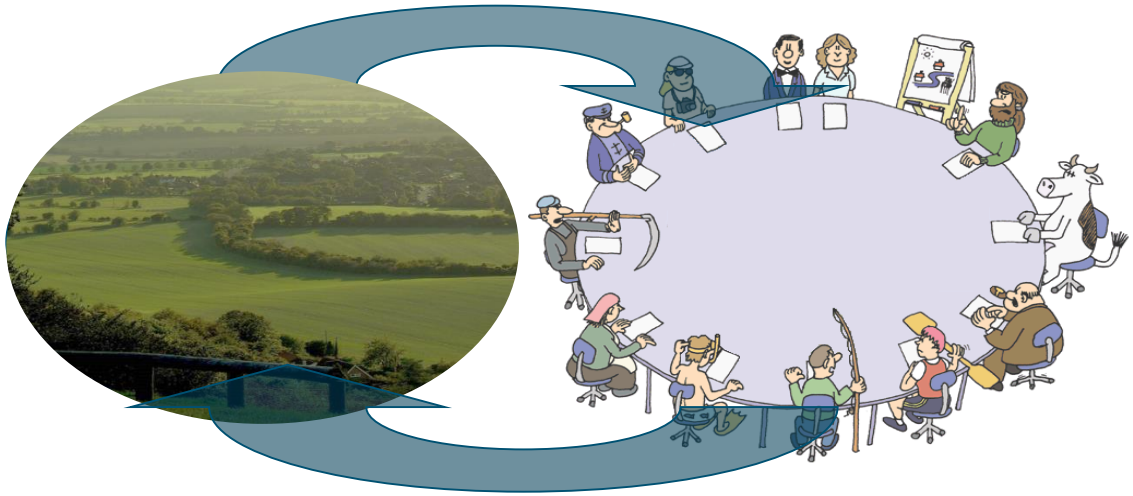
Can social-ecological networks facilitate landscape transitions towards sustainability?

Paul Opdam , Land Use Planning group, Wageningen University, NL

5th International Forum on Landscape Sustainability Science, Beijing, August 19-20, 2017



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Content

- What are transitions to sustainable landscapes?
- The role of scientists in transitions
- Introducing the social ecological network SEN
- Experimenting with SEN in practice: three cases
- Hypotheses and challenges

Transition (transformation) to sustainability:

- Fundamental change in the societal system
- Includes evolution of attitudes, values and power relationships
- Complex social learning, including paradigm shifts
- Decades
- Management: outcome uncertain and non-linear

Landscape transitions towards sustainability:

- Using the potential of natural processes in the landscape to create social & economic value (landscape services, *Termorshuizen & Opdam 2009 Landscape Ecology*)
- Integrated approach: cross-sectoral solutions, synergistic value creation
- Embedded in society: landscape governance/stewardship

Landscape governance/stewardship

- Community is 'owner' of the transformation
- Government not leading, can be involved in other roles
- Social network: trust, capacity to collaborate and social learning
- Self governance: collaborative decisions and interventions (by multiple actors with diverging interests)

Gőrg 2007. Landscape Governance. Geoforum 38 : 954-966

Bieling & Plieninger (eds.) 2017 The science and practice of landscape stewardship. Cambridge Univ. Press

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How can scientists contribute to transitions?

Two types of sustainability science:

Miller et al. 2014. The future of sustainability science: a solutions oriented research agenda. Sustainability Science 9:239-246

1. Describe and analyse sustainability problems

2. Develop evidence–based options to solve problems

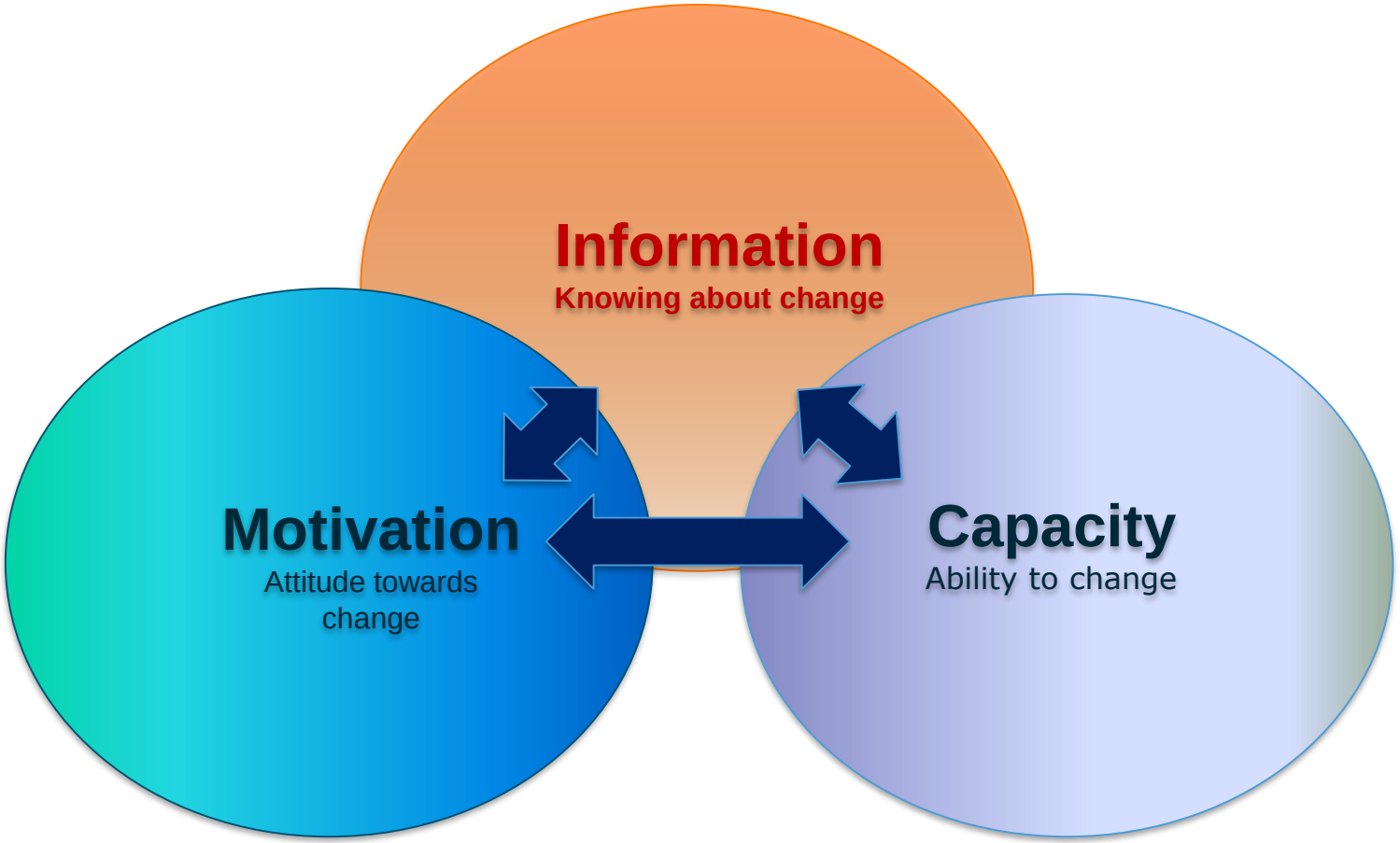
Effective use of scientific knowledge in practice:

- Scientists engage in transformation process,
- using participatory methods,
- solutions are co-created, within the local context,
- integrating generic and local knowledge,
- stakeholders make normative choices.

- *Cash et al. 2003 Knowledge systems for sustainable environment. PNAS 100:8086-8091*
- *Opdam et al. 2013 Science for action at the local landscape scale. Landscape Ecology 28:1439-1445*

Factors determining the success of social-ecological system transitions

(based on Lambin 2005 Global Environm. Change 15:177-180; Raquez & Lambin 2006 J. Land Use Science 1:109-125)



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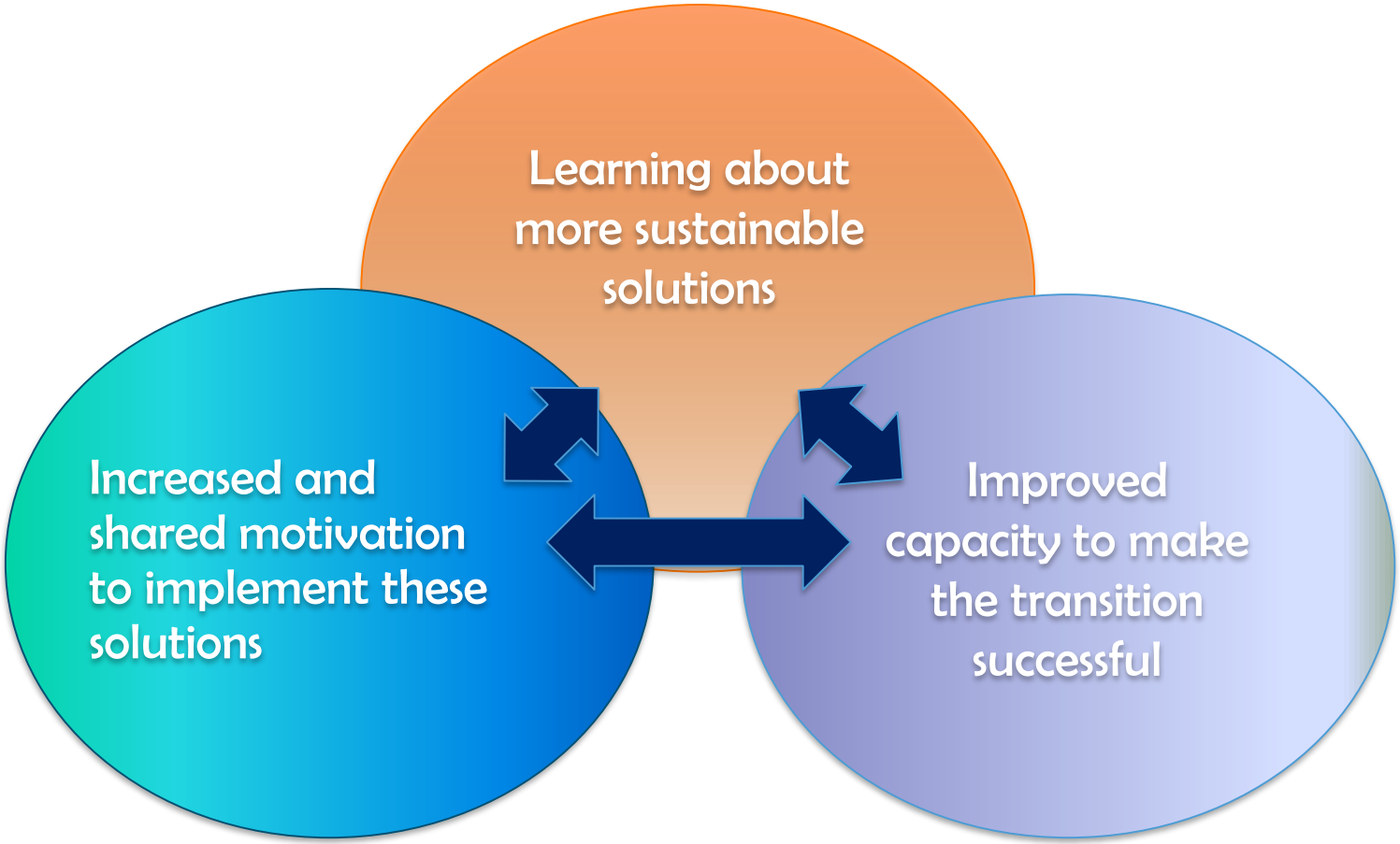
A framework for understanding the role of science in social-ecological system transitions



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Example of scientists enhancing a landscape transition

Hoeksche Waard NL

Steingröver et al. 2010 Landscape Ecology 25:825-838

Landscape services:

Natural pest control

Water purification

Landscape character

Valuable species

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Scientists supported farmers in developing natural pest control

