

Nature-based solutions for climate resilient food systems

Road to Climate Adaptation Summit: Nature-based solutions (online event, 22-10-2020)

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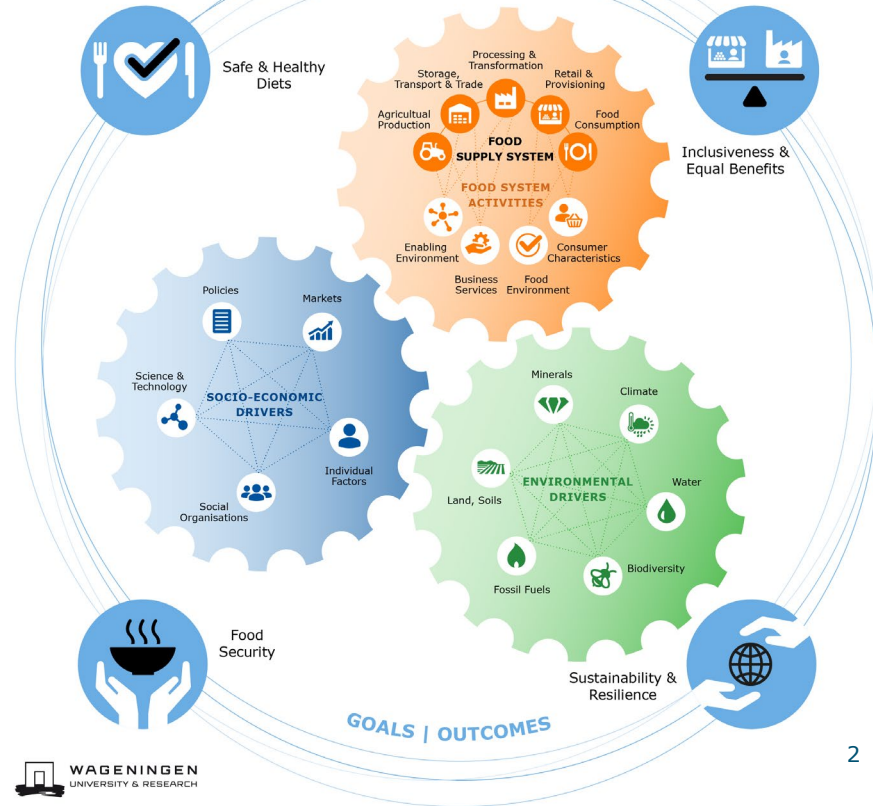


Food systems challenges under climate change

- Inability to feed the population
- Inability to deliver a safe and healthy diet
- Inability to provide equal and equitable benefits
- Inability to sustainably maintain the environments

Food systems framework

Van Berkum et al. 2018, Wageningen University & Research





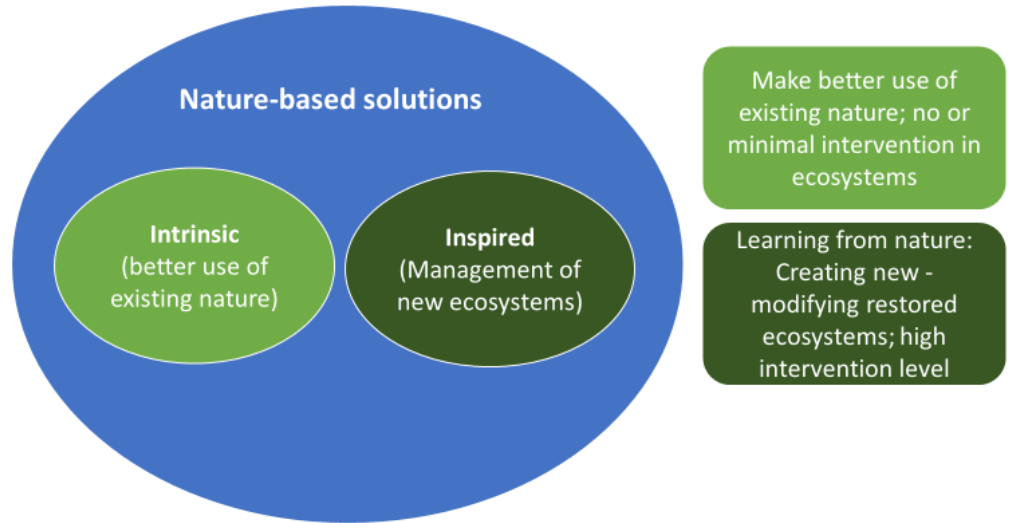
Different types of nature-based solutions

