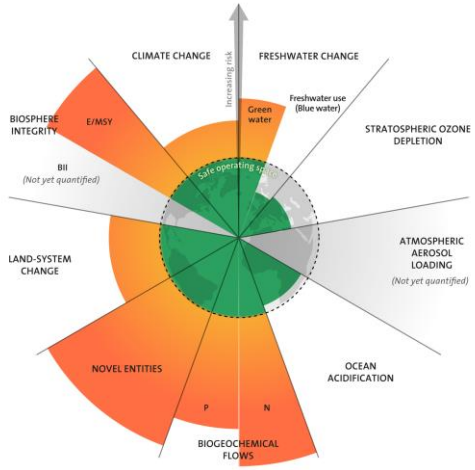
European Summit 2025
Leeuwarden

Ambition Table Closing the Nutrient Cycle (SNuK)

Circulair Friesland

Why SNuK?

HEALTHY SOIL



CLIMATE CHANGE

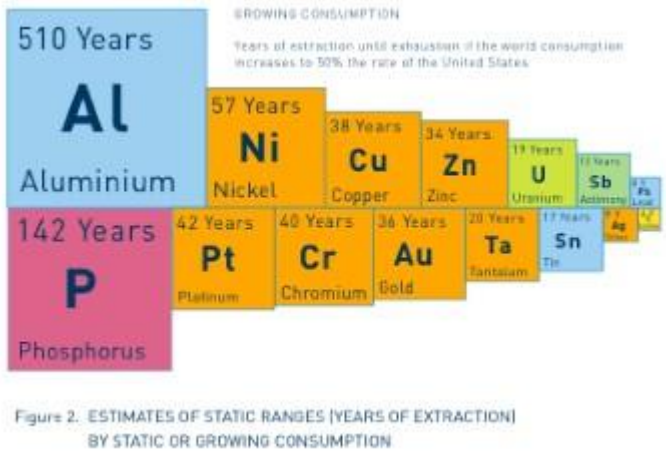


Figure 2. ESTIMATES OF STATIC RANGES (YEARS OF EXTRACTION) BY STATIC OR GROWING CONSUMPTION

NUTRIËNT SCARCITY

- Greenhouse gas emissions
- Nitrogen emissions
- Water quality

Plants need more than CO_2 en H_2O

N	P	K	Mg
Ca	S	Fe	Mn
Zn	Ni	Cl	Mo
	B	Cu	

23 Key nutrients for a healthy population

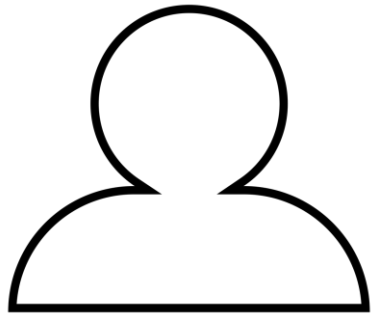
N	P	K	Mg
Ca	S	Fe	Mn
Zn	Ni	Cl	Mo
	B	Cu	

+

Co	Na	Se	I
Cr	V	Sn	As
F			

14

23 (14+9)



NUTRIËNT SCARCITY

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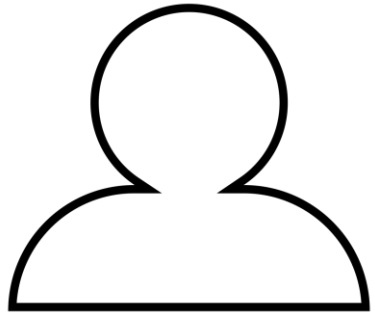
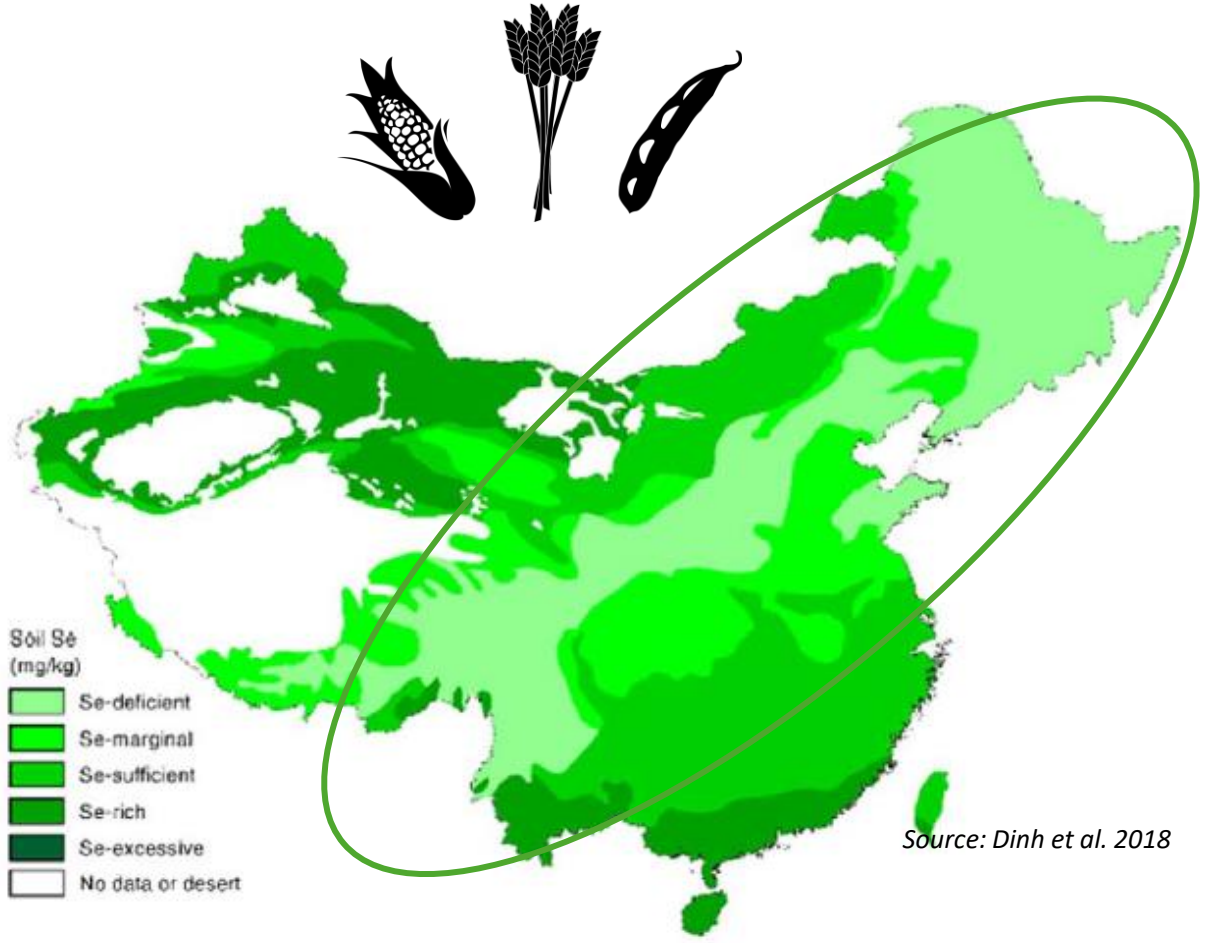


