

How can we prepare for the future and develop our regions with nature-based solutions?

RIEL seminar – Friday 13, 2024

Presented by Dr. Ingrid Coninx



My talk

- Challenges that our regions are facing – Europe and Australia
- Nature-based solutions as a way out of the impasse
- #howto – how to get ourselves organised
 - Transformative governance for progress in regional development
- Reflection on opportunities for nature-based regional development in Australia

Wageningen mission



To explore
the potential
of nature to
improve the
quality of life

Organisation chart

"Nature-based solutions for a greener world"



Biodiverse Environment



Green Climate Solutions



Green Cities



Sustainable Land Use

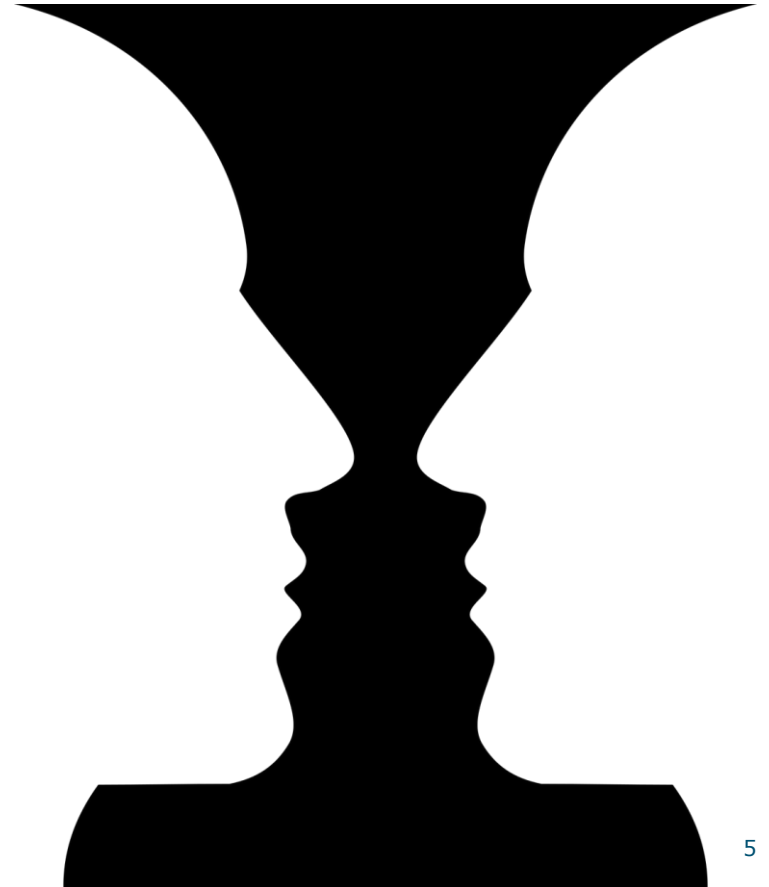


Sustainable Water Management



Benefit of using “concepts”

- Abstract ideas
- Helps to structure and make sense of complex phenomena
- Application enables deeper understanding, communication, and problem-solving



Regions: brace yourself!



