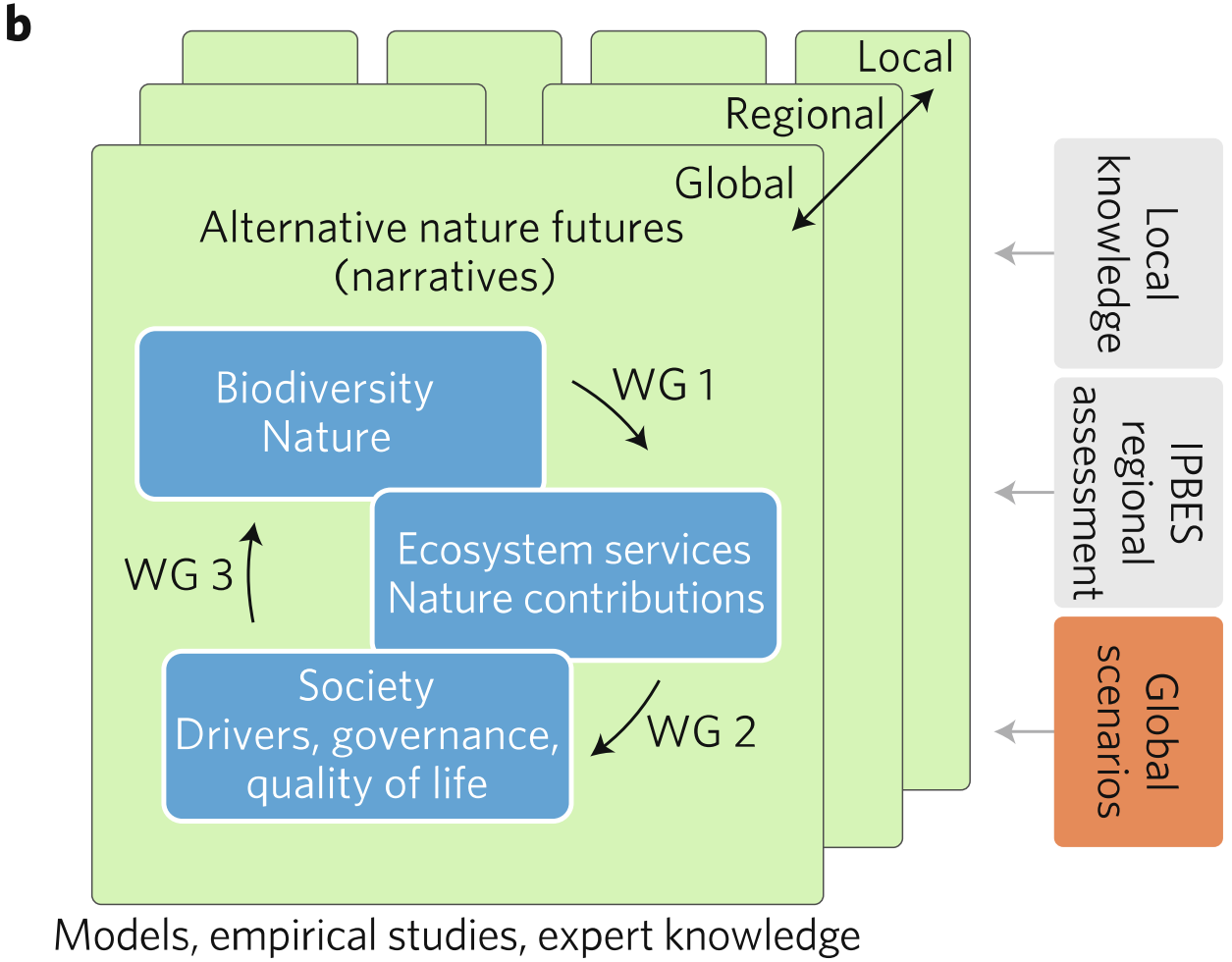
ipbes

Science and Policy for People and Nature

IPCC + MA



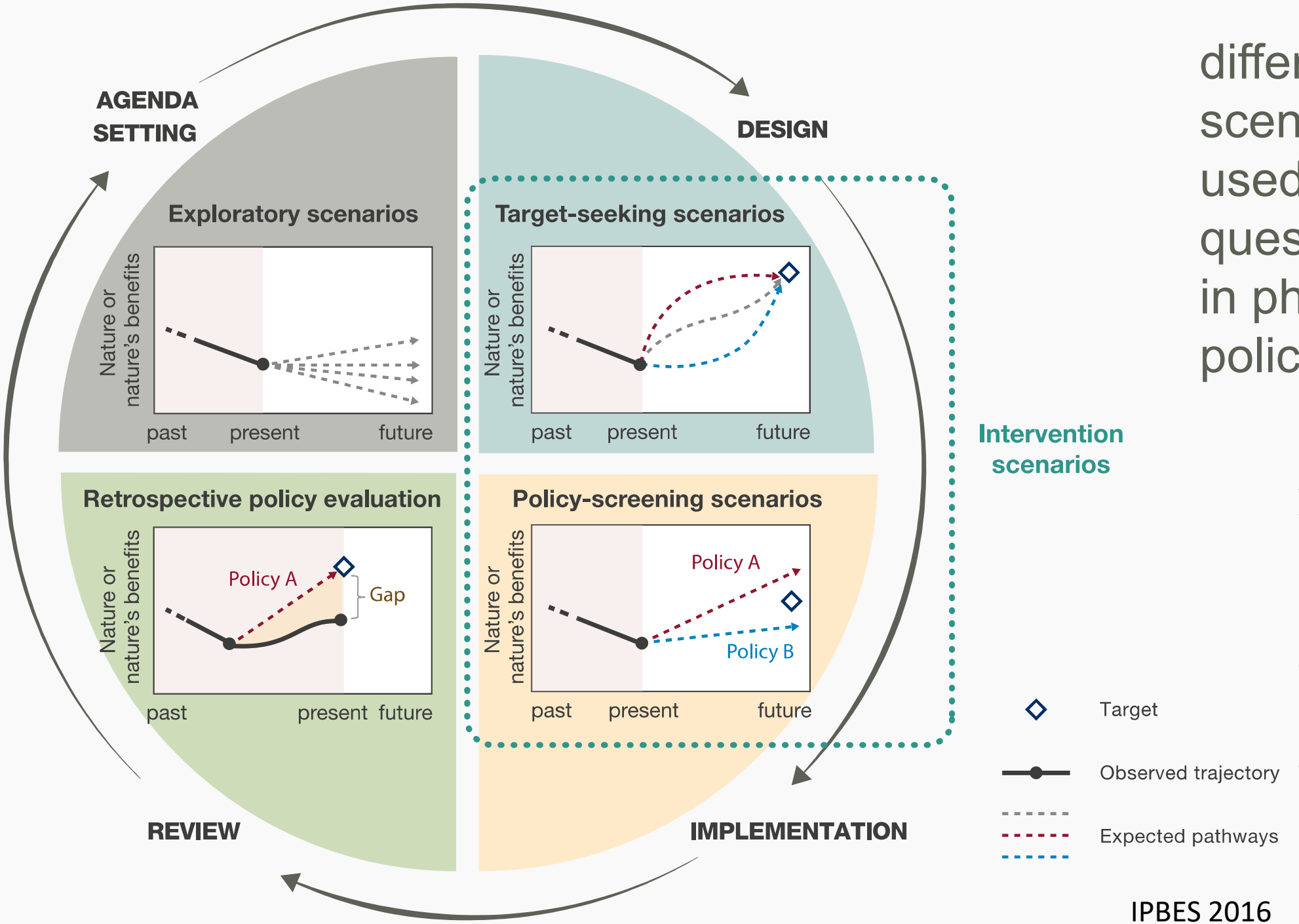
IPBES



Drivers -> Nature vs. Visions & feedbacks

Rosa, I.M.D *et al.* Multiscale scenarios for nature futures. *Nat Ecol Evol* **1**, 1416–1419 (2017). https://doi.org/10.1038/s41559-017-

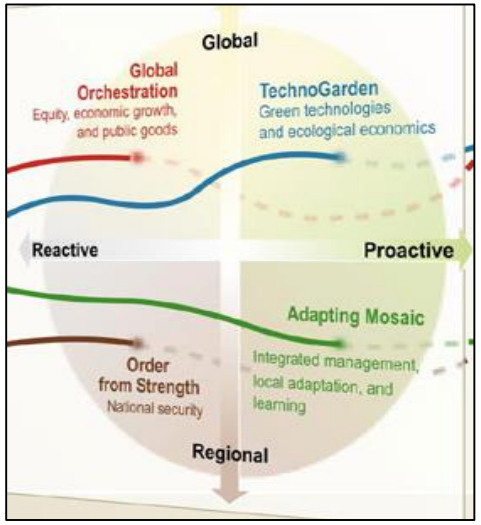
different types of scenarios can be used to address questions faced in phases of the policy cycle



IPBES 2016

Examples of scenario types

Exploratory



Millennium Ecosystem Assessment Scenarios explore the future of ecosystems and human well-being

