Nature-based Solutions for Climate Resilient and Circular Food Systems

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Background

Climate change in combination with population growth and economic developments are increasing risks for current food systems. New pathways need to be developed within food systems to ensure food safety, availability of water resources and biodiversity at landscape level. This project generates knowledge about interventions that make use of nature-based solutions (NBS) in order to make food systems more climate resilient and circular in the long term while at the same time food safety is ensured. Cases from Europe (the Netherlands), Africa (Ghana, Ethiopia) and Asia (Vietnam, India) will be used to explore the impacts of combinations of measures at different parts of the food system and on landscape level.

Objectives 2019

- Initiation of a scientific knowledge base for NBS for Climate Resilient and Circular Food Systems.
- Identify case studies that combine novel research with potential societal impact, as well as ' lighthouses' (shining examples).
- Develop a conceptual DSS framework (Quickscan) to assess the trade-offs between climate resilience, circularity and biodiversity.
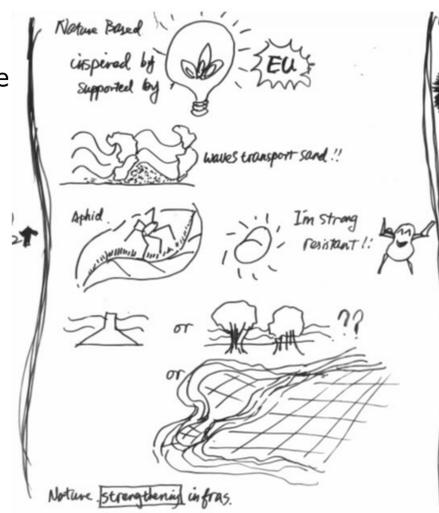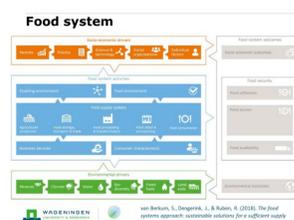
Objectives 2020-2022

Research
- Start and finish novel action based research in 15 case studies.
- Synthesis: a decision support tool to analyse trade offs between food safety, climate adaptation, circularity and biodiversity.

Communication and outreach
- Presentations at conferences such as ECCA, Global Landscape Forum and comparable conferences in the Netherlands.
- Scientific papers about combining nature-based solutions with agrotechnology, lessons learnt, scientific underpinning.
- Showcase WUR's expertise on nature - based and circular solutions by vlogs, blogs and other sources.
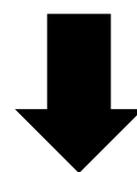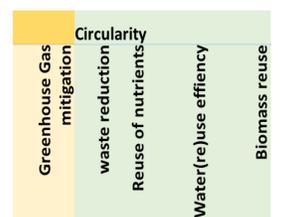
Results

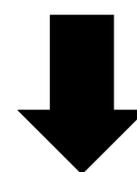*1) Developing common understanding of food systems, nature-based and circularity.*

2) Gross list of >70 potential cases studies of NBS that help food systems to achieve its goals under climate change.

*3) Preliminary short list of potential case studies*

Africa
- Fungi turns plant materials (lignine) into digestible feed/organic matter (Africa, the Netherlands)
- Synergies in Ghana's smallholder cocoa production system through Agroforestry
- Flying food/Insects on city waste (Africa)
- From competing claims to collaboration in Northern Ghana's arid landscape
- Small-scale rainwater harvesting in Tigray, Ethiopia

Europe/Netherlands
- Climate resilient and Circular Agricultural Water Supply (Netherlands)
- Nature-inclusive agriculture, Agroforestry and Food Forests (Netherlands)
- Diagnostics: food security and (blue) algal blooms (climate induced) (Netherlands)
- Bioconversion connection (use microbiology (NBS) to realise high value food/feed product with a low carbon foot print (climate mitigation) (Netherlands)
- Aquaculture for Fish (Aquaponics) and plant production (wet agriculture) (Netherlands, Asia)

Asia
- Natural pest control (Vietnam)
- Biodiversity rich Herbs in grassland (Ethiopia, India)
- Coating "manure" slow release fertilizer (Vietnam).
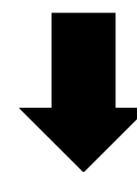
4) Analyses of case studie

For each case study factsheets are made to explore novel research questions and societal impact (building blocks for a narrative) by addressing questions such as:

What is innovative for the selected case for each part of the pie?

What can be the societal relevance of the studied intervention? Is it feasible?

What will be the research question in each case?

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