Extra complex



Fragmented policy programmes

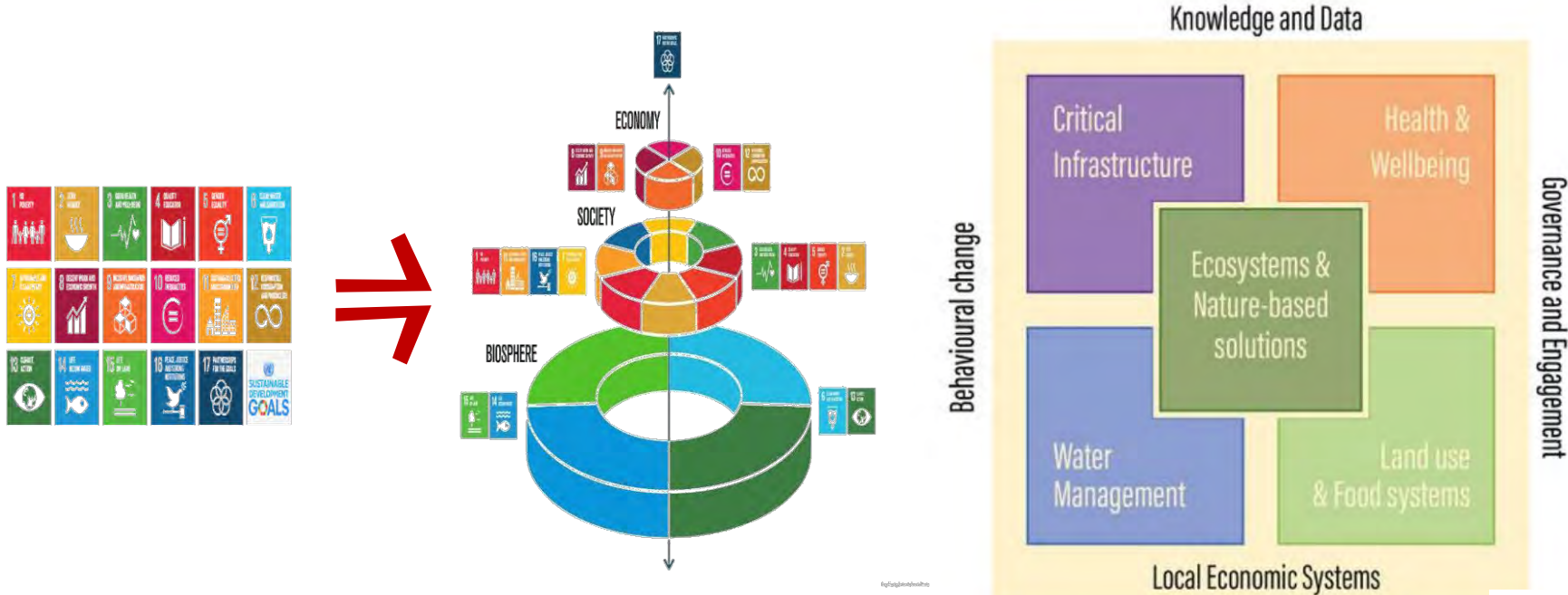


Community protest



Uncertainty about the future

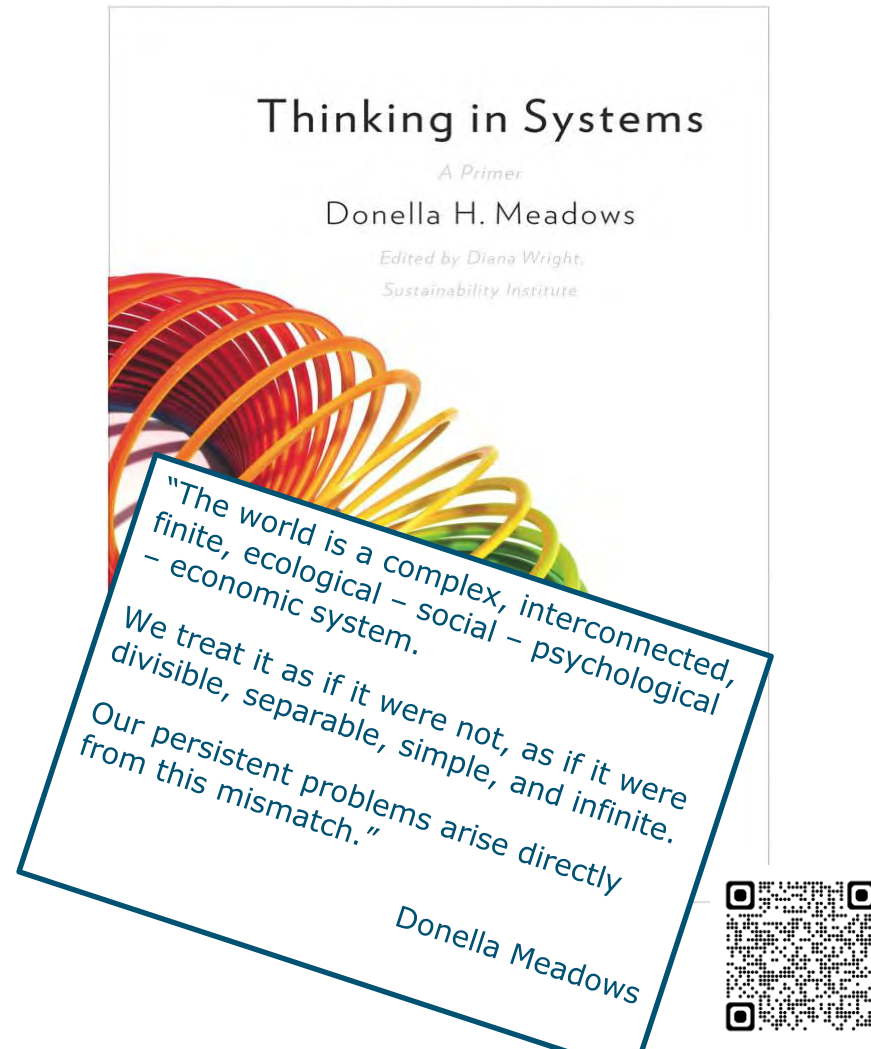
Key community systems – NBS to reconnect







Systems transformation

Systems transformation refers to a fundamental change in the structure and functioning of a system.

Issues are solved by changing the dynamics in the underlying systems, rather than just addressing symptoms.



	NbS options		NbS benefits		Climate impacts addressed
 Water management (Section 3.6)	Restoration of rivers and floodplains	→	Regulation of water flows	→	Droughts
	River buffers (e.g. vegetation strips)		Reduction of floods and soil erosion		Floods
	Water sensitive forest management		Recreation and aesthetic appreciation		
			Biodiversity		
			Water quality		
 Forests and forestry (Section 3.7)	Protection and restoration of forests	→	Regulation of water flows	→	Droughts
	Sustainable forest management		Reduction of floods		Floods
	Integration of trees/forest into the landscape		Control of disease and pests		Fires
			Slope stabilisation		
			Carbon sequestration		
			Biodiversity		
			Recreation and aesthetic appreciation		
 Agriculture (Section 3.8)	Improved soil and water management	→	Retention of water and soil retention	→	Droughts
	Crop type diversification and rotation		Mitigation of heat stress		Floods
	Agroforestry		Control of disease and pests		Heat stress
			Carbon sequestration		
			Soil fertility		
			Biodiversity		
 Urban areas (Section 3.9)	Parks, forest, street trees	→	Cooling air temperature	→	Floods
	Green buildings (e.g. green roofs, green walls)		Regulation of water runoff		Heat stress
	NbS for water management (e.g. bioswales, detention ponds)		Carbon sequestration		
			Biodiversity		
			Human health and well-being		
			Water quality		

Source: <https://www.climateforesight.eu/solutions/nature-based-solutions/>



Refinding the connection nature-based solutions?

Definition European Commission

Solutions that are **inspired and supported** by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions.

Definition Australian federal government

Nature-based solutions (NbS) are actions that **protect, manage, or restore** these ecosystems in ways that provide benefits to communities and ecosystems at the same time.

What types of NBS?