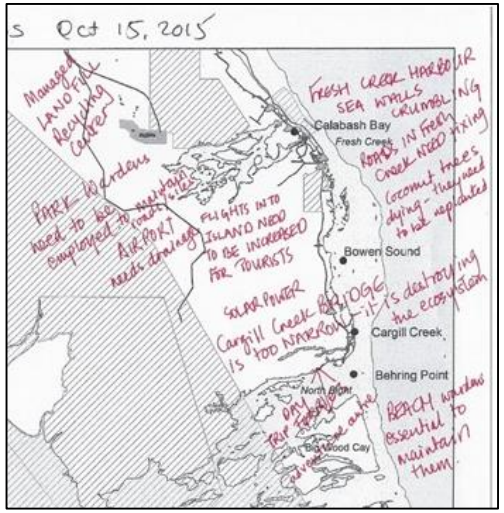
MA 2006

Target-Seeking

MISTRA Food Futures
4 pathways to achieving Sweden's biodiversity, health & climate goals for Swedish food system

Gordon et al 2022

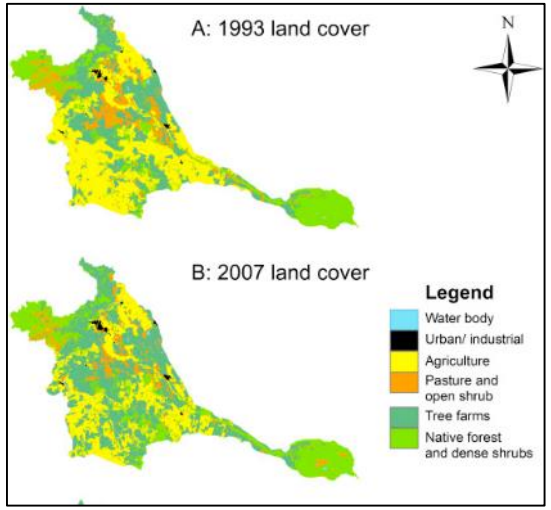
Policy Screening



Natural Capital scenarios to evaluate alternative development strategies in The Bahamas

Wyatt et al 2021

Retrospective



Retrospectively evaluating alternative policy for conservation of native forests in south-central Chile

Manuschevich et al 2016

What is “nature” & what is “harmony”

Multiple discourses

-> Nature’s right to exist for itself

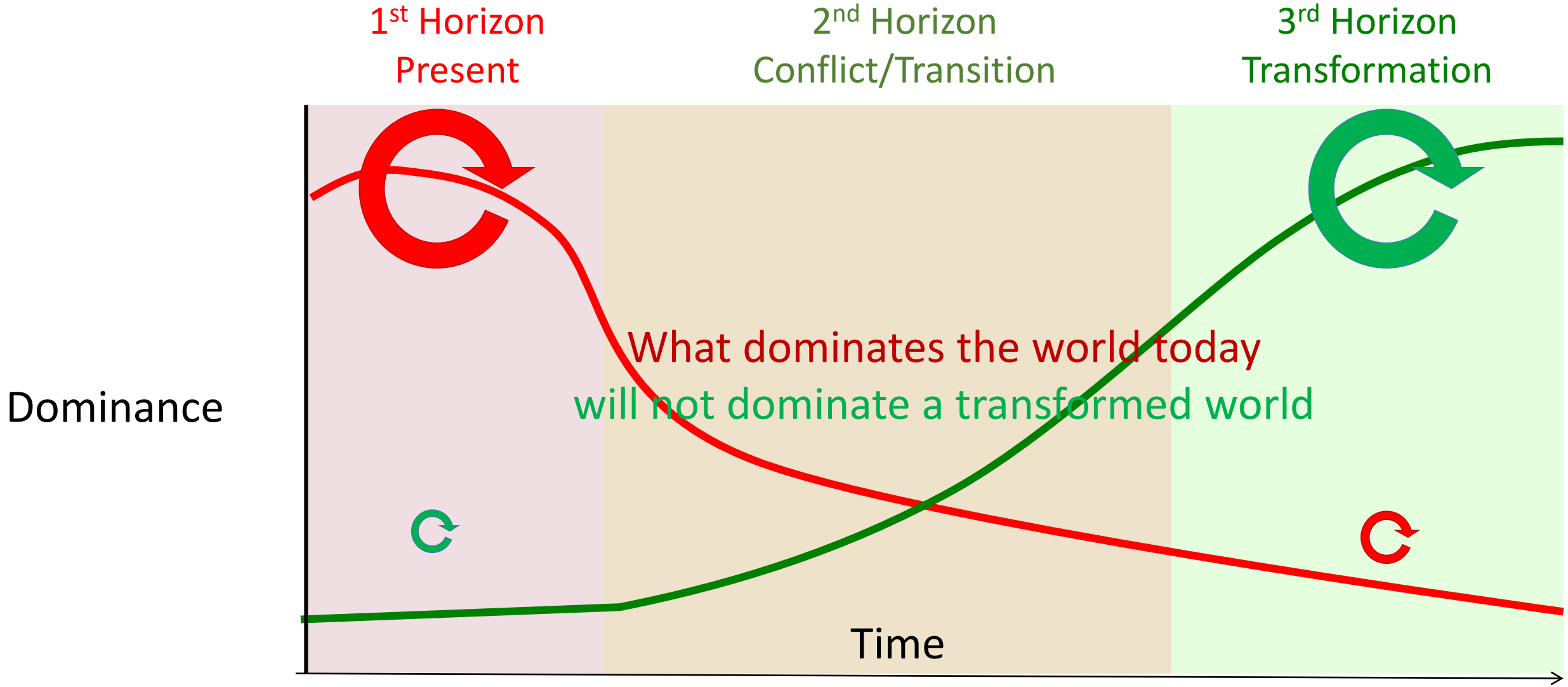
-> Efficient and Sustainable use

-> Pachamama - Mother Earth

Need to embrace pluralism & include multiple value perspectives

IPBES global assessment concluded:

"Pervasive human-driven decline of life on Earth points to the need for transformative change"
– Diaz et al Science 2019



What grows? What has to die? Where are there tensions?

“Seeds”

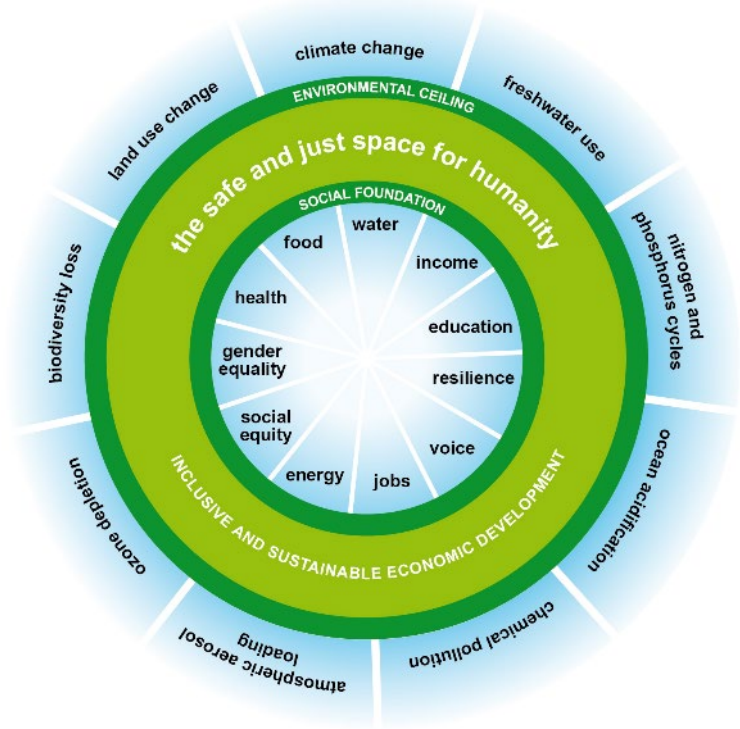
People - nature
social-ecological focus

A way of thinking, doing, institution, technology

Exists (at least as prototype)

Marginal (not yet dominant/mainstream)

Contribute to creating a sustainable future (according to someone)



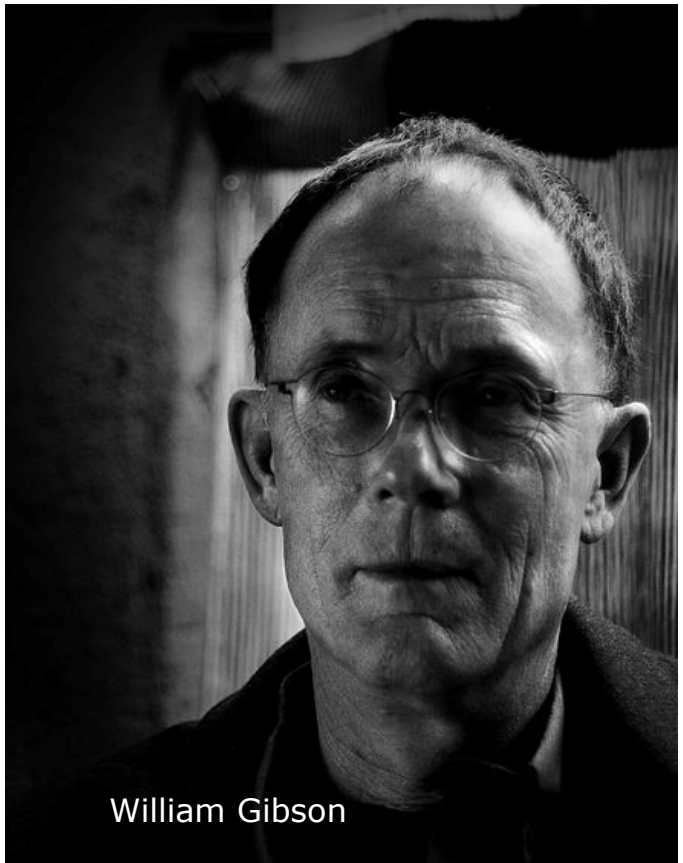
Why Seeds?