- Green infrastructure design rules based on scientific & local knowledge
- Uncertainty in design rules shared with farmers and accepted by them
- Collaborative vision and design of green infrastructure

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Steingröver et al. 2010 Landscape Ecology 25:825-838

The Hoeksche Waard social-ecological network in transition

Pest regulation

Water purification
Landscape character
Valuable species

Dikes

Banks water courses

Field margins

Local conservation group

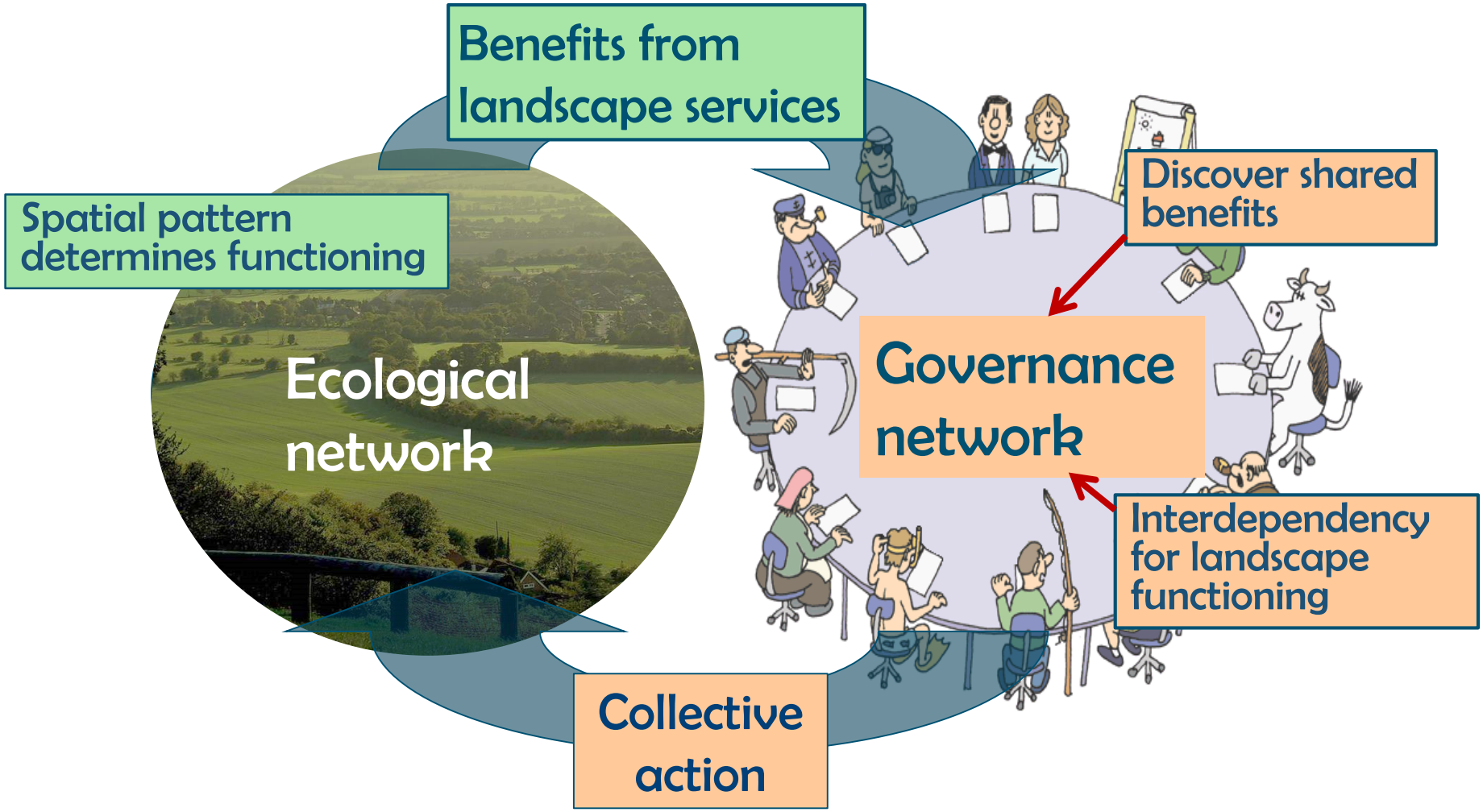
Water board

Farmers

Make new elements

Change the management of existing elements

Landscape as a social-ecological network



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Three cases

1. ★ Green circles: developing a pollinator network

2. ☀ Gouwe Wiericke: negotiations between dairy farmers and three governmental organisations

3. ★ Brummen health landscape, farmers and health organizations, citizens

The Green Circles programme

www.groenecirkels.nl

THEMES

Stimulate sustainable energy and reduce greenhouse gas emissions

Assure access to good water

Close material loops

Sustainable logistics

Improve our living environment and biodiversity

Creating a social-ecological network based on the importance of pollination

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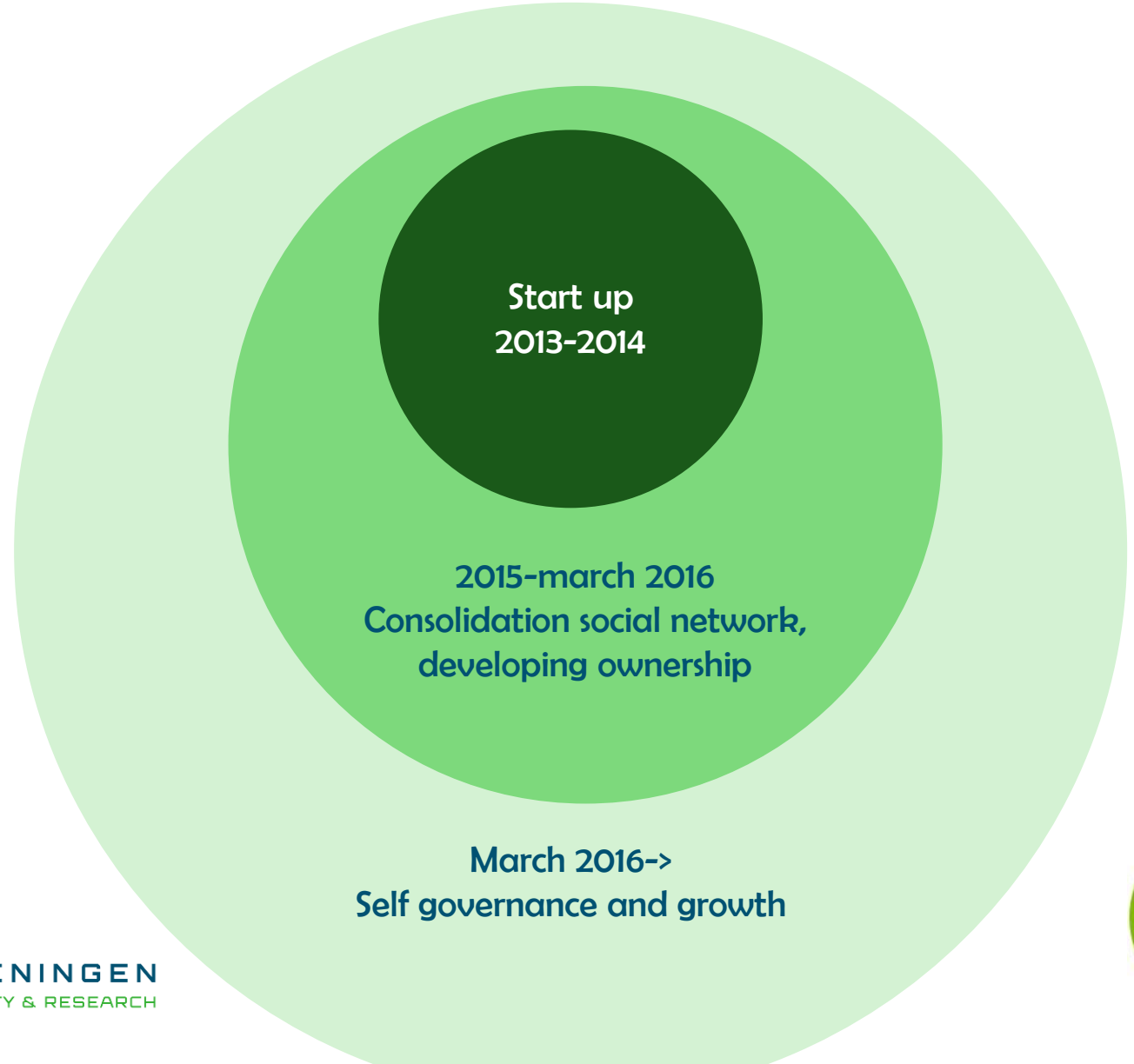
Groene Cirkels

Three phases



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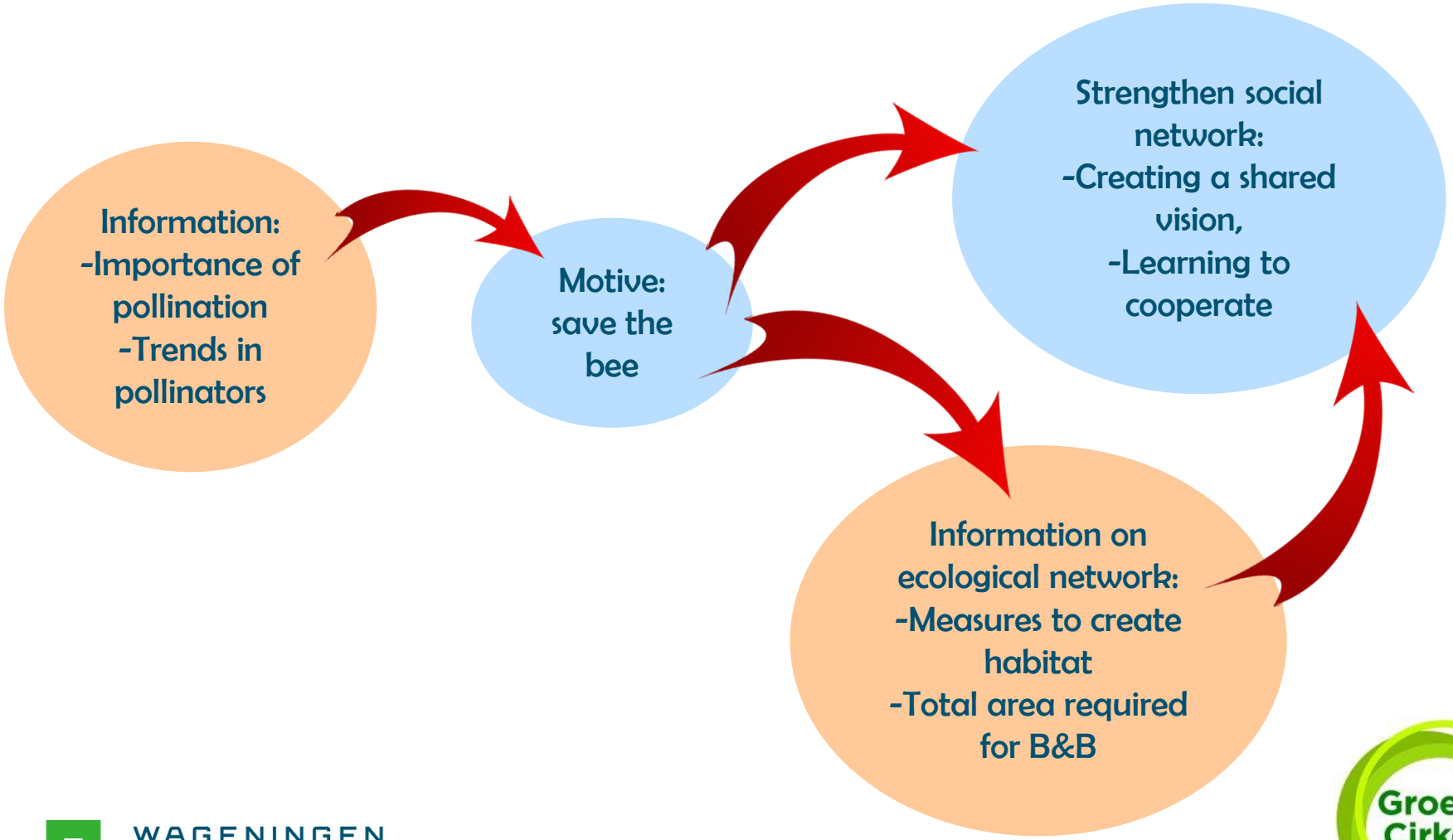
Groene Cirkels