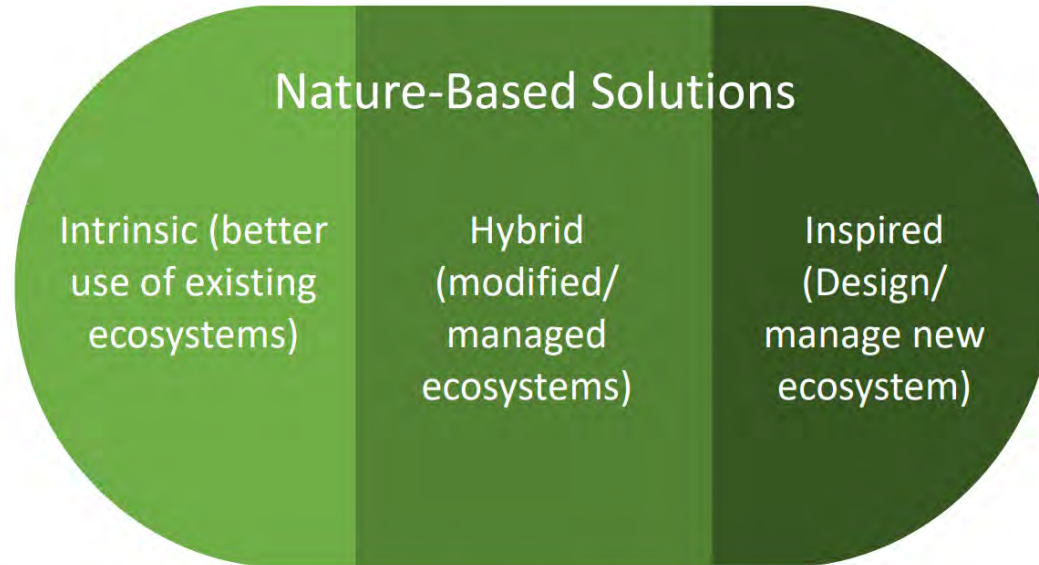


Figure 1. Typology for nature-based solutions: intrinsic, inspired and hybrid solutions.

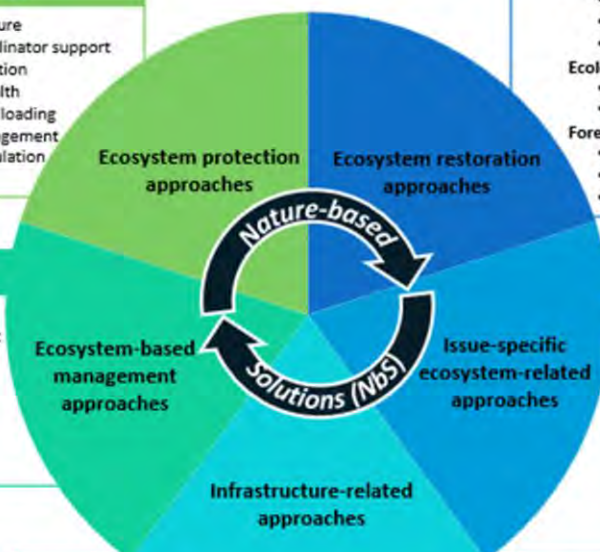




NbS	Function
Area-based conservation <ul style="list-style-type: none">Grassland conservation/ regenerationVegetation & forestry systemsWetland conservation Protected area management <ul style="list-style-type: none">Forest protectionGrassland protectionWetland protection	<ul style="list-style-type: none">Air pollutant captureBiodiversity & pollinator supportCarbon sequestrationImproved soil healthReduced nutrient loadingStormwater managementTemperature regulation

NbS	Function
Ecological Restoration <ul style="list-style-type: none">Tree-based intercroppingVegetation & forestry systemsWetland restoration Ecological Engineering <ul style="list-style-type: none">Engineered wetlandsRiparian buffer zones Forest Landscape Restoration <ul style="list-style-type: none">Tree-based intercroppingTree plantingWetland conservation/ restoration	<ul style="list-style-type: none">Air pollutant captureBiodiversity & pollinator supportCarbon sequestrationImproved soil healthReduced nutrient loadingStormwater managementTemperature regulation

NbS	Function
Integrated Coastal Zone Management <ul style="list-style-type: none">Coastal wetlandsRiparian buffer zones Integrated Water Resources Management <ul style="list-style-type: none">Engineered wetlandsGreen roofsRiparian buffer zones	<ul style="list-style-type: none">Air pollutant captureBiodiversity & pollinator supportBuilding energy efficiencyCarbon sequestrationImproved soil healthReduced nutrient loadingStormwater managementTemperature regulation

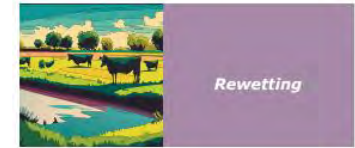


NbS	Function
Ecosystem-based Adaptation <ul style="list-style-type: none">Green roofs/ green wallsTree-based intercropping Ecosystem-based Mitigation <ul style="list-style-type: none">Coastal wetlandsGreen roofs/ green wallsTree-based intercroppingVegetation & forestry systems Ecosystem-based Disaster Risk Management <ul style="list-style-type: none">Engineered wetlandsGreen roofsRiparian buffer zones	<ul style="list-style-type: none">Air pollutant captureBiodiversity & pollinator supportBuilding energy efficiencyCarbon sequestrationImproved soil healthReduced nutrient loadingStormwater managementTemperature regulation

NbS	Function
Natural Infrastructure <ul style="list-style-type: none">Vegetation & forestry systemsCoastal and inland wetlands Green Infrastructure <ul style="list-style-type: none">Engineered wetlandsGreen roofsRiparian buffer zones	<ul style="list-style-type: none">Air pollutant captureBiodiversity & pollinator supportBuilding energy efficiencyCarbon sequestrationImproved soil healthReduced nutrient loadingStormwater managementTemperature regulation



Categorisation that works for your region



Source: Verstand et al. 2024



Investments in implementing systemic change

Netherlands

NL2120

70 million
Euros –
10-year
programme



Source: Baptist et al. 2020



European Commission

Mission on Adaptation – to support at least 150 regions and communities to become climate resilient by 2030 ~ 308 signed up