Pluralism

Ostrom's Law "A resource arrangement that works in practice can work in theory."

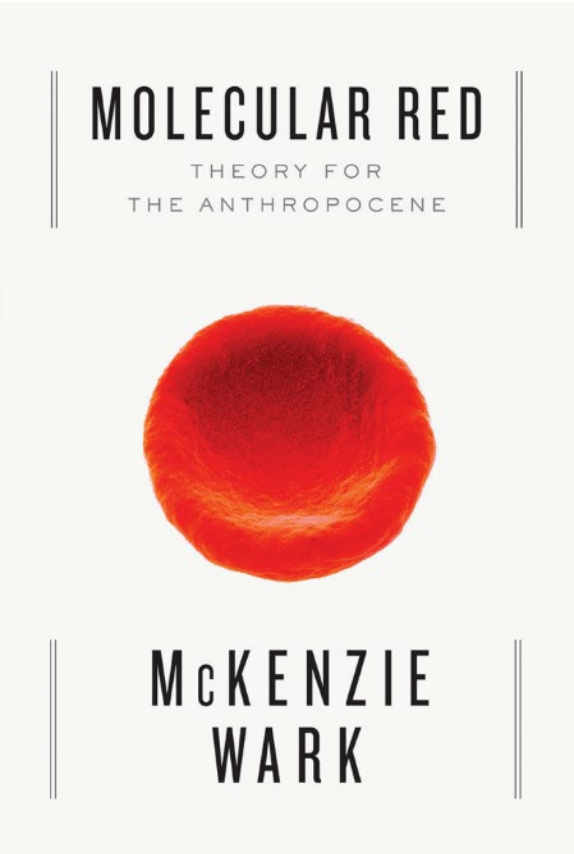
Novelty

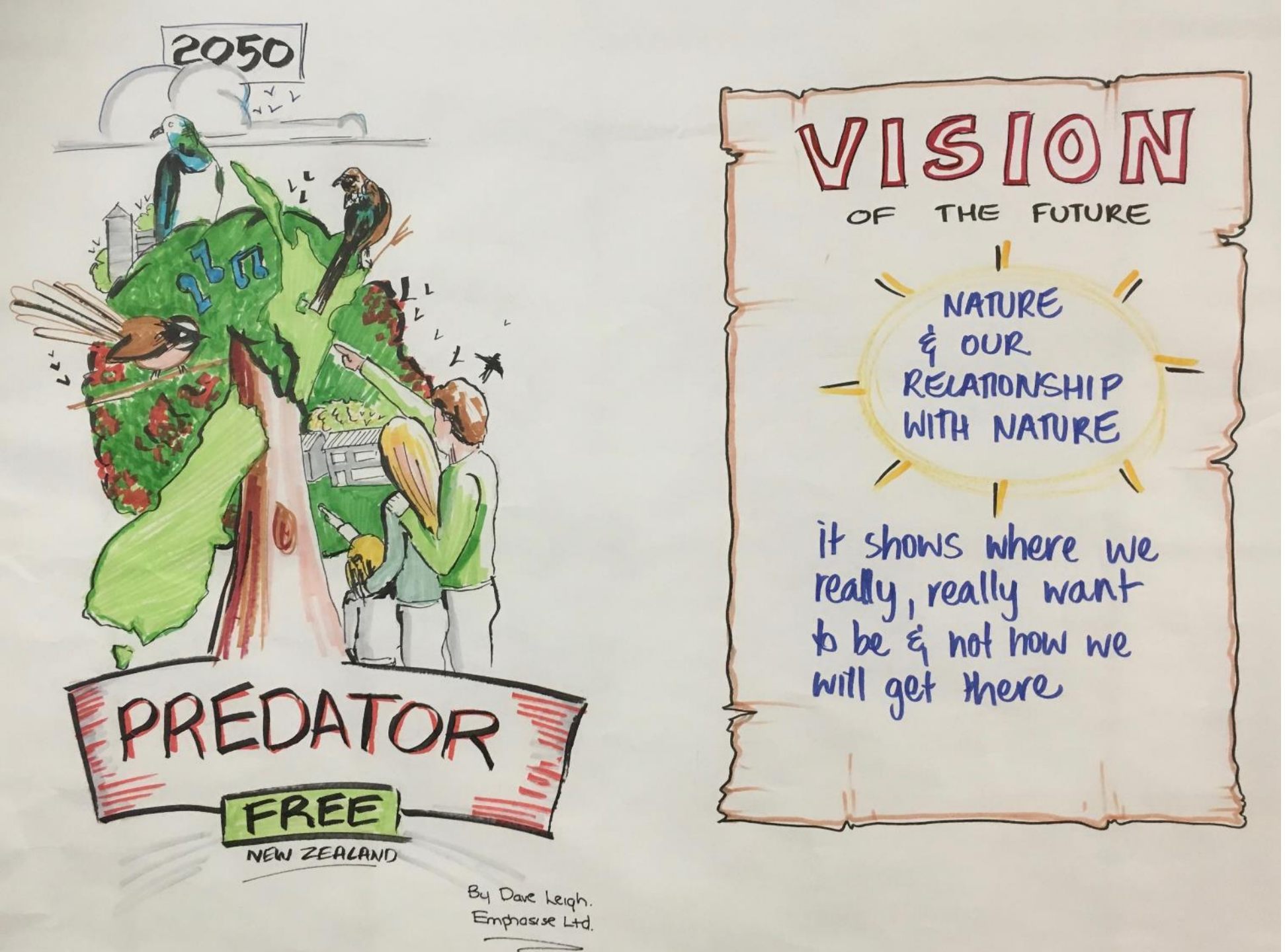
"The future is already here – it's just not evenly distributed"



Radicalism

"we need new ancestors. The old ones, in art and theory, have been exhausted and are exhausting us"





Values

Nature

Harmony


Dancing with Nature
an Evolutionary Stage
LESS INTERVENTN
ONGOING CONSTANT EXPERIMENTATION
PEOPLE CHANGING MINDS
BRING PPLE CLOSER TO NATURE
↑ RESPECT
Dynamic Reserves
People in vs people apart from nature?
Conflicts of animals with people & farming + cities
SPACE AND TIME FOR NATURE
Green infrastructure that enables plants, animals
HIGHER BIODIVERSITY
Biomass
People changing their livelihood practices (may be +ve or -ve)
People see nature more often in daily life
Less in-breeding (= greater resilience)
more consideration of : connectedness
SPATIAL
Freer Movement of People & Migrants
REWILDING
Increased protected area network
HOLISTIC THINKING
Restoring Megafauna for Rewilding
Assisted migrations
Dynamic Networks of
Social Conflict over Gene Modificat
Evolutionary Stage
Undermined by Gene Engineering
Tension btw
Institutions to Govern Gene Modificatn
Extinction of some species
Emerging & Novel Diseases
Whose Choice of Adaptive Capacity
Power/Wealth Inequality
SEPERATING HUMANS FR. NATURE
Social ethical acceptance(?) (behavioural Δ)
Reverse extinction
Restore Ecosystem Fn Charismatic Megafauna
: love Wilderness Friendly Domestic Ecosystems
Allowing Connect & Change
high investment : monitoring
Engineered Nature
↑ adaptive capacity of the spp we want
Potential increase in food security
Designer
targetted
Having deeper connections
Novel Crops

in our groups, we identified 3 SEEDS

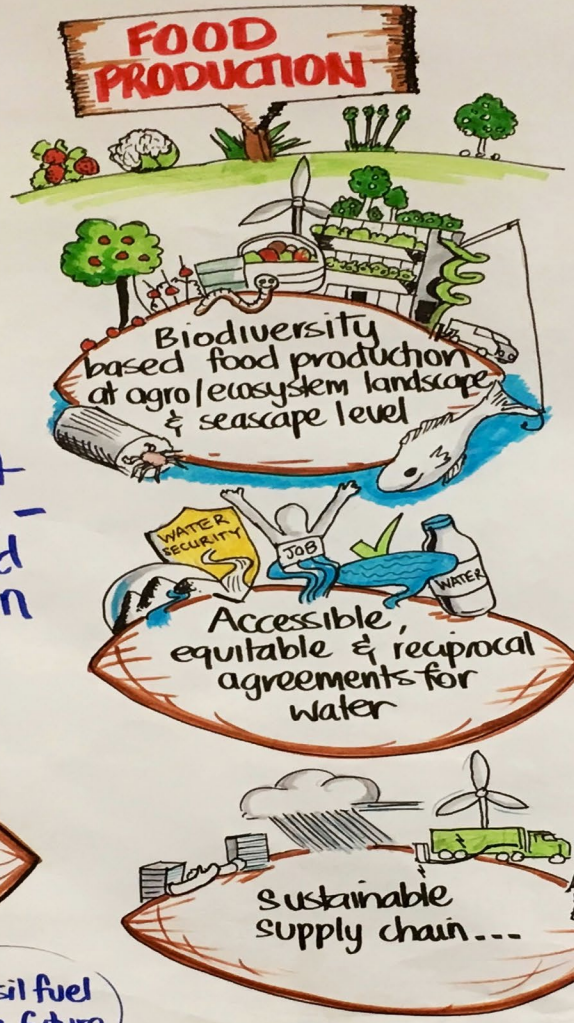
that can contribute to our thematic area