Interventions by scientists in the start up phase



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Heineken brewery, Zoeterwoude NL

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Heineken sets the scene in summer 2014

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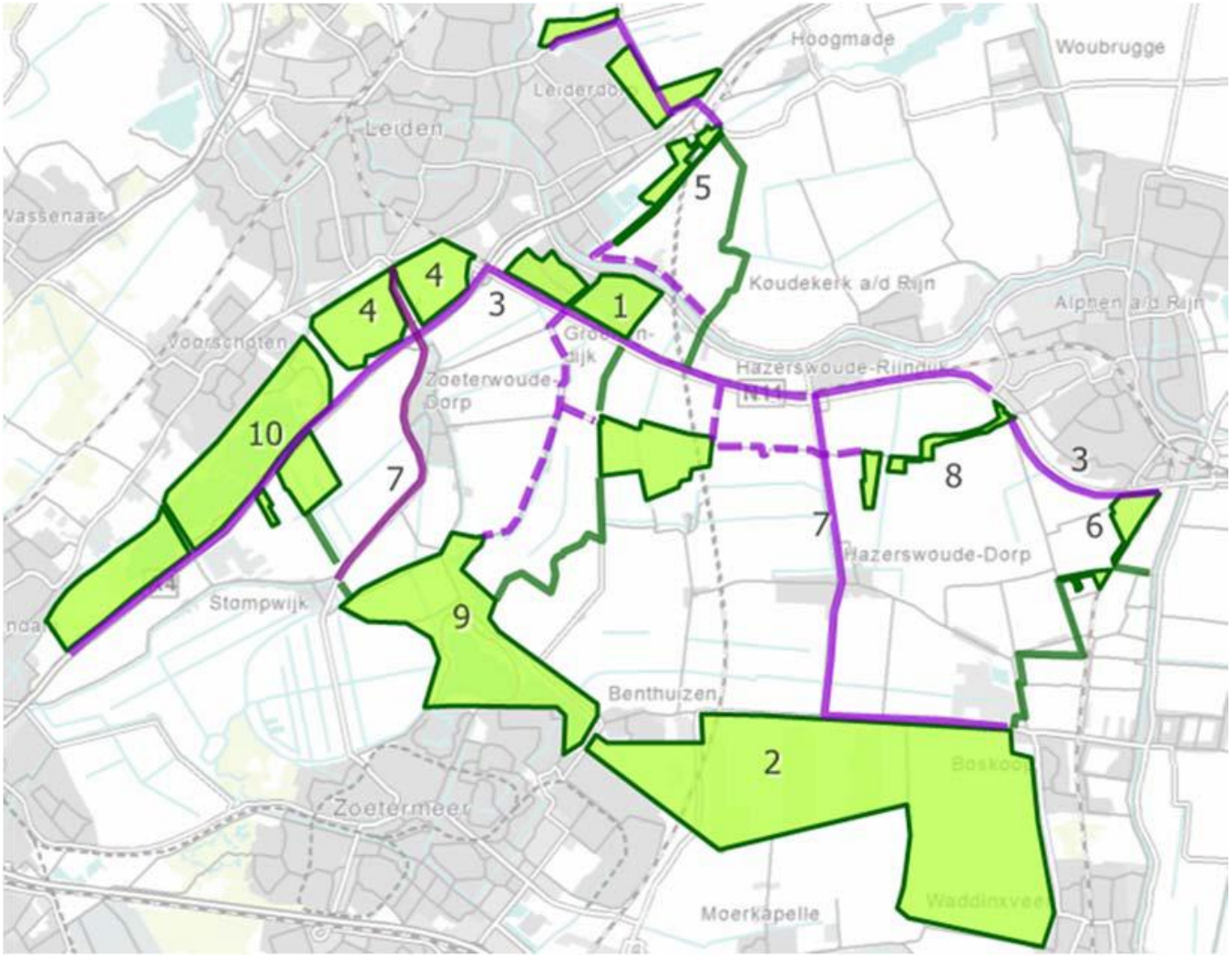
Areas where network partners planned measures (fall 2014)



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Van Rooij et al. 2014

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Partners in start-up phase

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Van Rooij et al. 2014

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Phase 1: awareness, what to do and new connections

ROLE	ACTIVITY
Facilitation (scientists, province)	• Bringing network actors together • Shared vision • Selection of appropriate measures
Financing (Province)	• Coordinating scientist • 2 workshops
Knowledge provider (Scientists)	• Guidelines for creating hubs and connections for a sustainable pollinator network
Example (Heineken)	• Reshaping Heineken plant area

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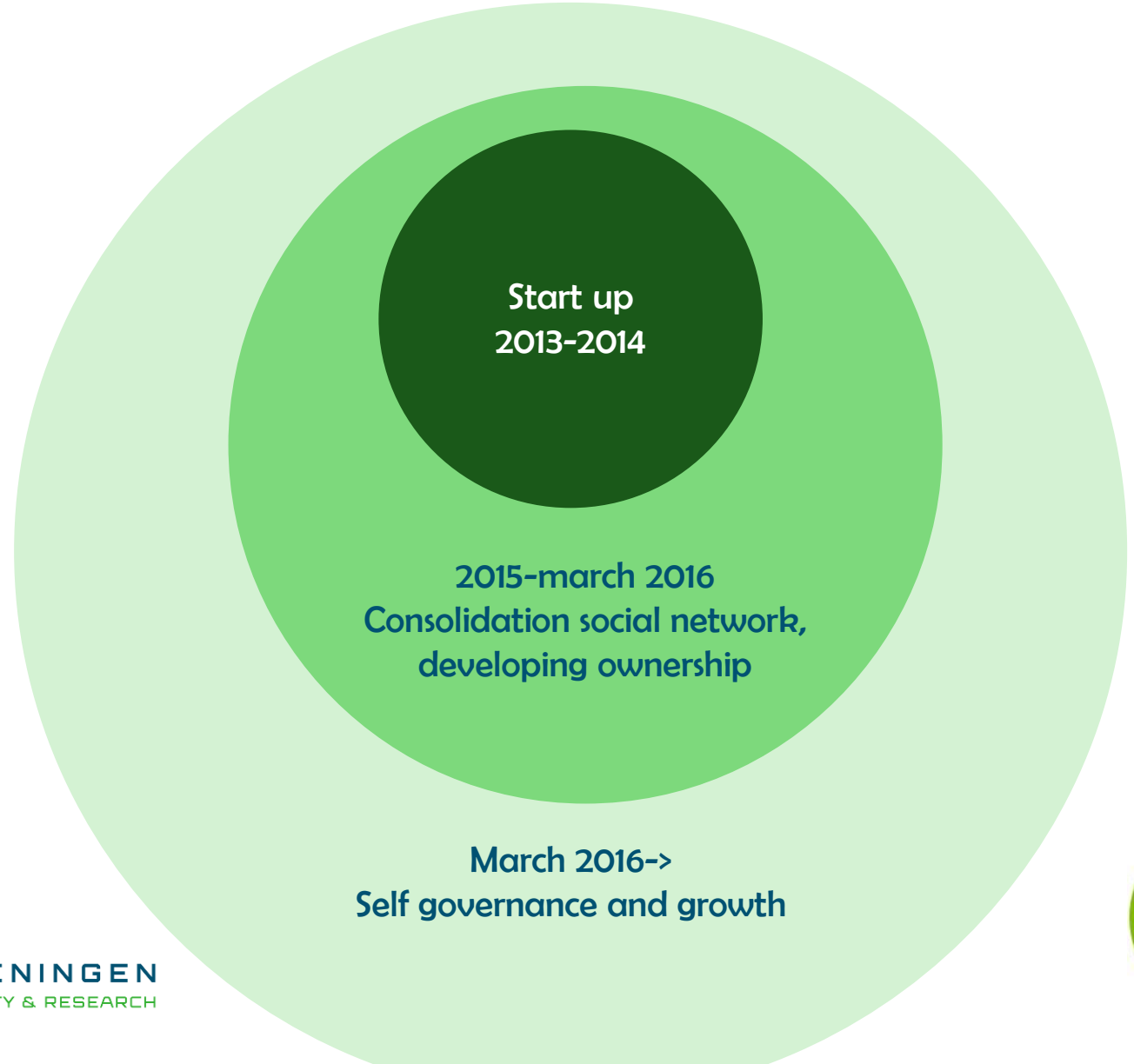
Three phases



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Phase 2: consolidation and building ownership

- External chair and coordinator
- Facilitate ambition document
- Create Helpdesk
- Start sub-network of road managers
- Training programme for green managers

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March 2016: 20 parties sign the ambition document; start public campaign