DESIRMED, NBRACER, ARCADIA

EU funded systemic NBS projects



Funded by
the European Union



NBRACER
Nature Based Solutions
for Atlantic Regional Climate Resilience



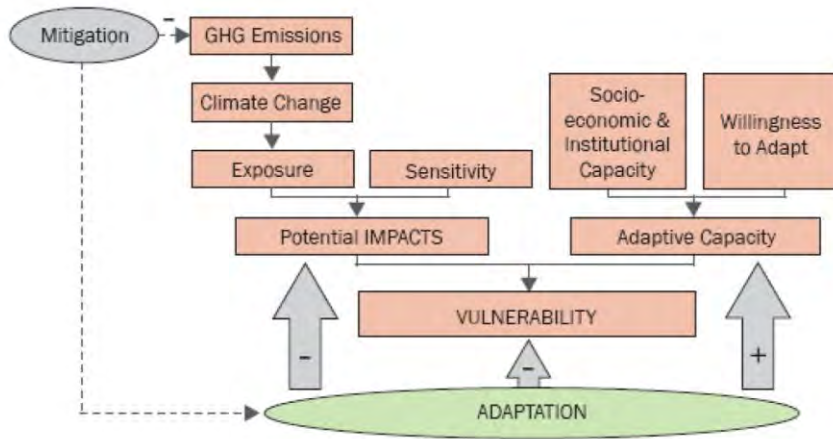
ARCADIA
Transformative climate resilience
by nature-based solutions in the
continental bio-geographical region



WAGENINGEN
UNIVERSITY & RESEARCH

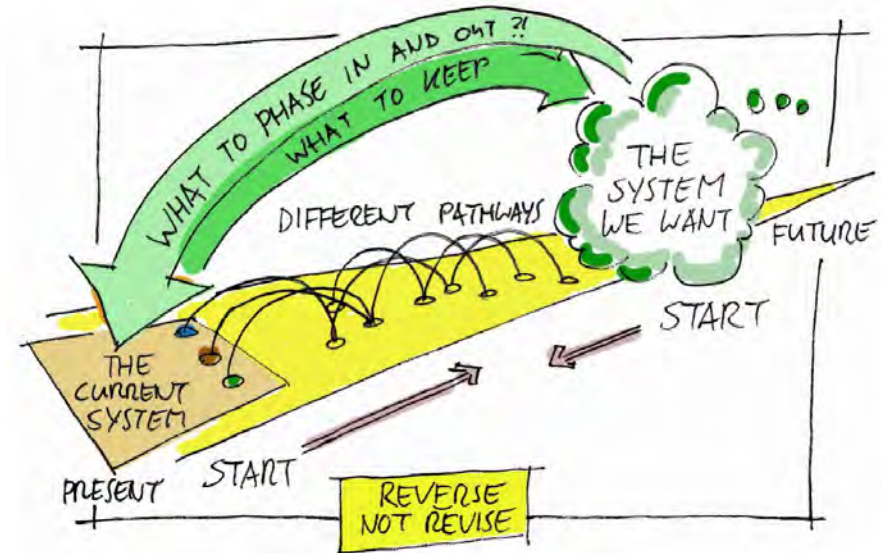
Building resilience: two common approaches

- Climate impacts assessment (forecasting)



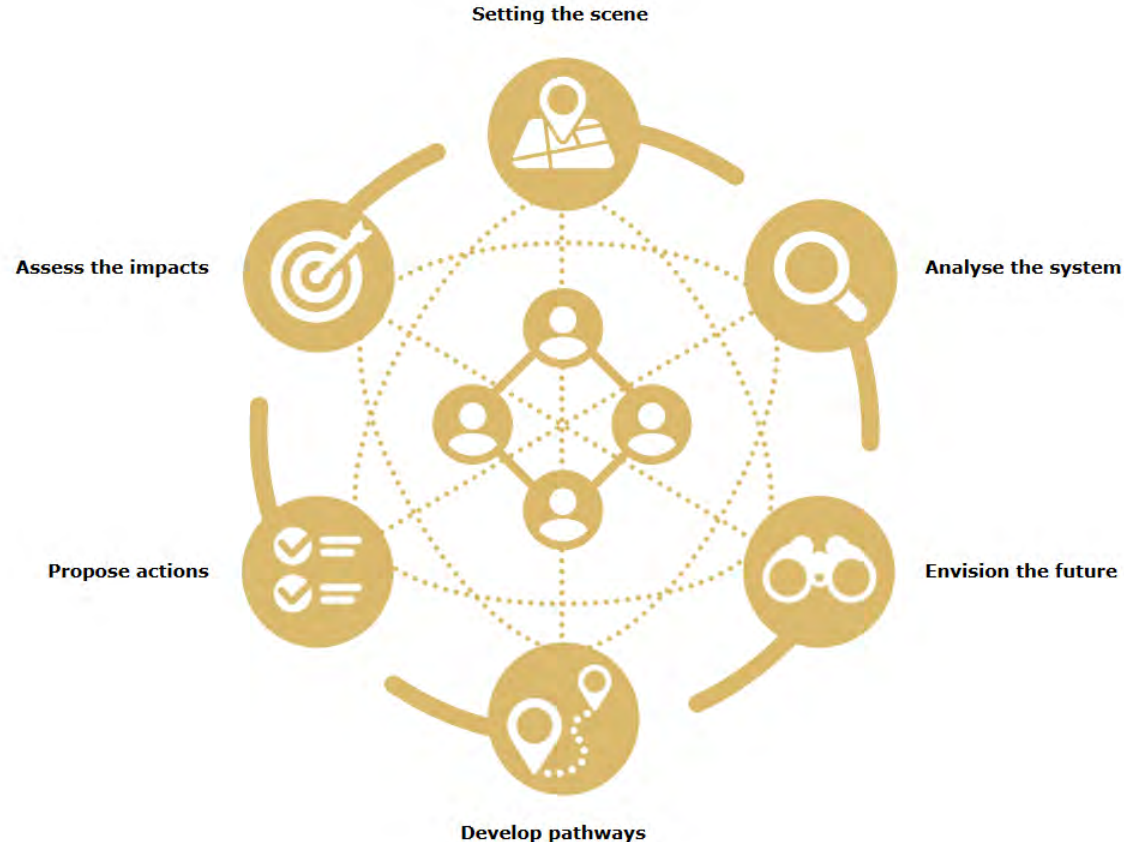
Figuur 1-2 Relatie tussen mitigatie en adaptatie (Isoard et al., 2008)