SEEDS

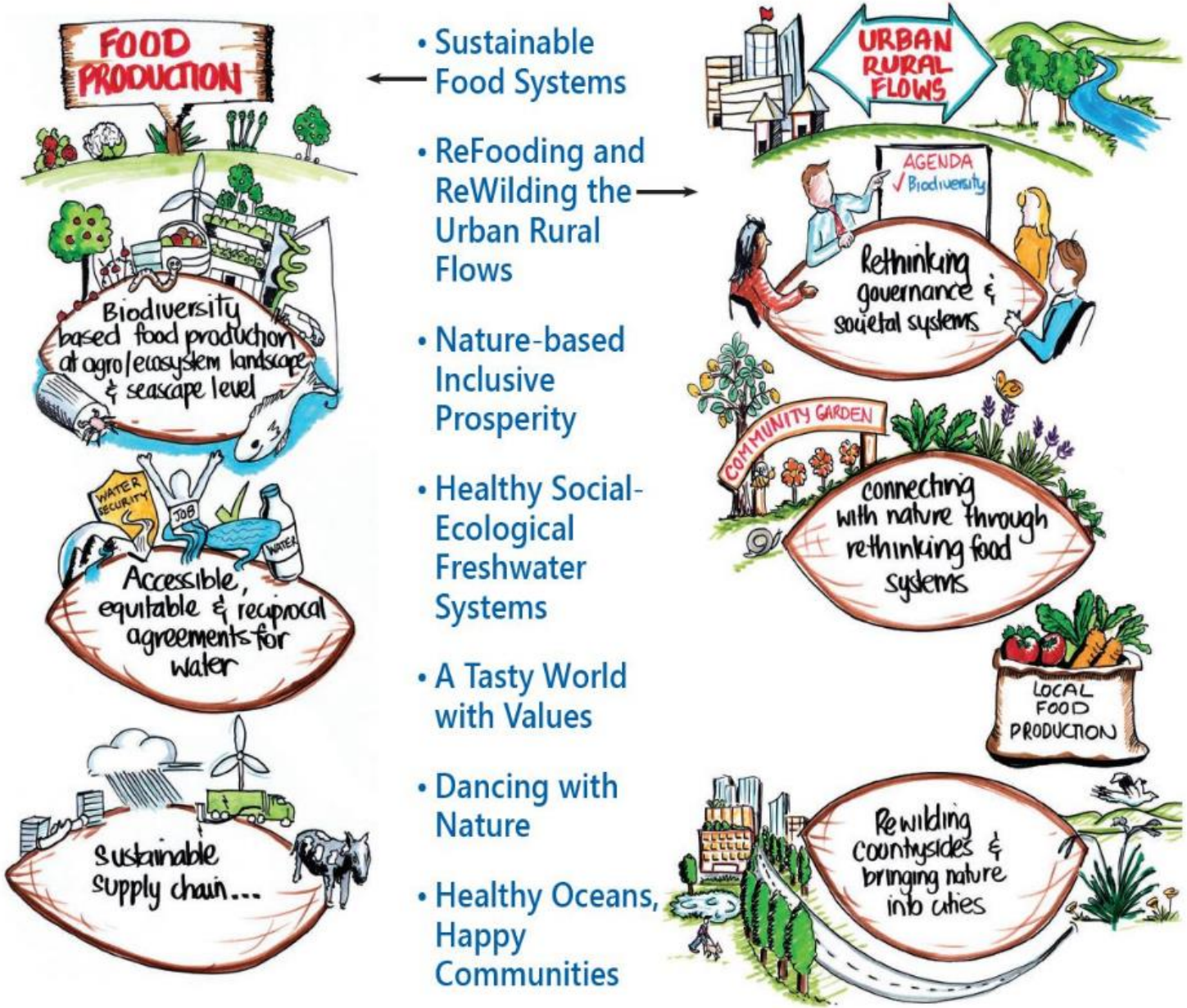
exist now but are marginal – not widespread or well known

EXAMPLES:

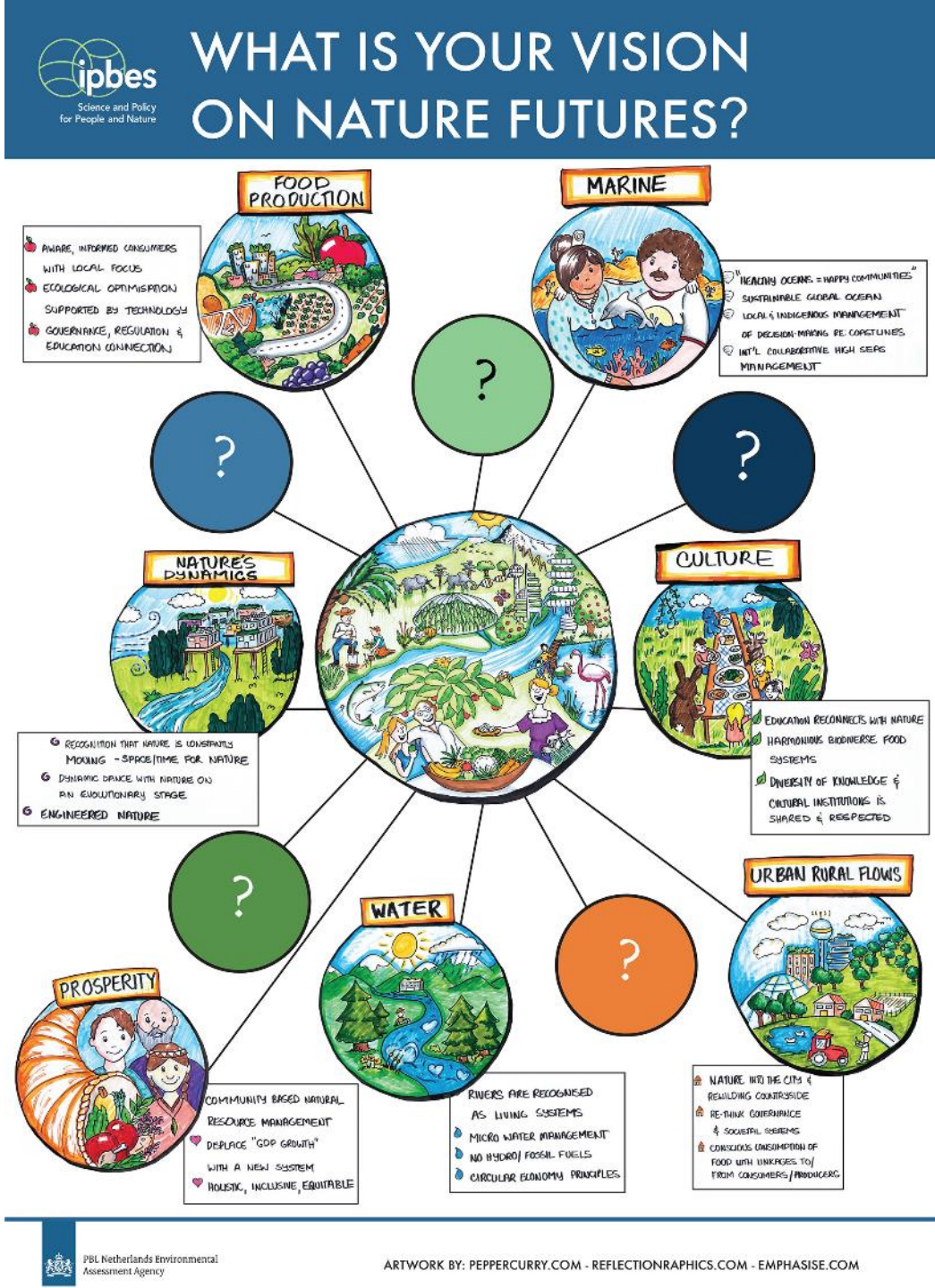
- successful re wilding initiatives
- ♀ farmers creating network with consumers
- structuring agriculture so it's attractive to farmers
- 3D aquaculture
- 4D printing
- fossil fuel free future
- car sharing



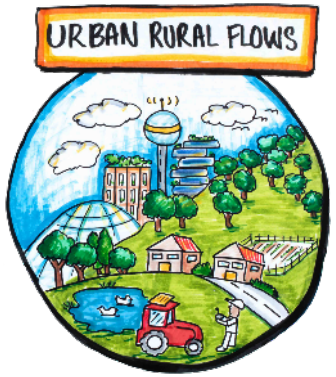
From Seeds to Visions



- Sustainable Food Systems
- ReFooding and ReWilding the Urban Rural Flows
- Nature-based Inclusive Prosperity
- Healthy Social-Ecological Freshwater Systems
- A Tasty World with Values
- Dancing with Nature
- Healthy Oceans, Happy Communities