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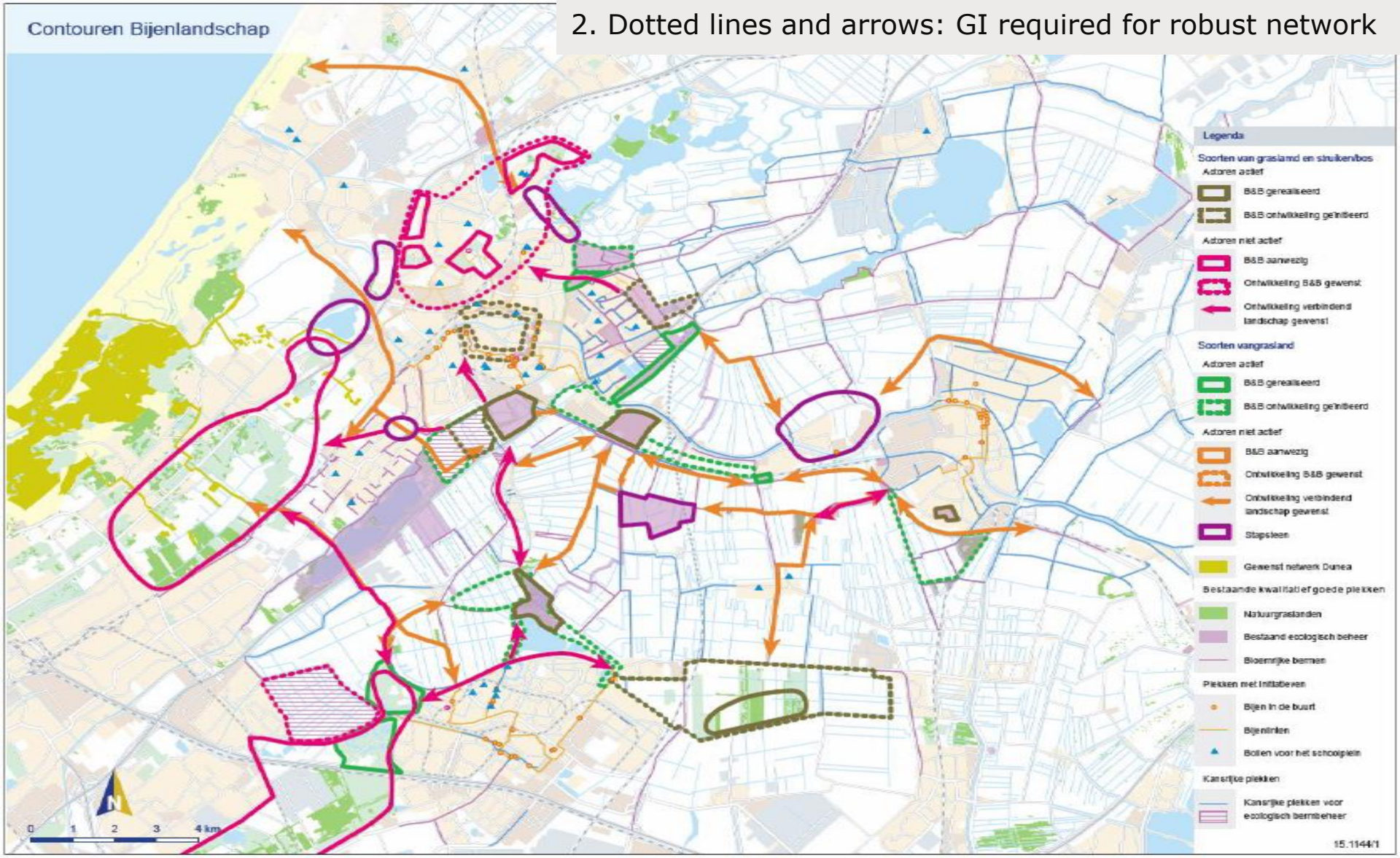
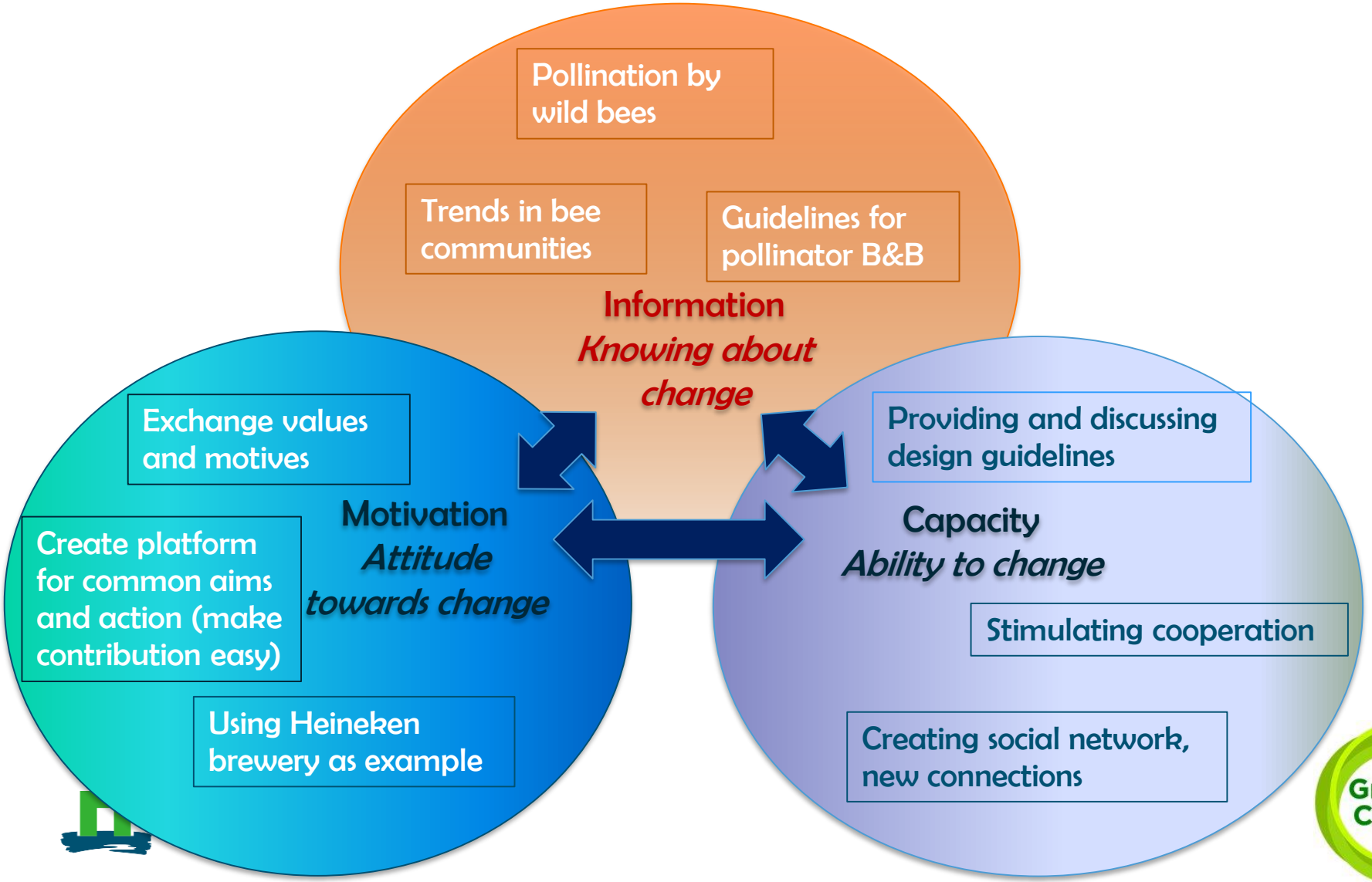
Ecological network: feed back of progress

1. Solid lines: GI already present
2. Dotted lines and arrows: GI required for robust network



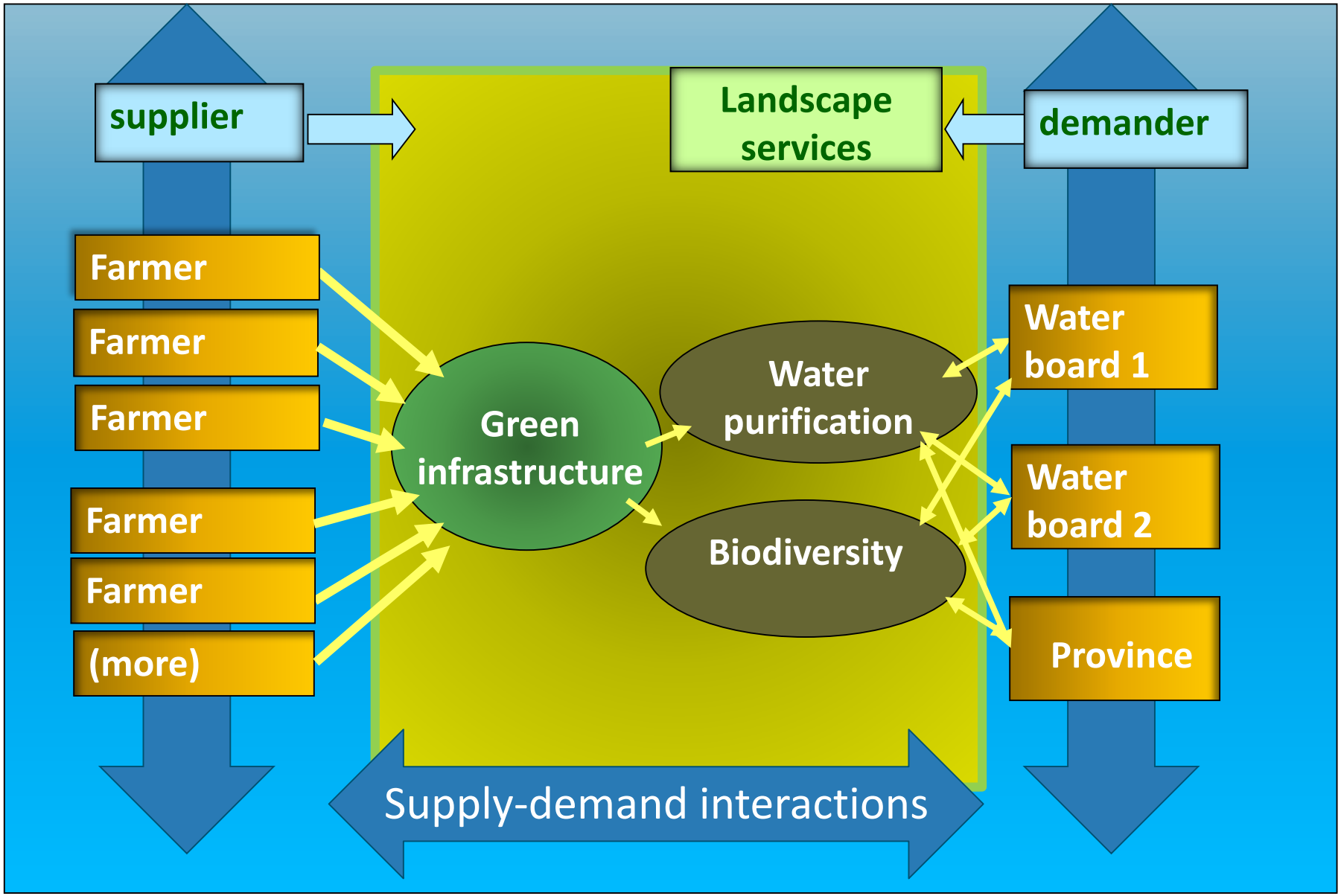
How contributed Green Circles partners to the transformation?



Gouwe Wiericke: food, water purification, biodiversity

Westerink et al. (2017) Land Use Policy 60:408-418

Gouwe Wiericke: process based on LS and roles of actors



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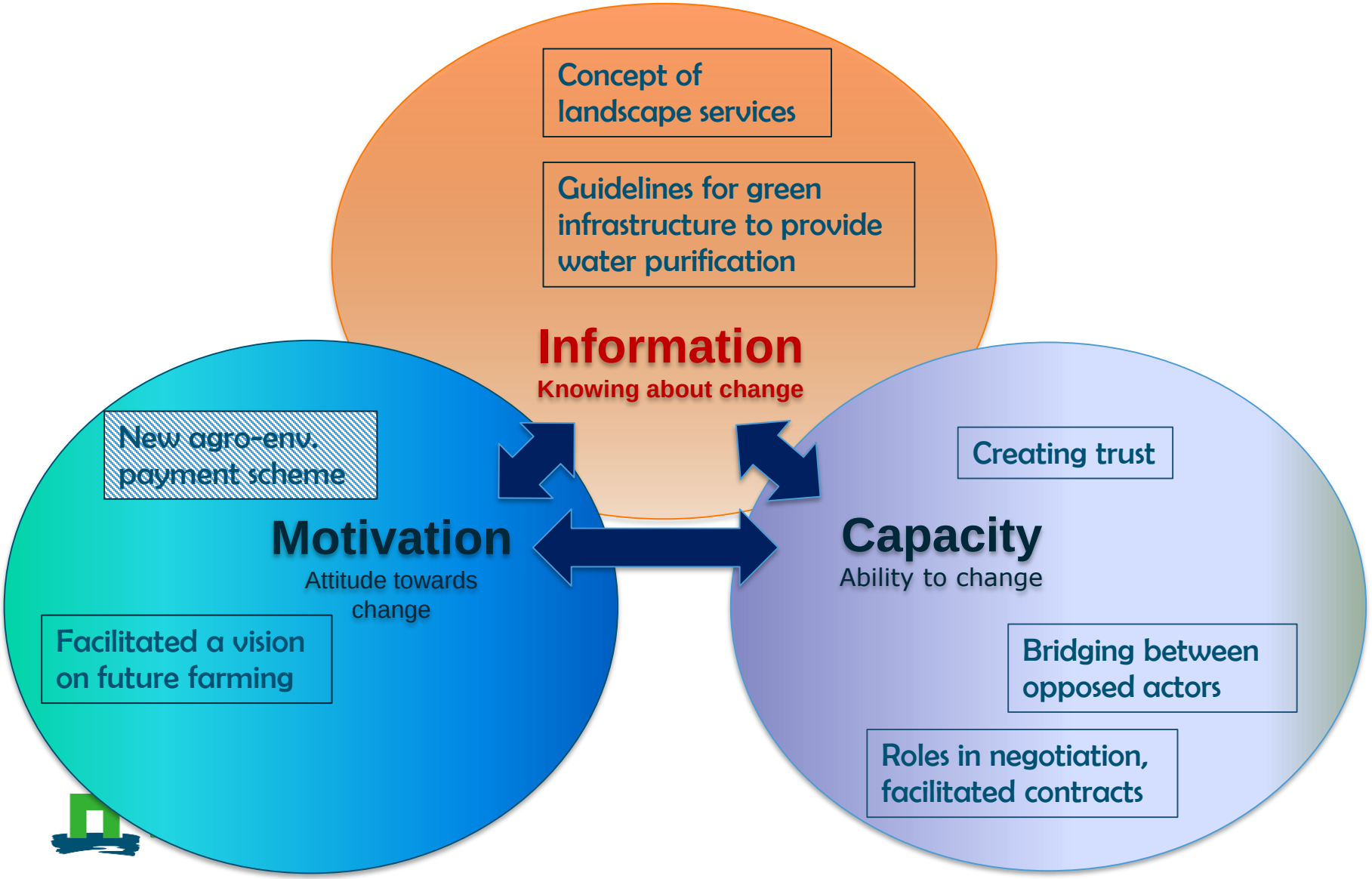
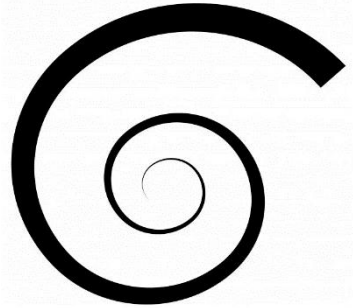
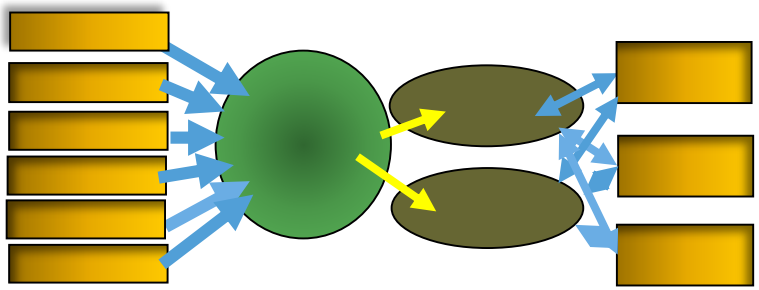