- Systems transformation (backcasting)



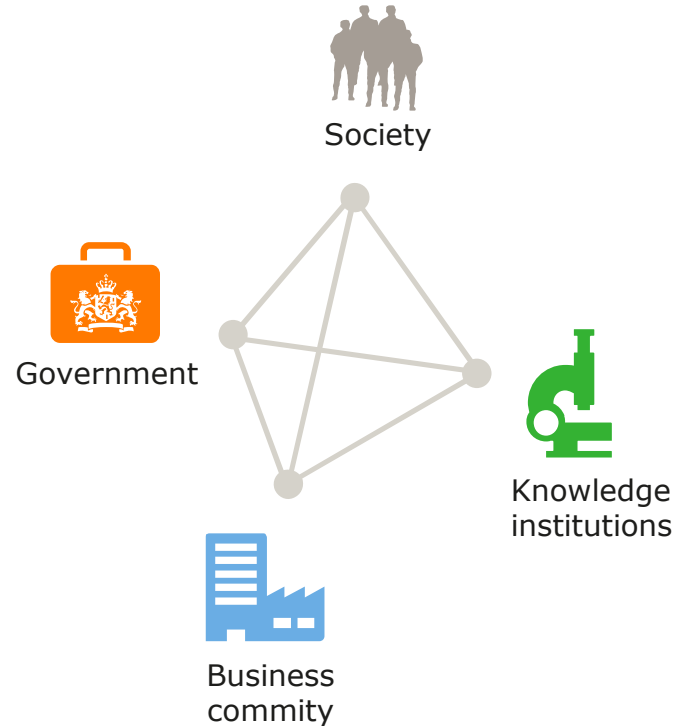
Source: Bertram de Rooij

#Howto – NBS and systems transformation



Human side of systems transformation

- Having a constructive **conversation** between **quadruple helix** partners
 - ⇒ Change in perceptions
 - ⇒ Building relationships
 - ⇒ Empathy
- **Collaborative** or even **transformative** governance



Bringing people together: emotions

- Emotions are a source of information about the way people think about something.
- Emotions do have a social function and are the result of cognition, biological processes, sensations, behaviour and body language

(source: Van Valkengoed, 2023)



Bringing people together: sense of place

- Bring “the person” back in the process, in relation to nature and to each other
 - What the place mean for each of them
 - Deep listening



...with people, and with their unique experience of the place where they live...built from the unique needs and strengths of people where they live”
(Mang et al. 2016).

The idea of place is crucial for people to develop a concrete understanding of their role in mutualistic relationships with nature. (Reemer et al. 2022) ²²

Joint understanding about systems

Method: **causal loop diagram** to detect different perceptions/mental models

Rural-urban interaction diagram – municipal scale

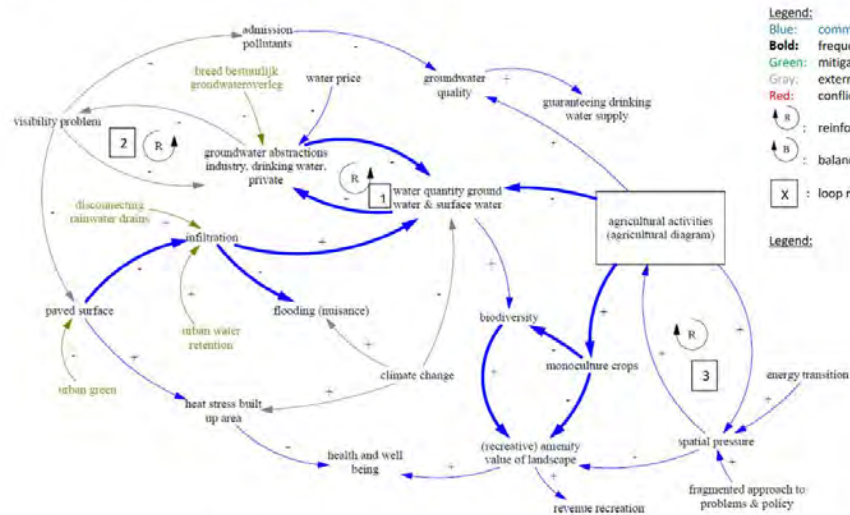


Figure 13 Rural-urban interaction diagram, visualizing stakeholders' perceptions on system interactions and problems at municipal scale