How to usefully organize visions vs. alternative social-ecological perspectives



Sacred Spaces

Management

Relational Values

Rights of Nature

Institutions

Intrinsic Values

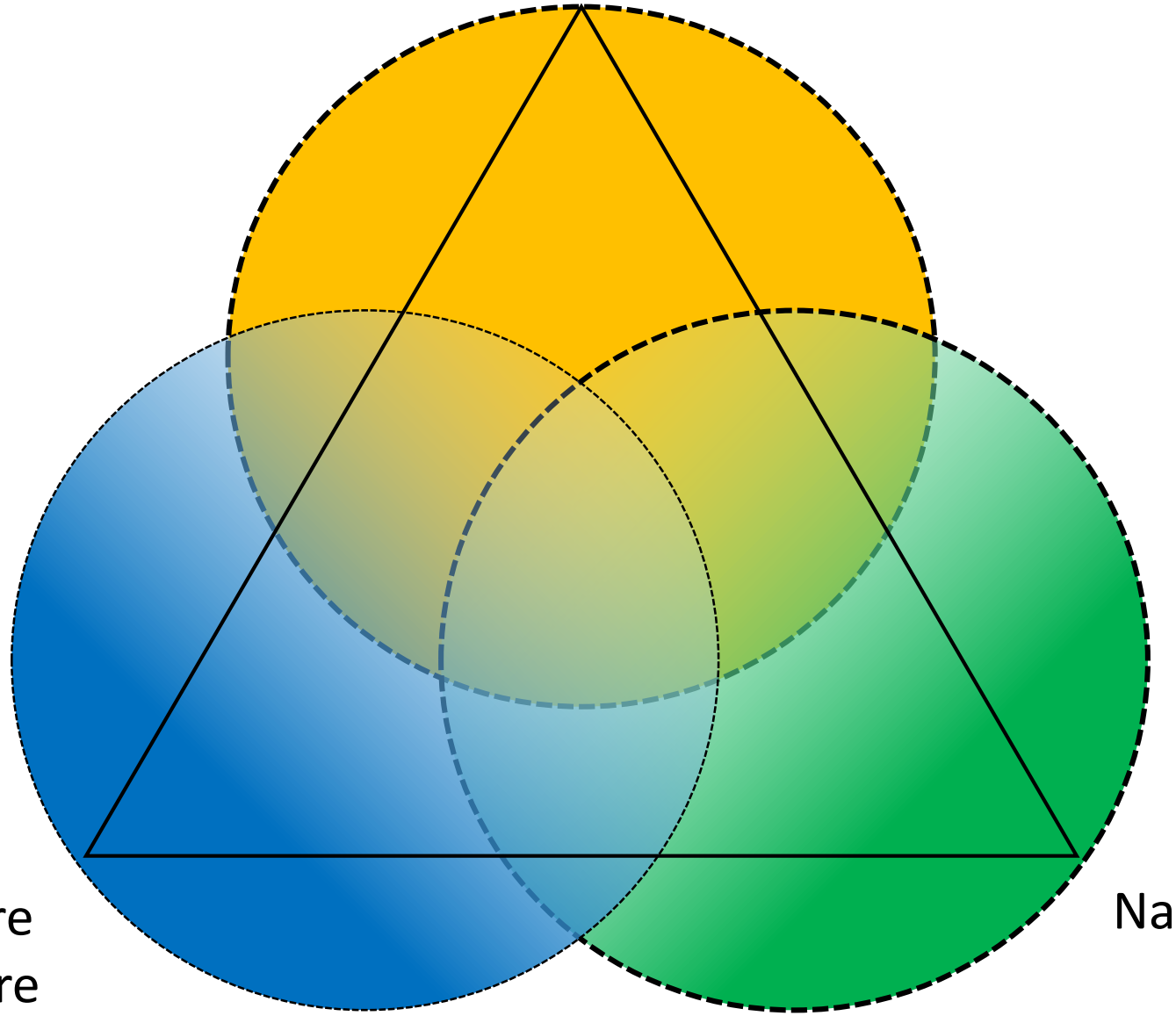
Property Rights

Technology

Instrumental Values

Nature Futures Framework

Nature for Nature
Intrinsic value of nature
Nature autonomous



Nature as Culture
People part of nature
Nature part of culture

Nature for Society
Nature's benefits to society
Ecosystem services

Moving towards a Pluralistic approach to valuation

Addresses key policy relevant perspectives on human-nature relationships

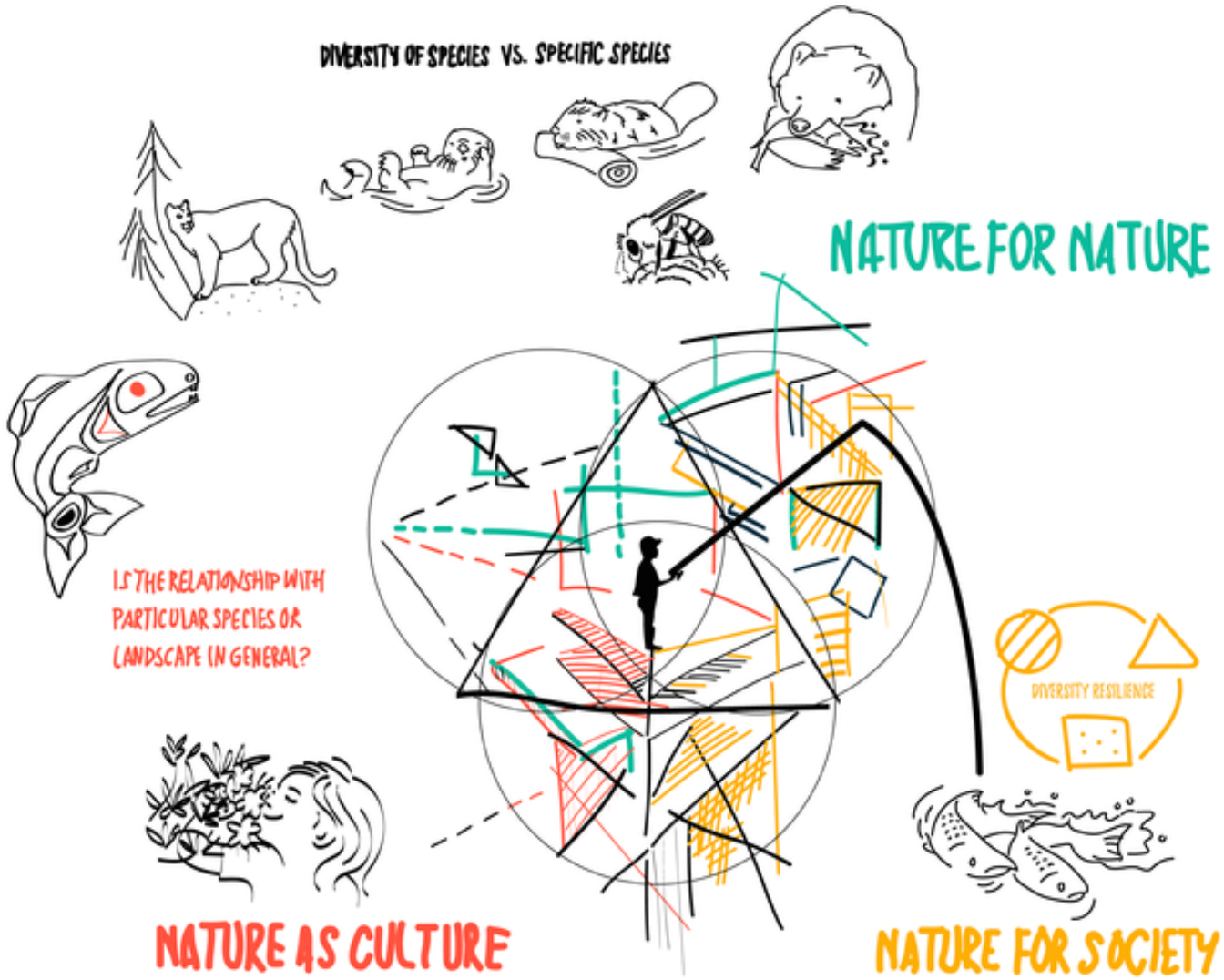
Elaborating Nature Futures

Monitoring

Translating

New Pluralistic Positive Nature Futures