GC-pollinator network versus Gouwe Wiericke?

Expansion based on strong sense of urgency to do something for bees (no specific demand for LS)

Researchers created a negotiation process based on provision and demand of landscape services





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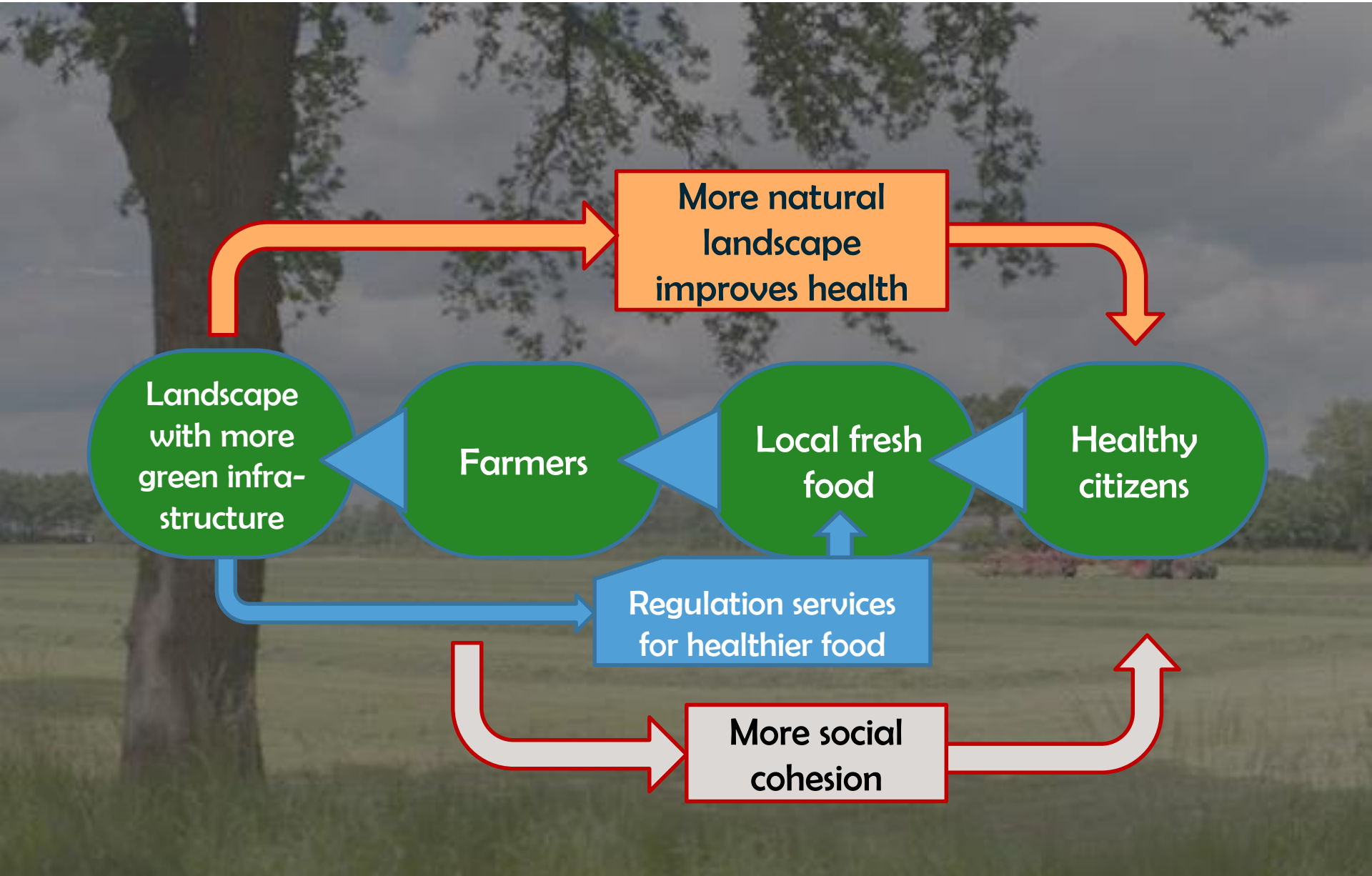
Brummen area

The Netherlands

Brummen: >>health landscape system approach



Starting up: motivating providers and beneficiaries of local fresh food

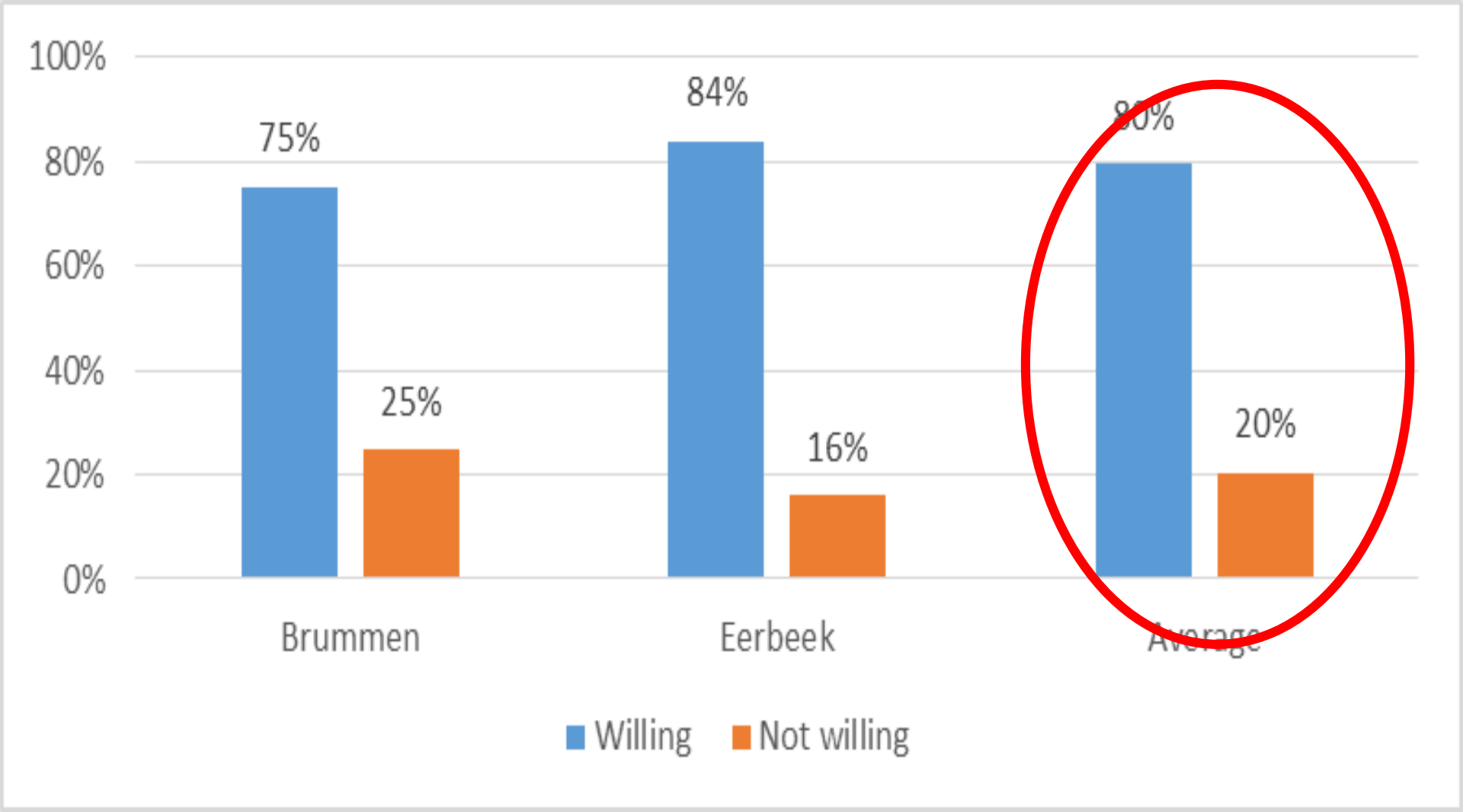
- Group of citizens takes the lead
- Frame: "Local food from your own landscape is more healthy"

- 4 Health care institutions (incl. hospital) as beneficiaries
- "Coocking with local fresh food is good for clients; the change can be made without extra costs"