Environmental-impact diagram – catchment scale

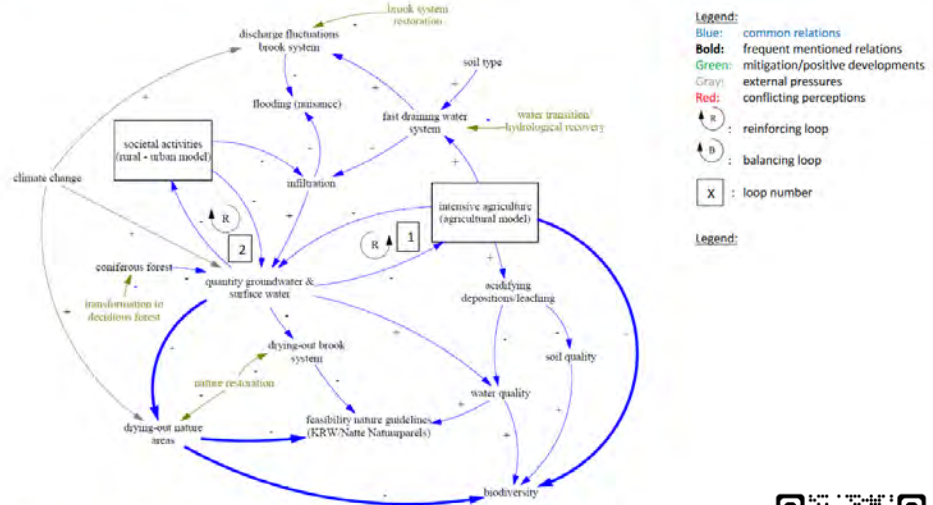
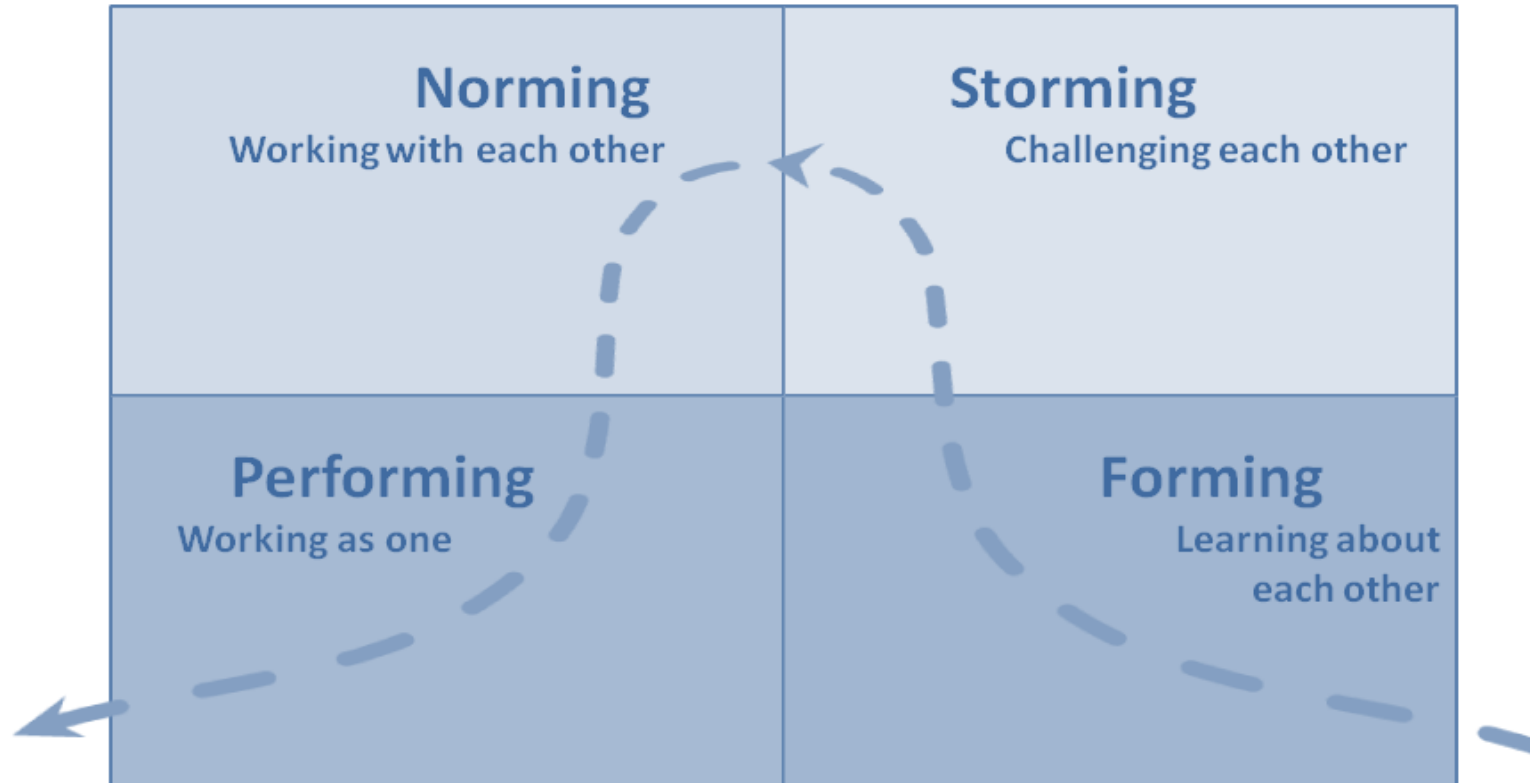


Figure 14 Environmental-impact diagram, visualizing stakeholders' perceptions on system interactions and problems at catchment scale



Forming, Storming, Norming, Performing...



Source: Tuckman, 1965



Argumentations and framing (Herzele, et al. 2014)



Appealing to science



Business

Offsets could ease Beetaloo emissions by tens of millions: Report

A new CSIRO report has outlined a series of offset opportunities at Beetaloo that could reduce the impact of emissions by tens of millions of tonnes.

Claiming authority/appealing to common sense

To former judge Tony Young, this argument is “highly implausible”.

Dr Howey says it’s “bordering on ridiculous”.

“Yes, you can feed cotton seed to cattle, but that is not the primary reason that you grow cotton. You grow cotton to sell it as a crop,” she says.

Stereotyping and blaming

Battling ‘crocodiles’ to grow the NT economy

Cattlemen’s Association chairman David Connolly has warned about a new species of crocodile, *Developis Interruptis*, which is getting in the way of business. Read what he said in our exclusive extract.



National

‘Teals and trolls’: NT Chief Minister slams opponents over gas developments

NT Chief Minister Natasha Fyles has criticised Teal independents and green activists for their opposition to the government’s use of gas in the...