Adapting & Developing New

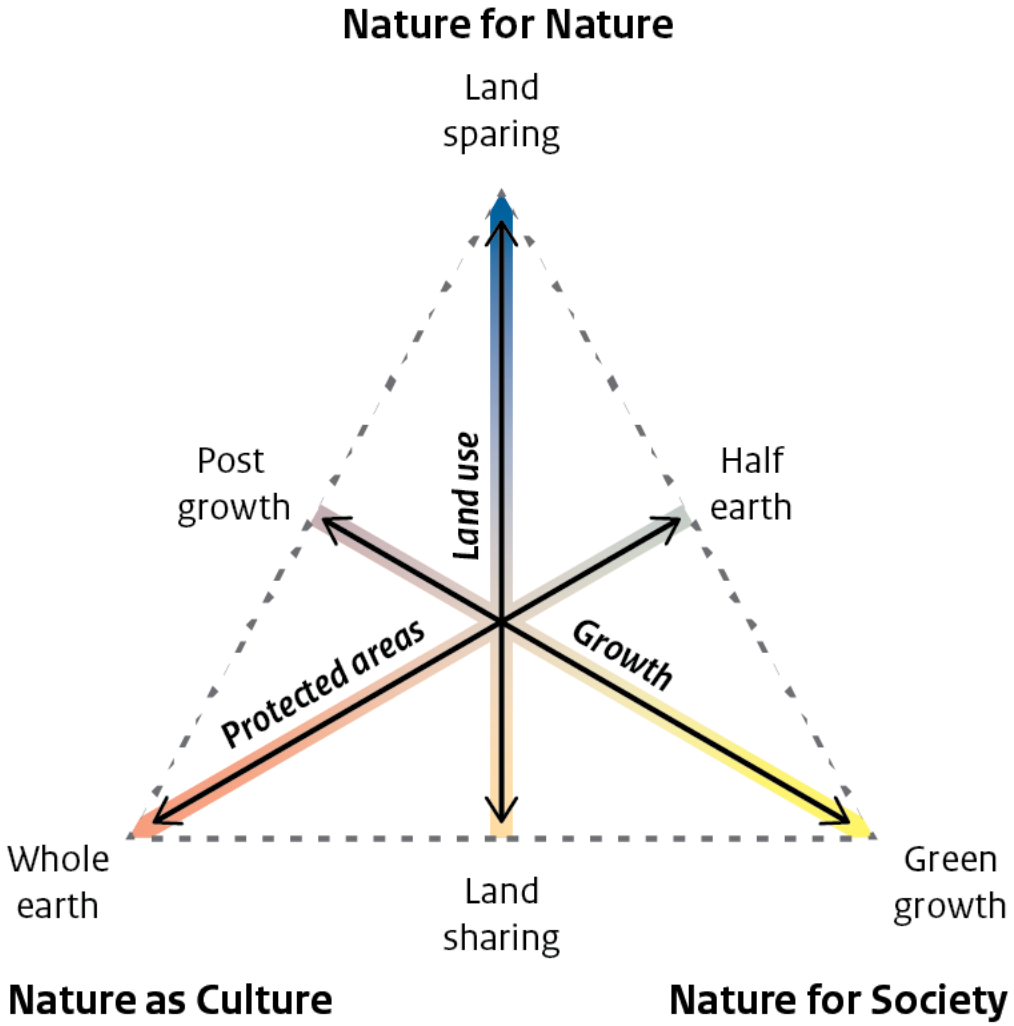


Urban Visons

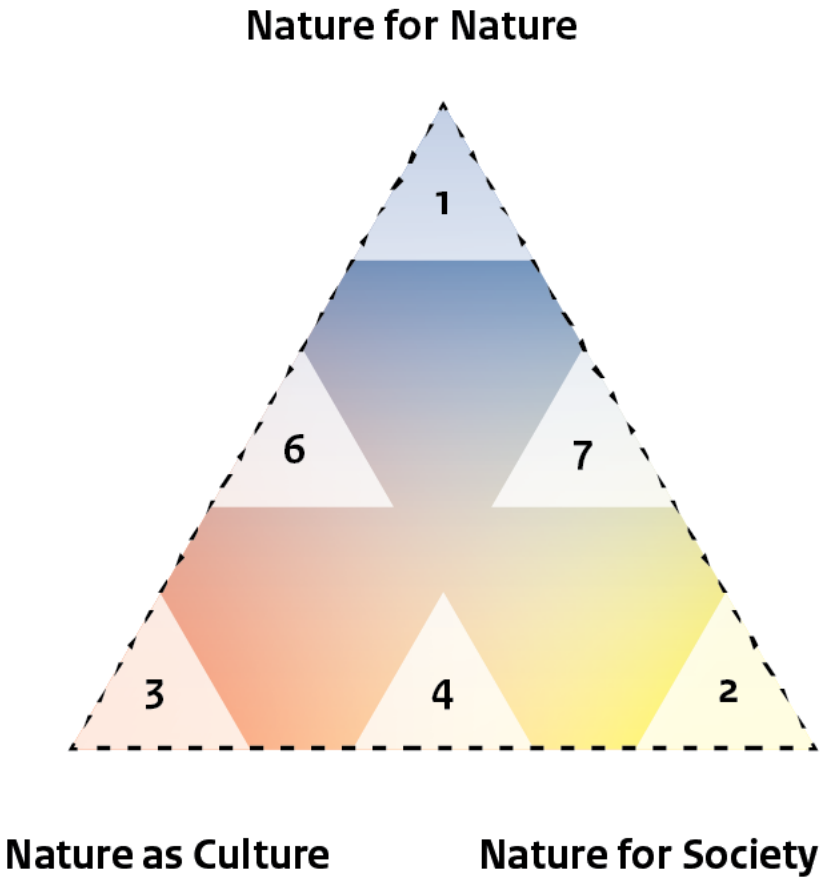
Mansur, A.V. et al. 2022. Nature futures for the urban century: Integrating multiple values into urban management. *Environmental Science & Policy*, *131*, pp.46-56.

6 Illustrative Narratives

Scenarios of protected areas, land use an growth in the Nature Futures Framework



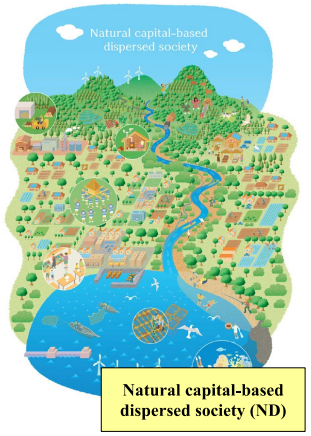
The 6 narrative points in the Nature Futures Framework



Durán et al In Review

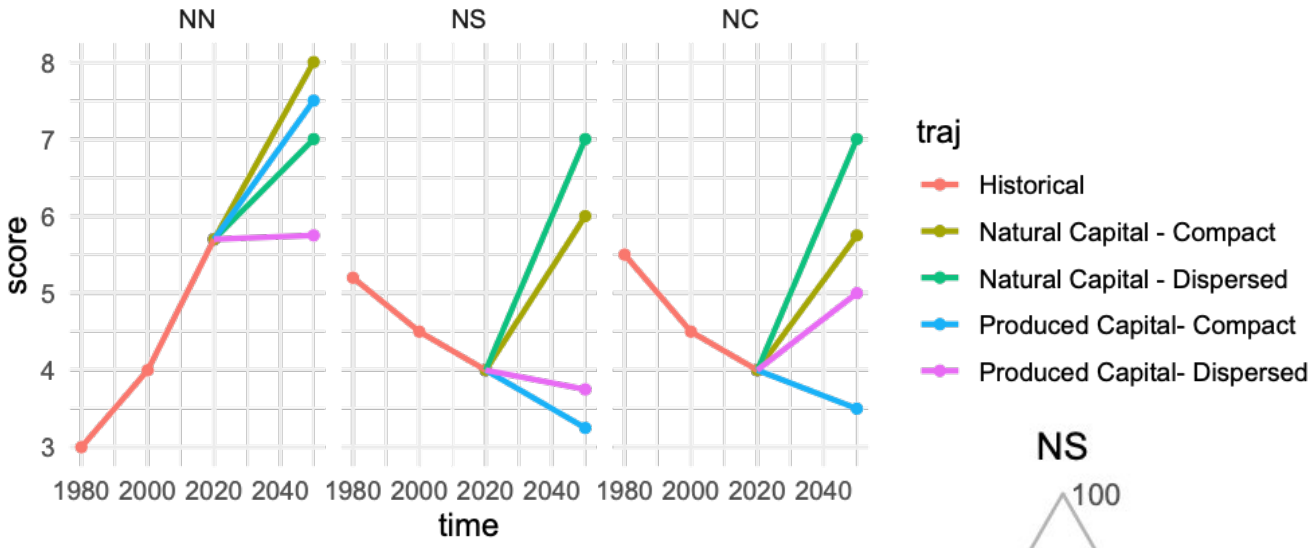
Translating Scenarios

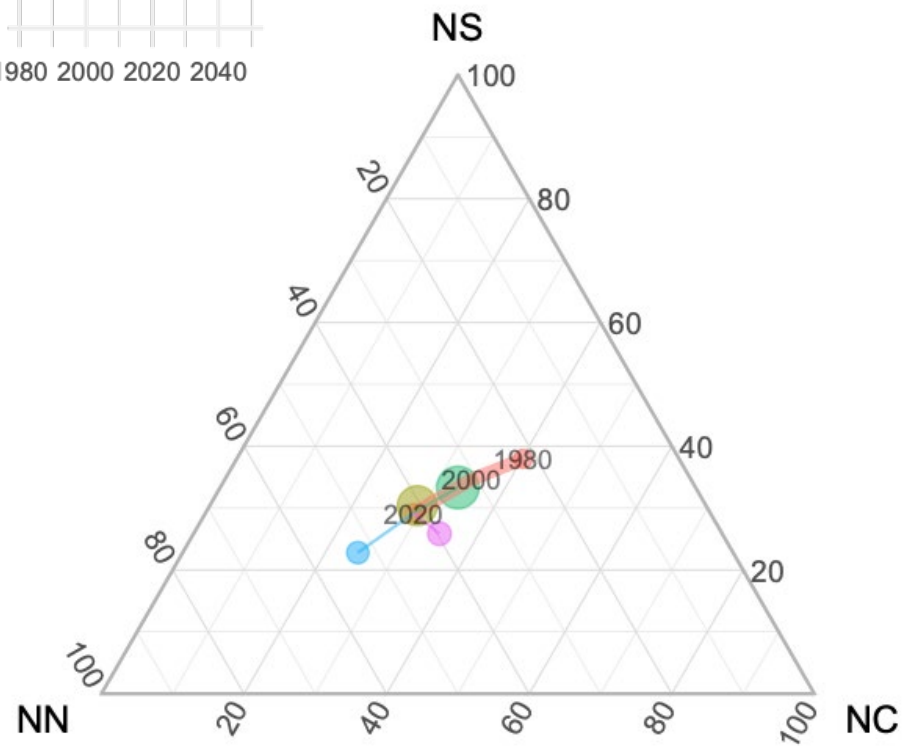
Predicting and Assessing Natural Capital and Ecosystem Services through an Integrated Social-Ecological Systems Approach (PANCES)