■ Intrinsic

- Use of existing ecosystems

■ Inspired

- Creation of new ecosystems/engineering



Examples

- Two examples that showcase how nature-based solutions can help to make food systems more climate resilient
 - Intrinsic nature-based solution: Rainwater harvesting - terraces build up by vegetative strips (Ethiopia)
 - Inspired nature-based solution: Optimizing natural pest control via improvements in crop variety and surrounding landscape

Intrinsic: Rainwater harvesting – terraces

- Use of existing eco-system characteristics
- Using topographic features to prevent runoff and enhance infiltration
- Interventions limited to construction of soil bands and planting grass/herbs



Terraces build up by vegetative strips over several decades in humid-tropical Ethiopia

(photo by Saskia Keesstra)



Rainwater harvesting (terraces) as nature-based adaptation



climate change challenges	Food security	Safe and healthy diet	Sustainable Environment	Inclusiveness and equity
Food security at risk due to prolonged / more frequent droughts Reduction in soil fertility due to temperature rise	++ Increase in water holding capacity leads to reduction in yield losses Reduction of erosion and nutrient losses – maintaining soil fertility	0	++ Biodiversity increase Reduction of erosion and nutrient losses Biosphere more climate resilient	? Depending on implementation and local context

Inspired nature-based solution: Use of genetics for better biological control

- Optimizing natural pest control via improvements in crop variety and surrounding landscape (work in progress)
- Plant genetics and differences in attraction
- Optimal agro-ecosystem landscape structure for hosting predatory insects



Using genetics for better biological control (WUR)

Use of genetics for better biological control as nature based adaptation



climate change challenges	Food security	Safe and healthy diet	Sustainable Environment	Inclusiveness and equity
Occurrence of pests and diseases are likely to increase due to climate change Changes in policies i.r.t. to use of pesticides	++ Reduce yield losses due to reduction in pests / diseases	++ Increased quality of food due to reduction in pesticides / insecticides residues on crop	++ Reduction of adverse effect on environment due to less pesticides use Biosphere more climate resilient	+ / - Reduced dependency on input suppliers

Nature-based solutions as transition pathways

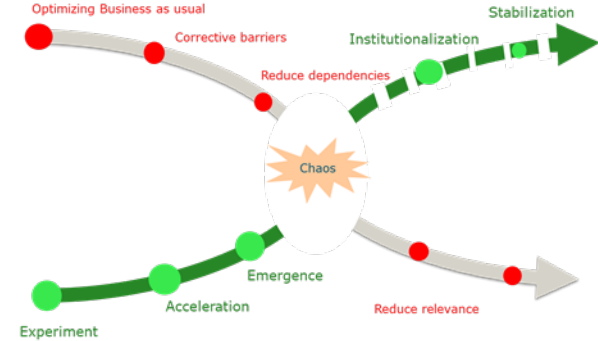
Lock-ins and drivers

- Belief systems

"From mono culture to crop diversity"

"From closing to yield gap to climate resilient food systems"

- Institutional
- Agronomical
- Technical



Transition cross (Visser et al., 2019)



Strip cropping (Wageningen UR)

Conclusions- future outlook

- Adding *inspired* nature-based solutions to current discourse will increase opportunities to sustainably achieve climate resilient food systems
- Future research (examples):
 - Looking at nature –based solutions from a transition perspective: From focus on closing yield gaps towards climate resilient food systems
 - Stakeholders (people who win and loose)
 - Cost-effectiveness (long-term)

Acknowledgement

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