Common value conflicts

Citizens' responsibility OR government safeguards

Control OR natural measures

Voluntary actions OR obliged to take action



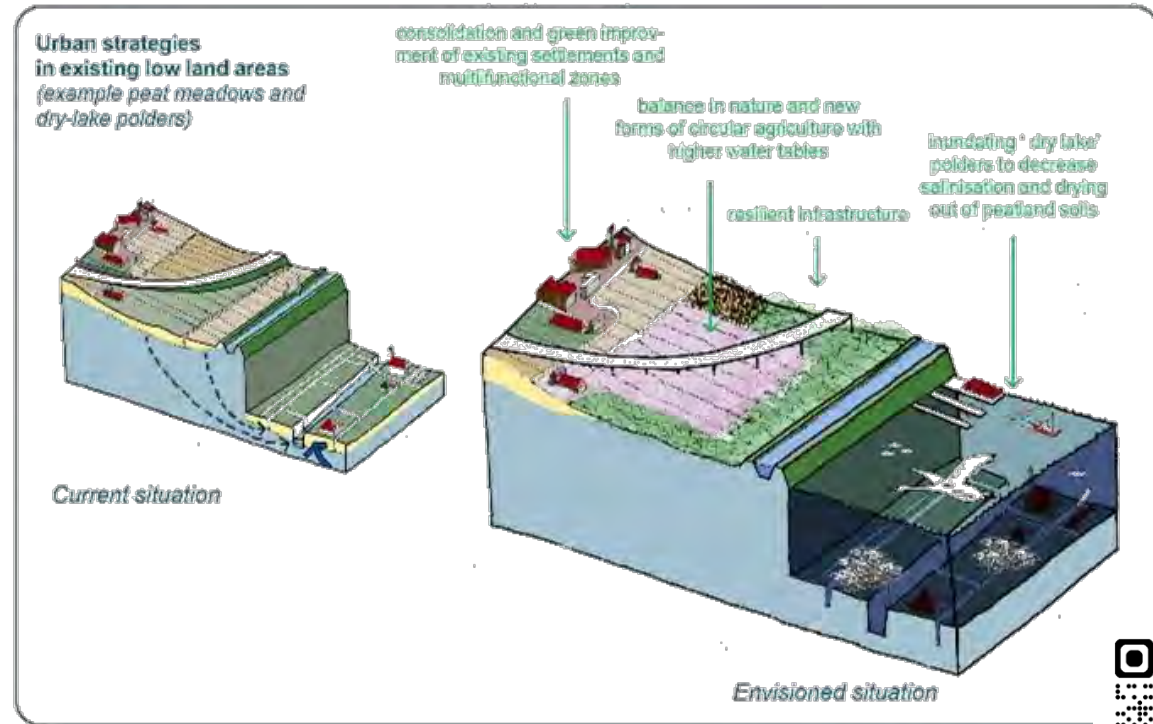
Values, interests and perceptions

Table 2: mechanisms to close the implementation gap

	Perceptions	Values	Interests
Small differences	Soft power approach via communication of the evidence base (science)	Soft power approach via policy storyline that integrated the various values Tailored implementation	Soft power approach via communication of various benefits
Large differences	Learning approach via pilots, serious gaming, participative monitoring; field visits and discussion about ongoing practices	Making the different values explicit during workshops, community or practice, education via school projects	Negotiation about interests in terms of compensation and finance Regulation to create negative or positive incentives

Visualisation as common language

Important role
of understanding
the past,
evolution and
role of region in
the bigger
context