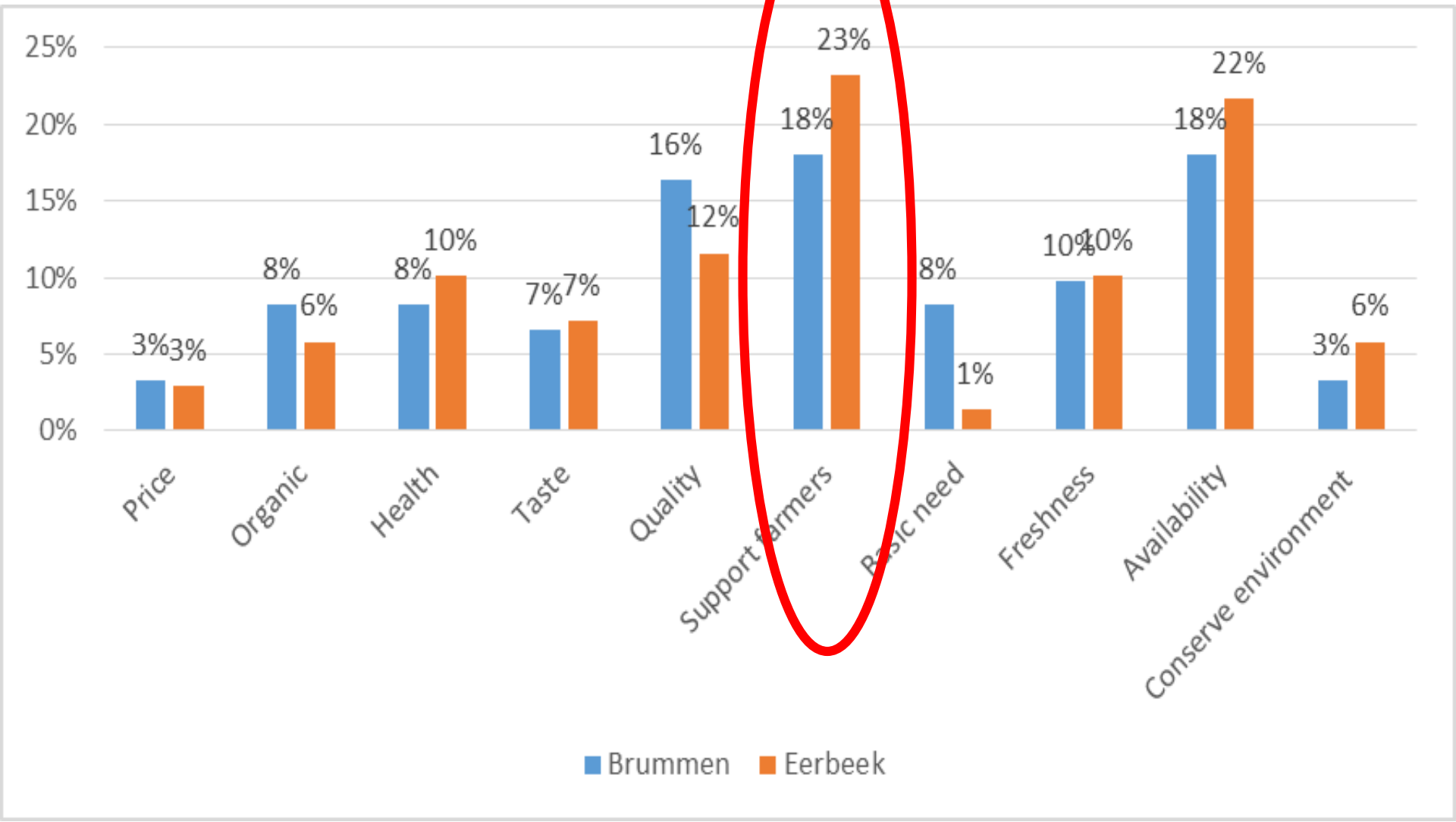
- Group of farmers as providers
- "Farms become more resilient: more markets, better price, better cope with future challenges"

Motivating the farmer: would local citizens pay for local food?

(162 interviews among buyers local supermarkets; research by Van Hall Larenstein University of Applied Science on request by LNB 2016)



Motivating the farmer: **why** would citizens pay for local food?



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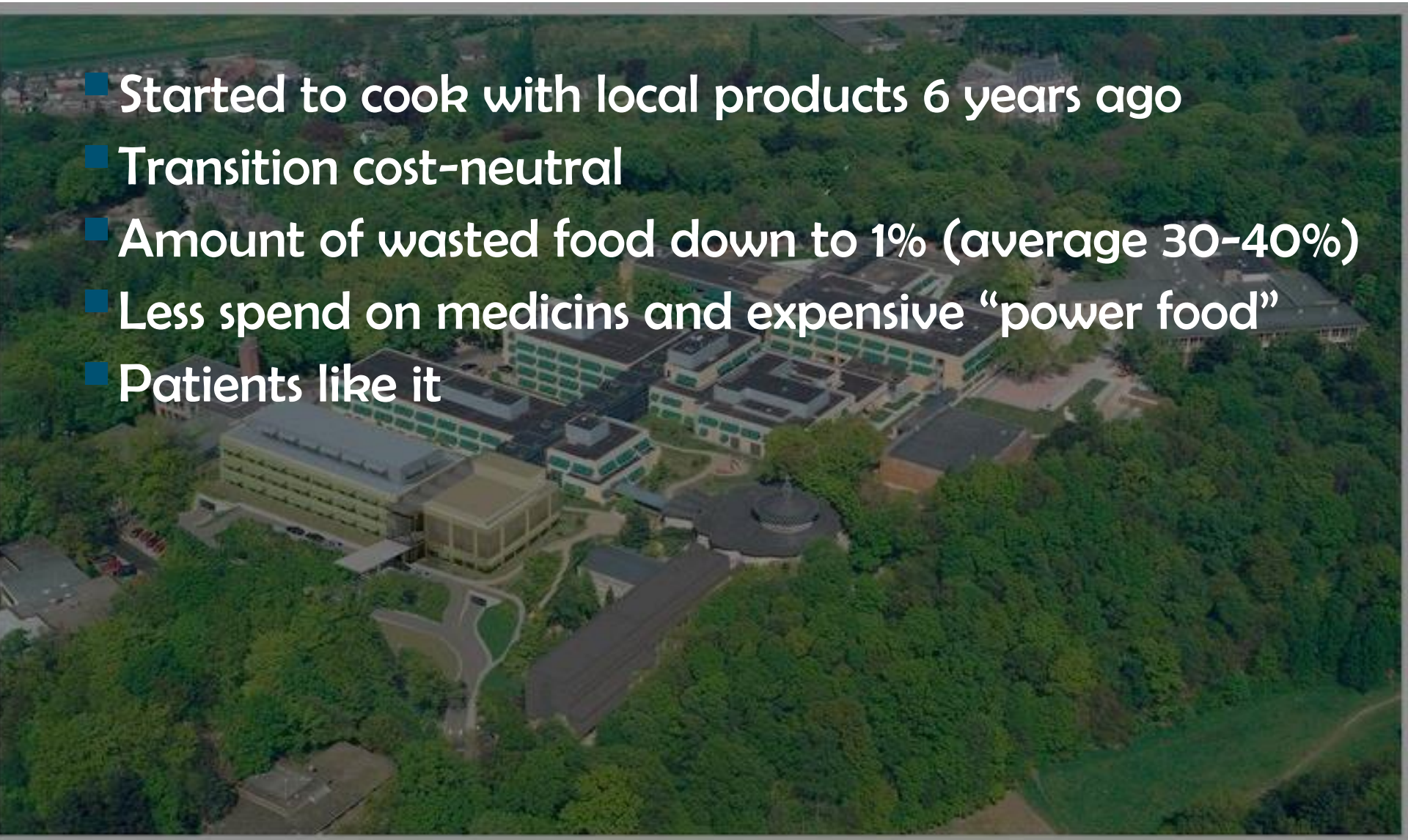
Motivating the health care institutions: example of Hospital "St Maartenskliniek" Nijmegen, NL



- Started to cook with local products 6 years ago
- Transition cost-neutral
- Amount of wasted food down to 1% (average 30-40%)
- Less spend on medicins and expensive "power food"
- Patients like it

Gezond en Lekker
uit de regio

In de Sint Maartenskliniek koken we met verschillende streekproducten. Waarom? Omdat het gebruik hiervan goed past binnen onze filosofie van optimale behandeling en gastvrijheid. Omdat streekproducten duurzaam, gezond en vers zijn. Maar bovenal omdat het gewoon lekker is.