BaU

d society (PD)



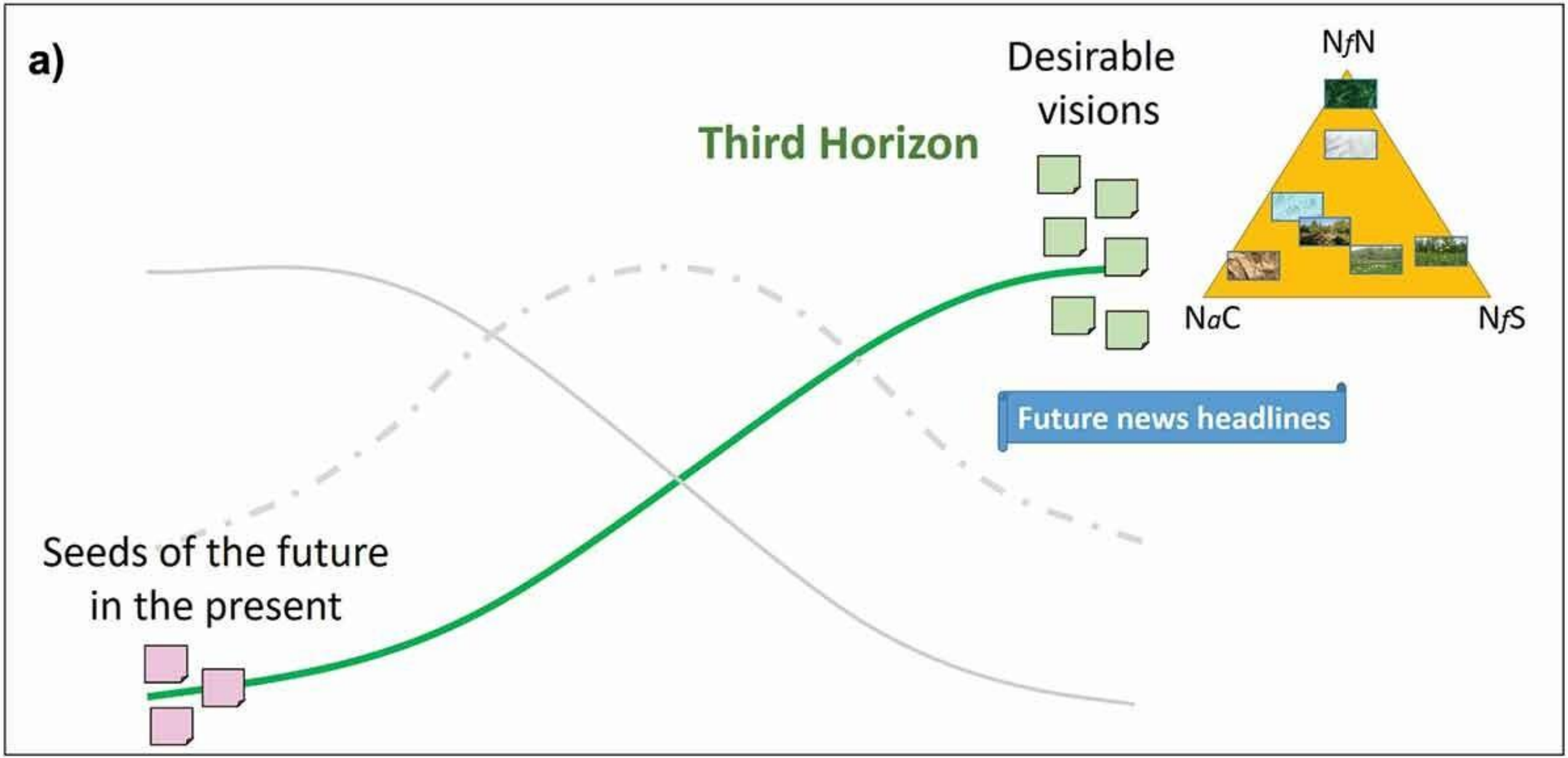


Peterson et al Draft

National Park Hollandse Duinen

1st ‘new style’ national in Netherlands: high biodiversity, cultural-heritage and socio-economic values co-exist and hopefully reinforce each other

https://www.nationaalparkhollandseduinen.nl



Kuiper, J.J et al 2022. Exploring desirable nature futures for Nationaal Park Hollandse Duinen. *Ecosystems and People*, *18*(1), pp.329-347.