New development principles

NL2120

1. Natural system as starting point

Landscape, soil, water system

2. Water as leverage

Retain, (re)use, store, drain

3. Circular and climate positive economy

Climate positive, reuse of resources, zero waste, circular agriculture

4. Adaptive spatial planning

Working with nature, nature-based solutions

5. Nature-inclusive society

Nature conservation, biodiversity, ecosystem services

6. Leaving no one behind

Just transition

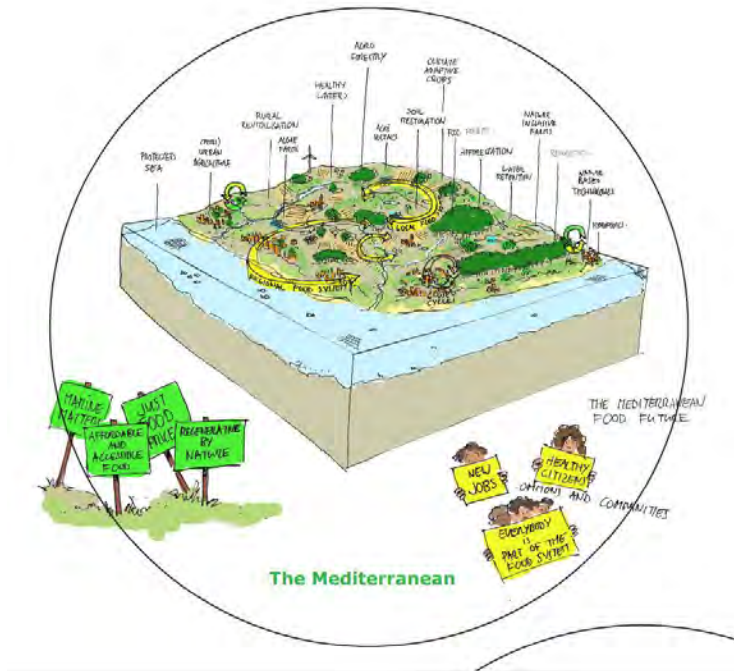
EUROPE 2100

1. Human health is planetary health

2. Biodiversity equates sociodiversity

3. Social justice in local and global alliances

Long term vision – foresight

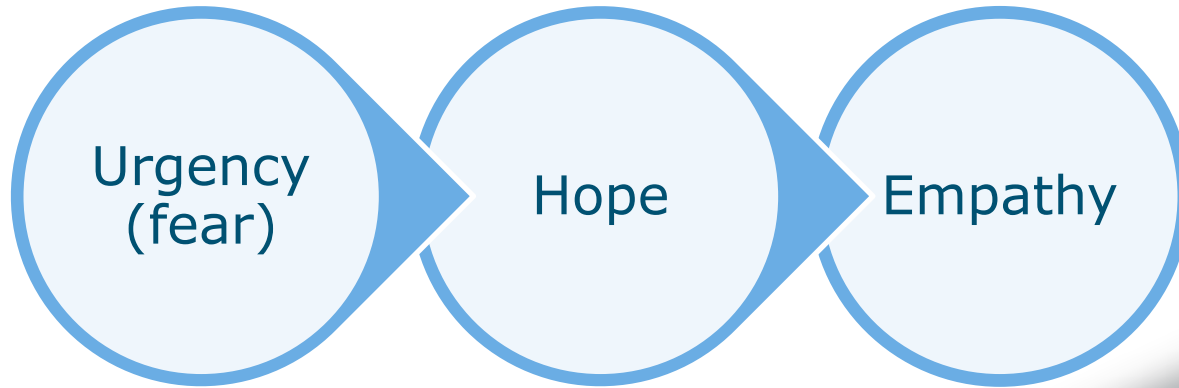


The Netherlands in 2120

At the right
time
In the right
place
Do the right
thing



Narrative for hope



**STORY
MATTERS**

Mission driven innovation

ige Exhibition Projects National Climate Summit 2024 Børnenes Klimaaunivers Global Youth Climate Summit About Klimatorium News

A MEETING PLACE WITH A MISSION AND A VISION

Klimatorium - who are we?

Klimatorium's mission is, through collaboration between private and public companies, knowledge institutions and civil society, to develop new solutions to current and future challenges in the areas: Coastal Climate Challenges, Green Energy, Circular Economy, Water and the Environment. Solutions that can be used and disseminated locally, regionally, nationally and internationally.



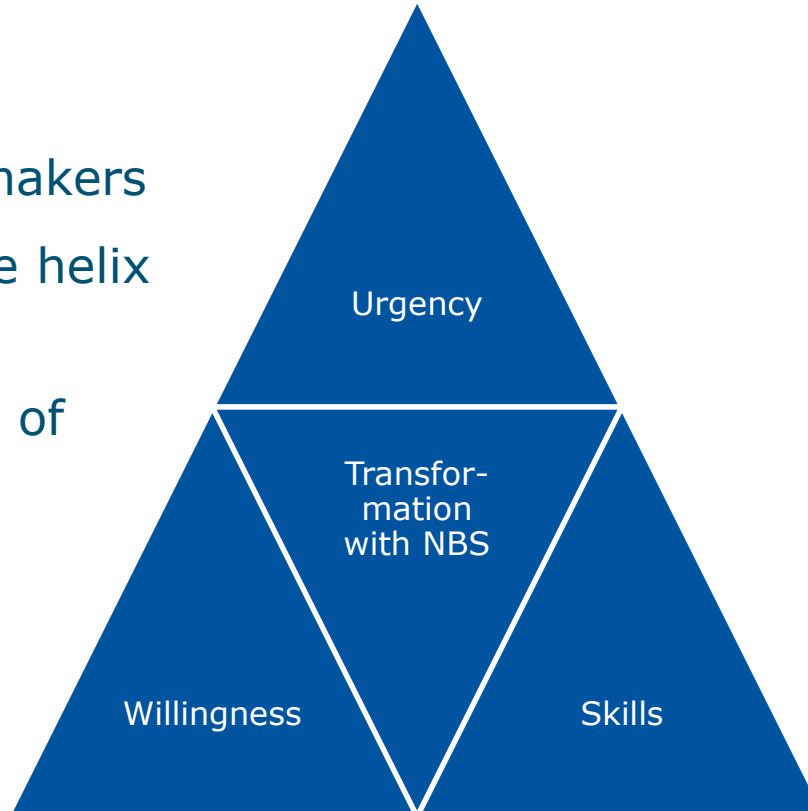
Klimatorium creates solutions and spreads awareness of them



Nature-based transformation: Ready for it?

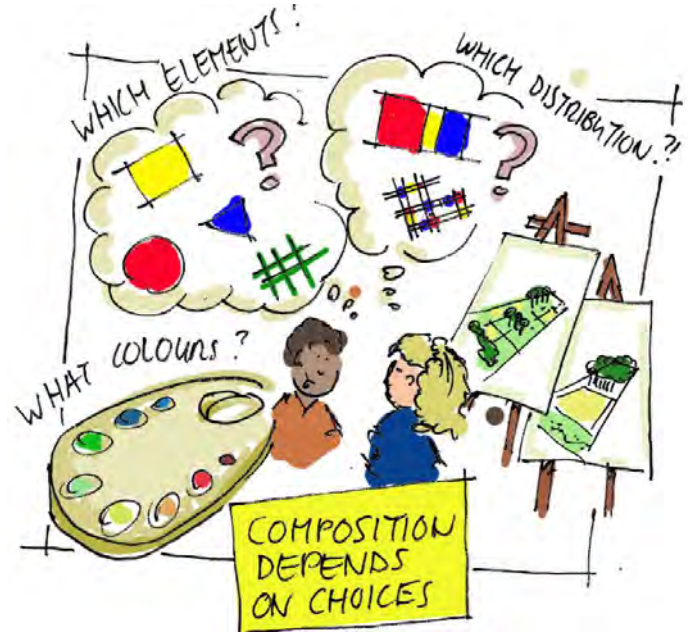
Efforts:

- NBS in policies
- Investment by policymakers
- Having these quadruple helix conversations
- Place-based co-design of future vision on maps



Opportunities for nature-based development

- Design Northern Territory 2120 with CDU students and staff
- Starting point for regional conversation about:
 - Development principles
 - Different potential futures, co-design on maps



Opportunities for nature-based development

[HOME](#)[ABOUT ▾](#)[EDUCATION & TRAINING](#)[RESEARCH PROGRAMS](#)[BLOG](#)[GET INVOLVED](#)A wide-angle landscape photograph showing rolling green hills in the foreground, a dense forest in the middle ground, and a range of blue-grey mountains in the background under a hazy sky.

Developing pathways and tools for Australia's industries to become nature positive.



Thank you!

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