Sint Maartenskliniek

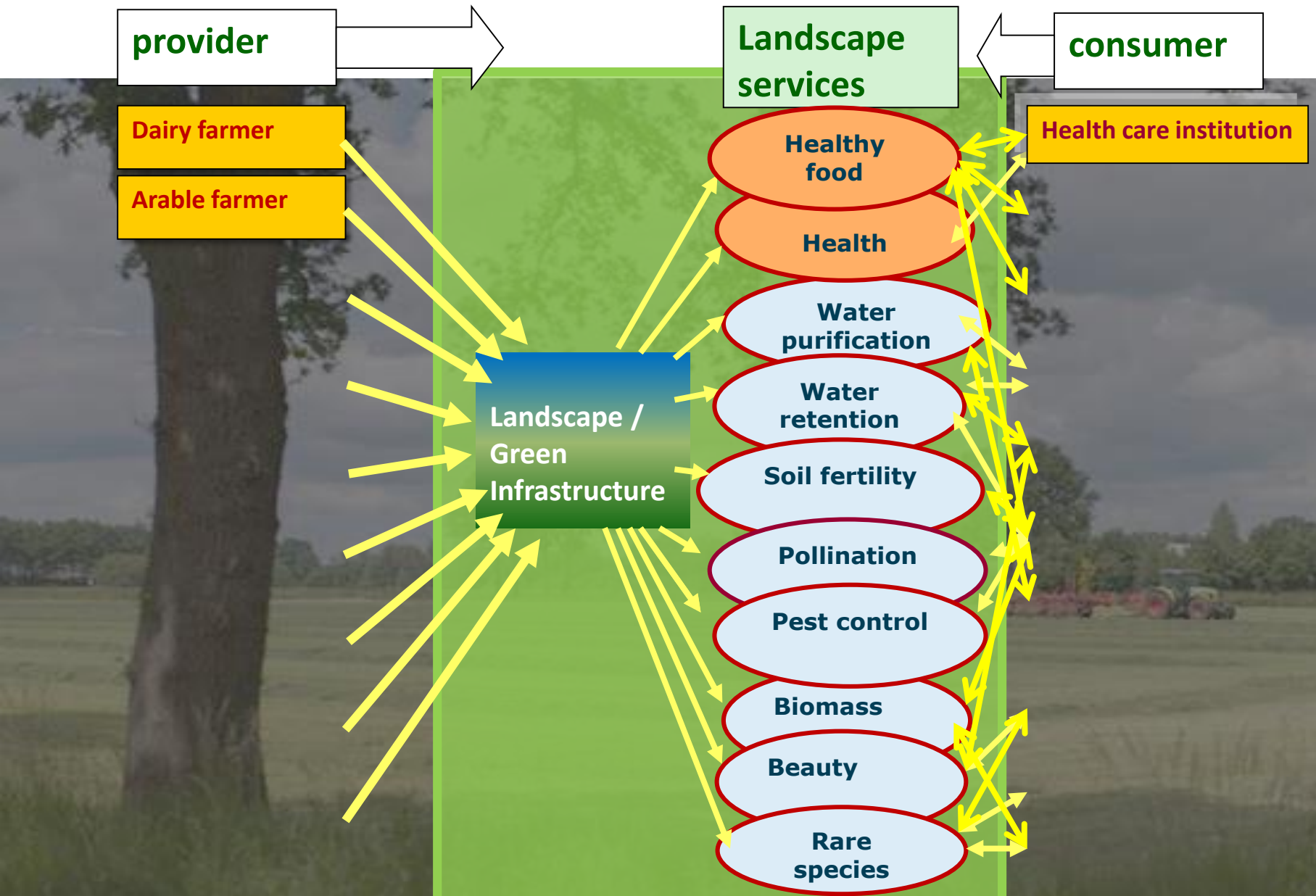
SINT MAARTENSKLINIEK BESTAAT *80 jaar!*

WE KIEZEN VOORAL VOOR STREEKPRODUCTEN OMDAT ZE LEKKER ZIJN

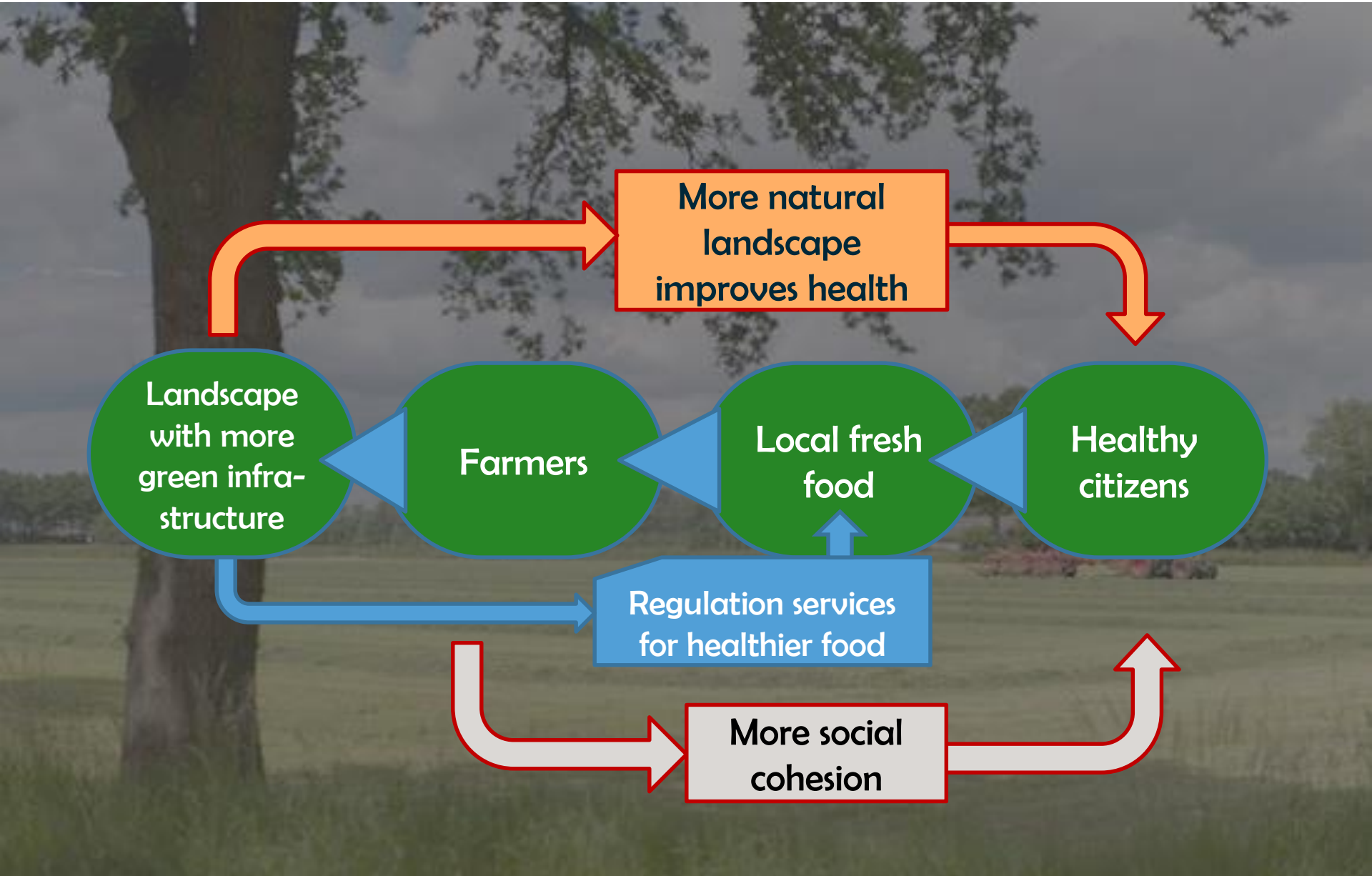
DE INGREDIENTEN VAN UW MAALTIJD ZIJN VERS BEREID

VOEDSEL UIT DE REGIO MAAKT MINDER KILOMETERS EN GEEFT DUS MINDER CO_2-UITSTOOT

Bringing farmers and health institutes together (Oct 2017)



Brummen: >>health landscape system approach

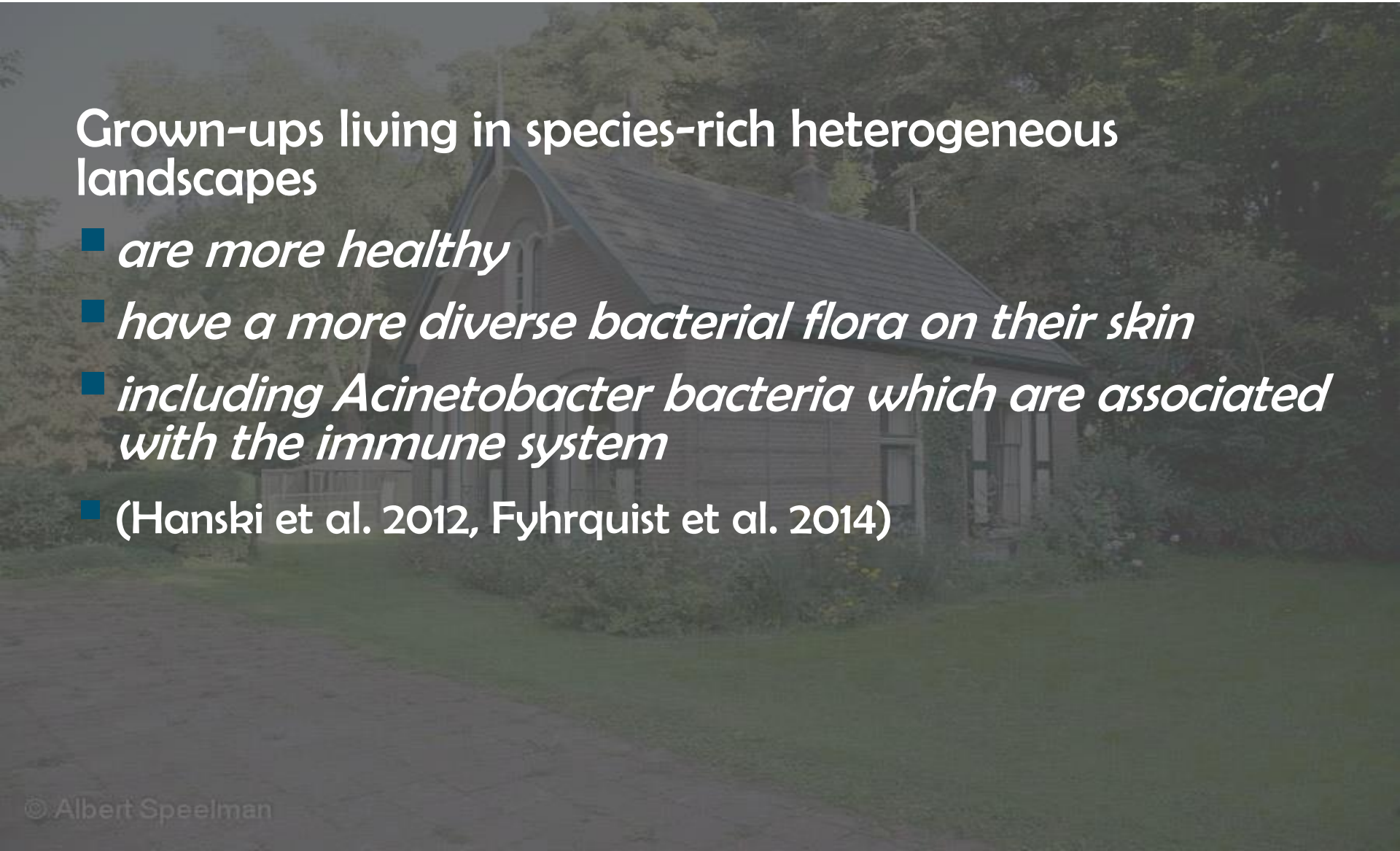


Informing about the health services of landscapes

- Organized a conference in June 2017 together with local health cooperation and municipality (>local food and landscape now in health policy of municipality)
- Will prepare a community workshop in November 2017 about the health services of landscapes including the benefits of local fresh food

Informing citizens about health services of landscapes

Diverse landscapes >> better human immune systems

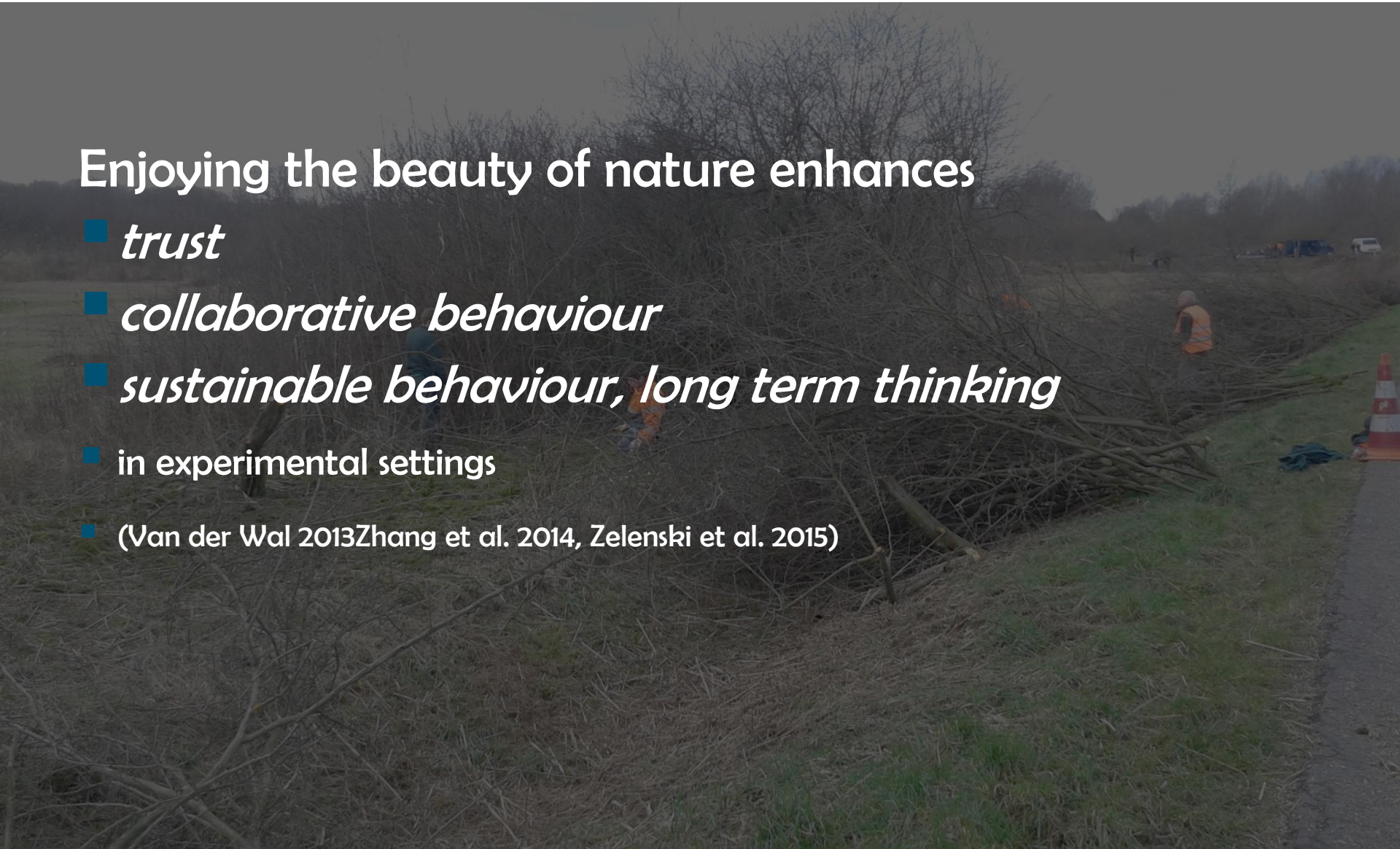


Grown-ups living in species-rich heterogeneous landscapes

- *are more healthy*
- *have a more diverse bacterial flora on their skin*
- *including Acinetobacter bacteria which are associated with the immune system*
- (Hanski et al. 2012, Fyhrquist et al. 2014)

Informing citizens about health services of landscapes:

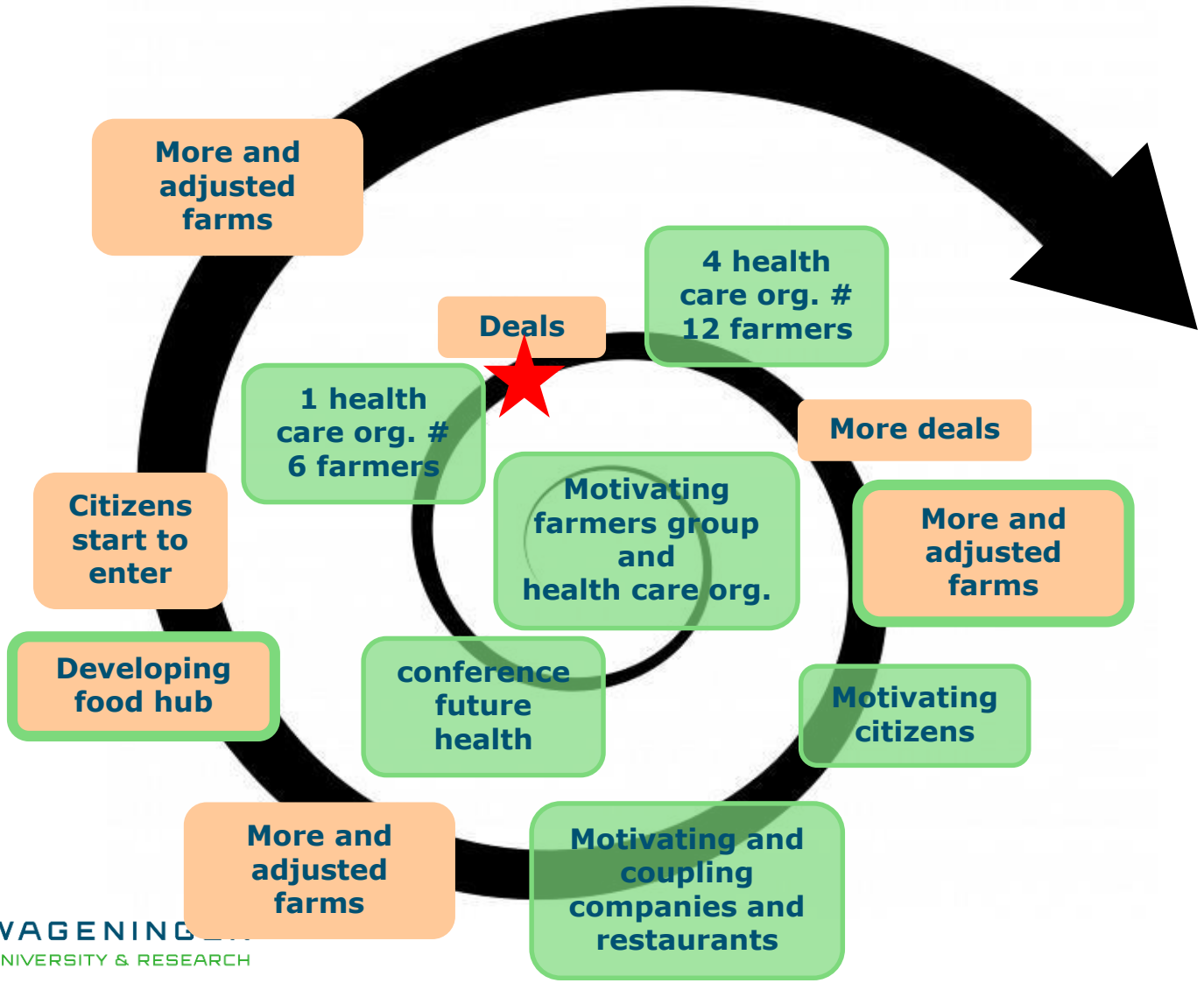
Nature fosters social participation



Enjoying the beauty of nature enhances

- *trust*
- *collaborative behaviour*
- *sustainable behaviour, long term thinking*
- in experimental settings
- (Van der Wal 2013Zhang et al. 2014, Zelenski et al. 2015)

Brummen health landscape: will the flywheel strategy be effective?



What we think did happen

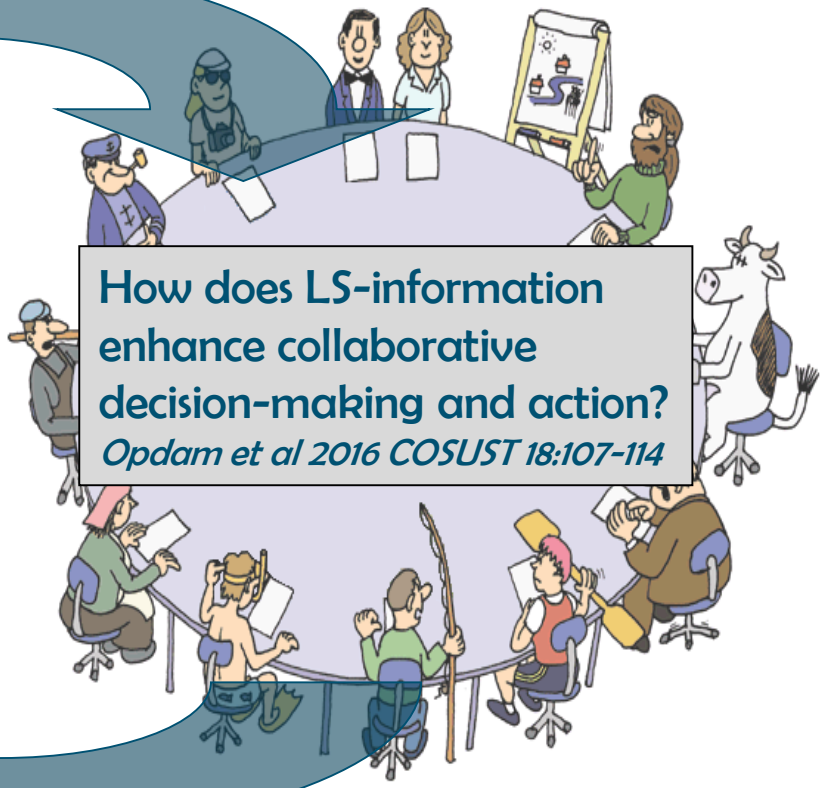
Using landscape services in a participatory process

1. Improved understanding of common dependency on landscape scale patterns and processes
2. Strengthened the social network as it helps to cross sector boundaries and to create new bonds
3. Therefore enhances collaborative decision making and collaborative interventions

4 scientific challenges

Collaborative valuation of LS
(Liu & Opdam 2015 Landscape Ecology)

How do LS-benefits depend on landscape pattern? Linear? S-shaped?



How does LS-information enhance collaborative decision-making and action?
Opdam et al 2016 COSUST 18:107-114

Does improving landscapes for LS lead to more sustainable landscapes?

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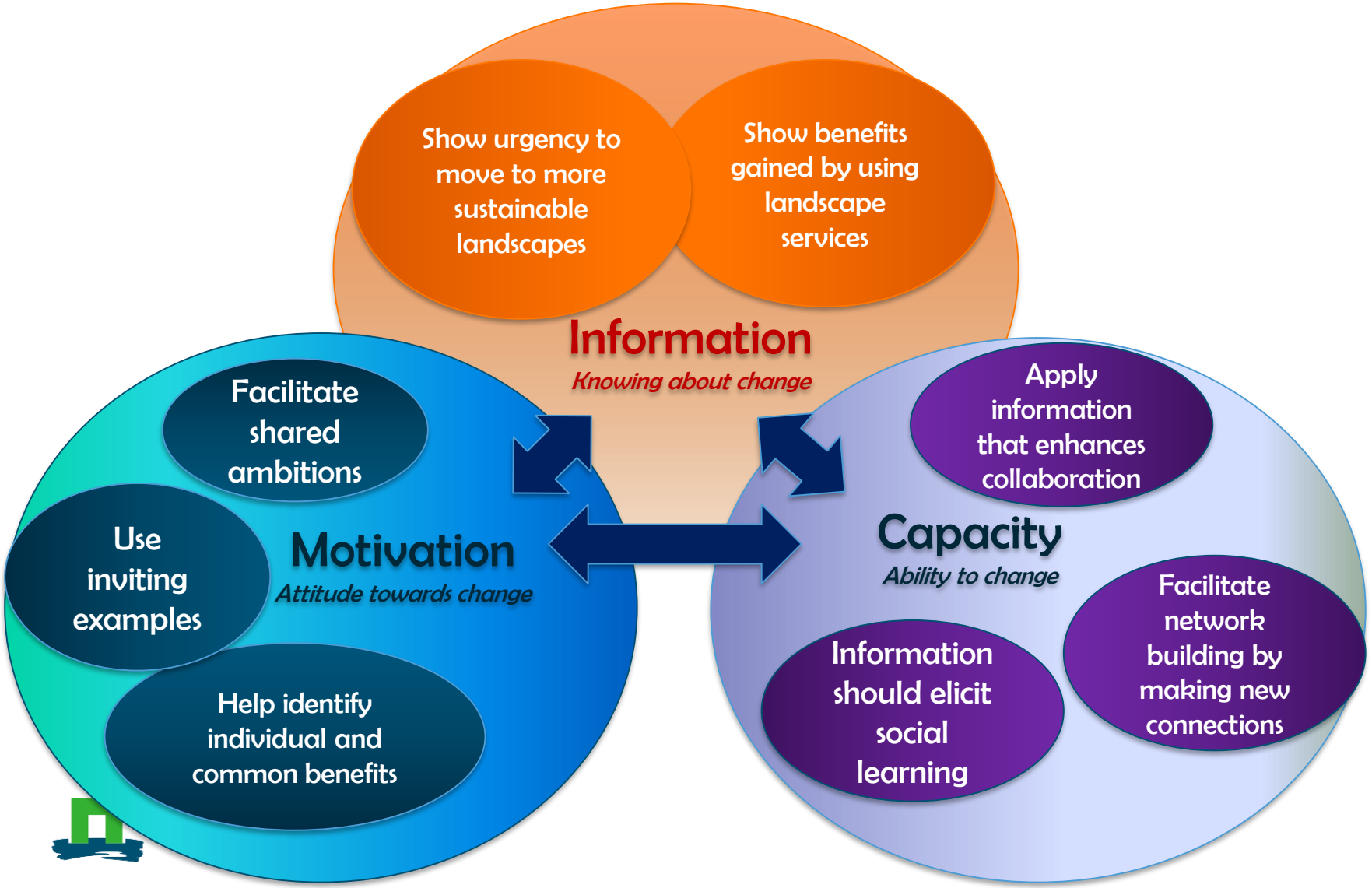
Recommendations: how scientists can stimulate transformations



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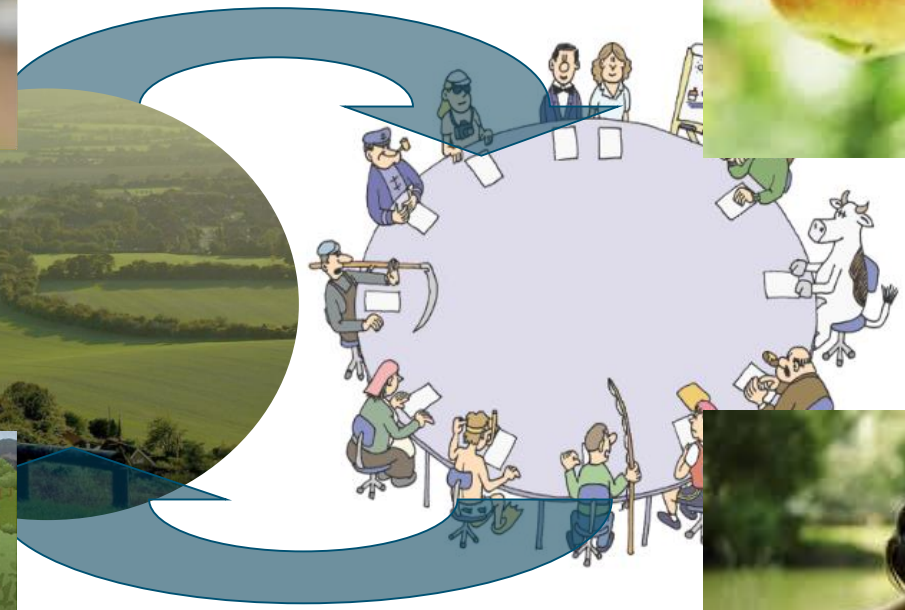

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