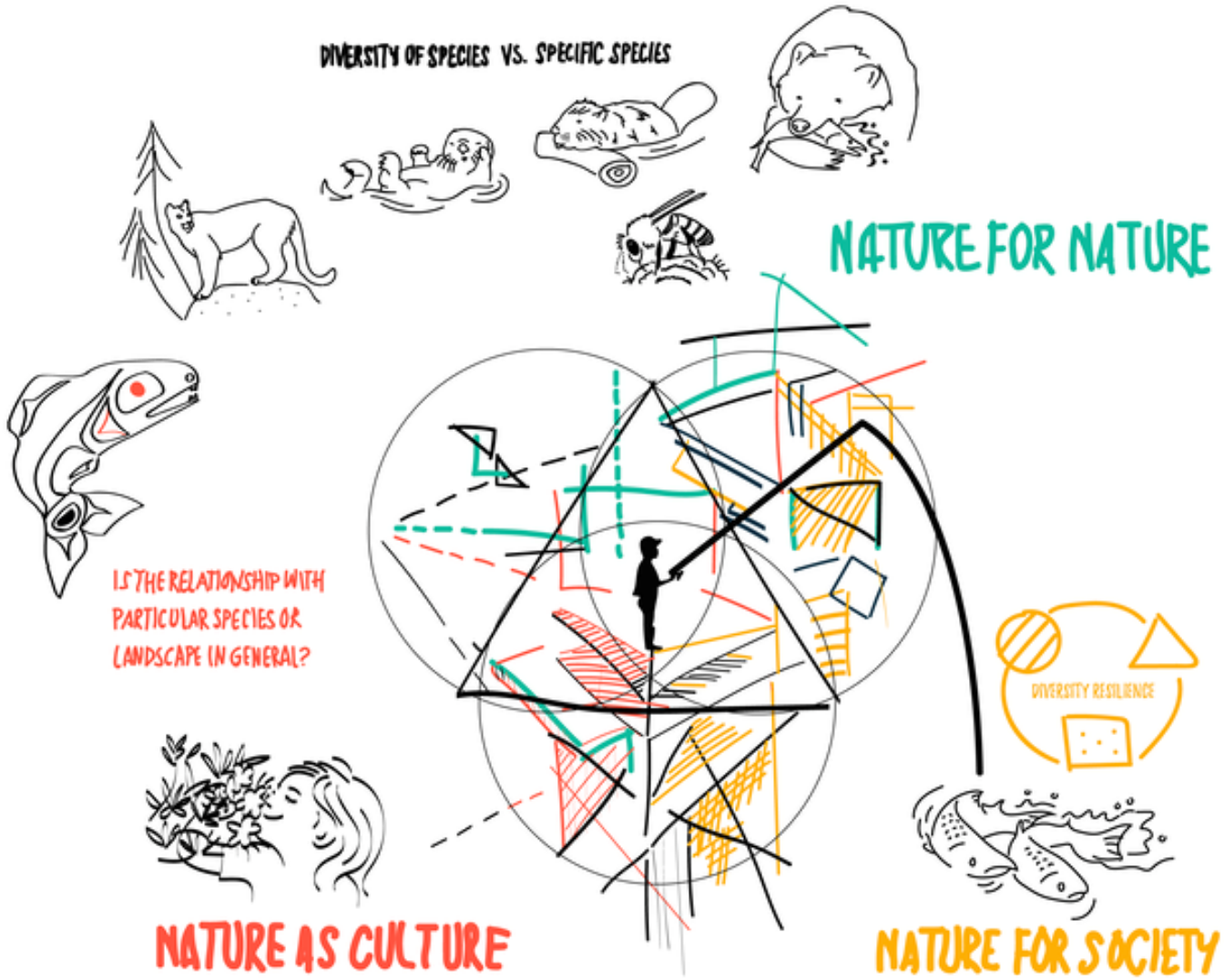
Elaborating Nature Futures

Monitoring

Translating

New Pluralistic Positive Nature Futures

Adapting & Developing New



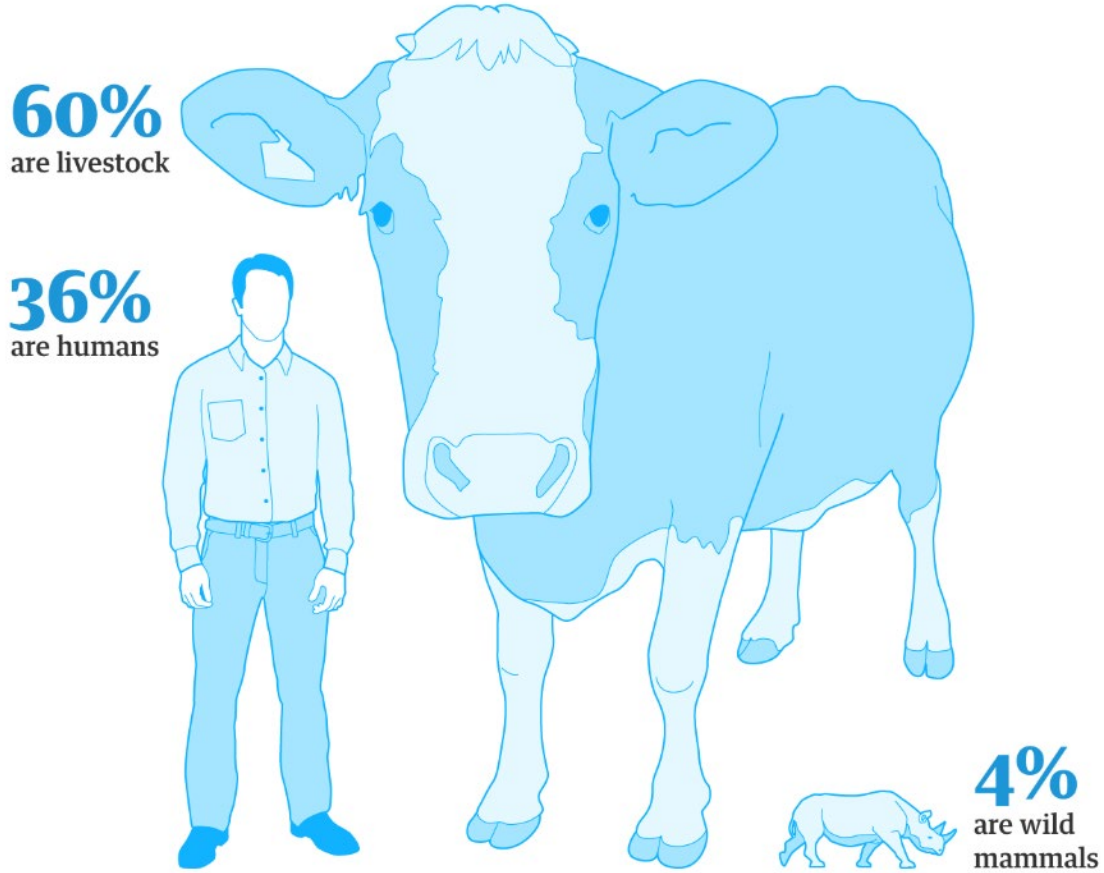
Corona crises is likely only the first of 21st century Anthropocene surprises

Creating a 'desirable' Anthropocene require transformation

Resilience focuses on both sustaining what we want to persist

Decreasing pathological resilience of perverse systems

Building the capacity to adapt or transform into something better



Bar-On et al 2017 The biomass distribution on Earth *PNAS*

The future hasn’t already been decided.

That is, climate change & loss of nature are an depressing present and future reality, but there is still a chance to create better explore and then create better futures rather than surrender to the worst

Thanks!

For more information

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BiosphereFutures.net
@biosphereFuture

IPBES.net

biosphere futures

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Participatory Social-Ecological Scenario Communities of Practice

biosphere futures

toolbox of approaches
guidance to practice
mechanisms for sharing & communication
training & informal networks
enable repeated interaction/learning

is a global collection of social-ecological scenarios
Creating a commons, to strengthen the practice

https://www.biospherefutures.net/

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SEEDS OF GOOD ANTHROPOCENES

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Multiscale scenarios for nature futures

Targets for human development are increasingly connected with targets for nature, however, existing scenarios do not explicitly address this relationship. Here, we outline a strategy to generate scenarios centred on our relationship with nature to inform decision-making at multiple scales.

Isabel M. D. Rosa, Henrique M. Pereira, Simon Ferrier, Rob Alkemade, Lilibeth A. Acosta, H. Resit Akcakaya, Eefje den Belder, Asghar M. Fazel, Shinichiro Fujimori, Mike Harfoot, Khaled A. Harhash, Paula A. Harrison, Jennifer Hauck, Rob J. J. Hendriks, Gladys Hernández, Walter Jetz, Sylvia I. Karlsson-Vinkhuyzen, HyeJin Kim, Nicholas King, Marcel T. J. Kok, Grygoriy O. Kolomytsev, Tanya Lazarova, Paul Leadley, Carolyn J. Lundquist, Jaime García Márquez, Carsten Meyer, Laetitia M. Navarro, Carsten Nesshöver, Hien T. Ngo, Karachepone N. Ninan, Maria G. Palomo, Laura M. Pereira, Garry D. Peterson, Ramon Pichs, Alexander Popp, Andy Purvis, Federica Ravera, Carlo Rondinini, Jyothis Sathyapalan, Aafke M. Schipper, Ralf Seppelt, Josef Settele, Nadia Sitas and Detlef van Vuuren

Scenarios are powerful tools to envision how nature might respond to different pathways of future human development and policy choices[1]. Most scenarios developed for global environmental assessments have explored impacts of society on nature, such as biodiversity loss, but have not included nature as a component of socioeconomic development[2]. They ignore policy objectives related to nature protection and neglect nature's role in underpinning development and human well-being. This approach is becoming untenable because targets for human development are increasingly connected with targets for nature, such as in the United Nations' Sustainable Development Goals. The next generation of scenarios should explore alternative pathways to reach these intertwined targets, including potential synergies and trade-offs between nature conservation and other development goals, as well as address feedbacks between nature, nature's contributions to people, and human well-being. The development of these scenarios would benefit from the use of participatory approaches, integrating stakeholders from multiple sectors (for example, fisheries, agriculture, forestry) and should address decision-makers from the local to the global scale[3], thereby supporting assessments being undertaken by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES).

A strategy for IPBES-tailored scenarios

Changes in nature, including biodiversity loss, emerge from interactions between drivers operating across a wide range of spatial scales, from local to global. Consequences of these changes, such as loss of ecosystem services supply, also play out across multiple scales. However, the recent IPBES methodological assessment of scenarios and models of biodiversity and ecosystem services showed that scenarios used in global assessments rarely integrate values and processes from sub-regional scales, while scenarios used at local scale are usually developed for specific contexts, hampering their comparison across regions[1]. Furthermore, existing global socioeconomic and climate change scenarios, being used by the Intergovernmental Panel on Climate Change[4], do not adequately consider nature and its contributions to people. Scenarios generated by past initiatives informing global environmental assessments, such as the Millennium Ecosystem Assessment[5], placed a stronger emphasis on nature, yet the socioeconomic pathways explored were similar to those in climate scenarios, and hence included no consideration of social–ecological feedbacks, and limited consideration of multiscale processes.

Here, we outline a two-step strategy to develop a new generation of scenarios that overcome these limitations, in accordance with guidance provided by IPBES[1], which encouraged close collaboration with the wider scientific community "to develop a flexible and adaptable suite of multiscaled scenarios specifically tailored to its [IPBES's] objectives"[1]. The steps are as follows: (i) extend existing global scenarios developed by the climate-science community, by modelling impacts on biodiversity and ecosystem services (Fig. 1a); and (ii) make an ambitious effort to create a set of multiscale scenarios of desirable 'nature futures', based on the perspectives of different stakeholders, taking into account goals for both human development and nature stewardship (Fig. 1b).

Global biodiversity scenarios

Potential global trajectories for drivers of ecosystem change have been recently explored by the climate-science community[6]. Although targeting long-term analyses, with low sensitivity to short-term and local/regional dynamics, the shared socio-economic pathways (SSPs) explore a wide range of human development pathways, from slow to fast rates of population growth, economic growth, technological development, trade development and implementation of environmental policies. The SSPs can be used in combination with representative concentration pathways (RCPs), which describe pathways of greenhouse gas emissions resulting in different climate change scenarios.

Integrated assessment models and global climate models can translate relevant combinations of SSPs/RCPs into land-use change and climate change projections.

Rosa, I.M.D., Pereira, H.M., Ferrier, S. *et al.* Multiscale scenarios for nature futures. *Nat Ecol Evol* **1**, 1416–1419 (2017). https://doi.org/10.1038/s41559-017-0273-9

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RESEARCH ARTICLE

PEOPLE AND NATURE | BRITISH ECOLOGICAL SOCIETY

Developing multiscale and integrative nature–people scenarios using the Nature Futures Framework

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Abstract

1. Scientists have repeatedly argued that transformative, multiscale global scenarios are needed as tools in the quest to halt the decline of biodiversity and achieve sustainability goals.
2. As a first step towards achieving this, the researchers who participated in the scenarios and models expert group of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) entered into an iterative,

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General information on Scenarios

Chapter 11

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biospherefutures.net

SES RESEARCH METHODS

Example Scenarios

Millennium Ecosystem Assessment 2005 *Ecosystems and human well-being, Vol 2, Scenarios, Ecosystems and human well-being*, Island Press, Washington, DC

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