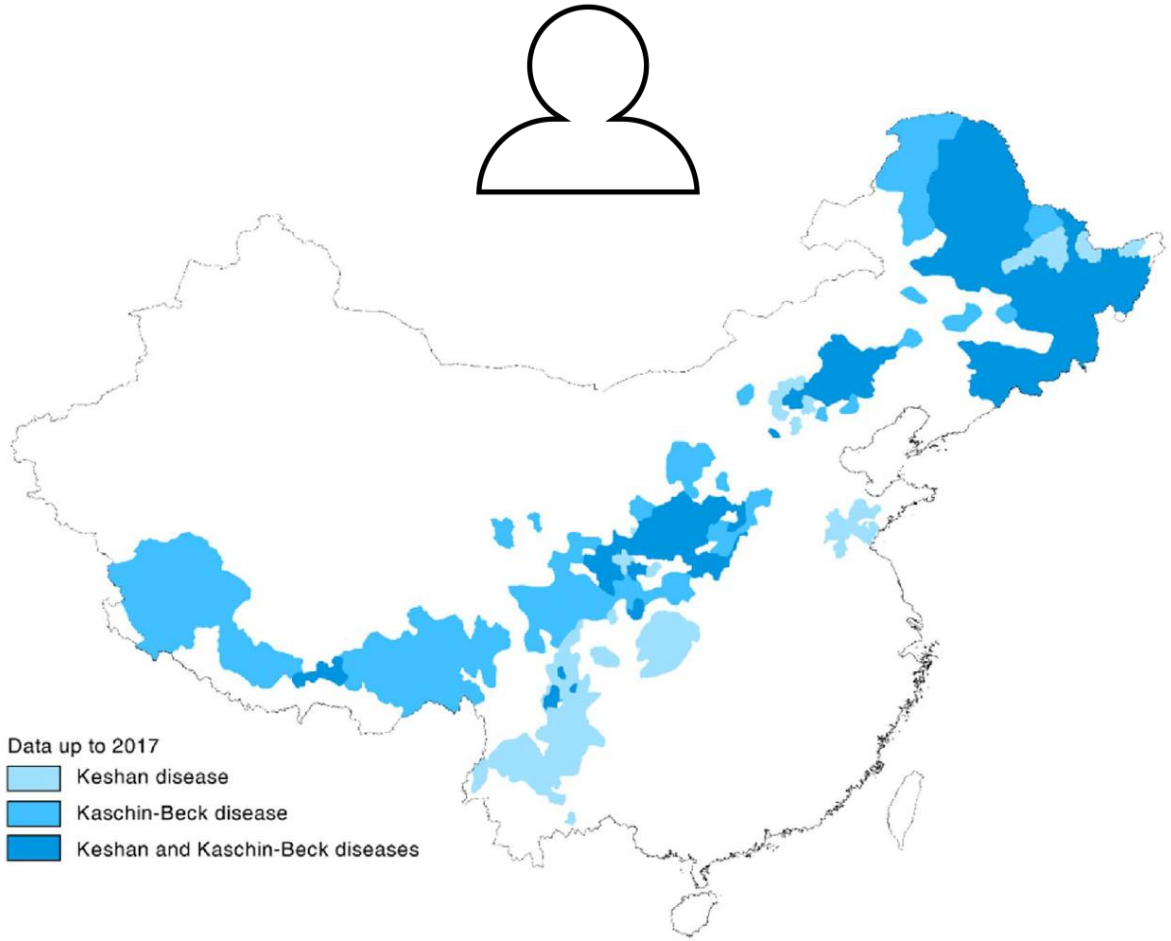
NUTRIËNT SCARCITY

Link between Se deficiency in soils and Se-related diseases in China

Se



Source: Dinh et al. 2018



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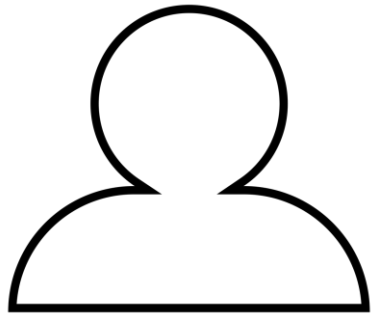
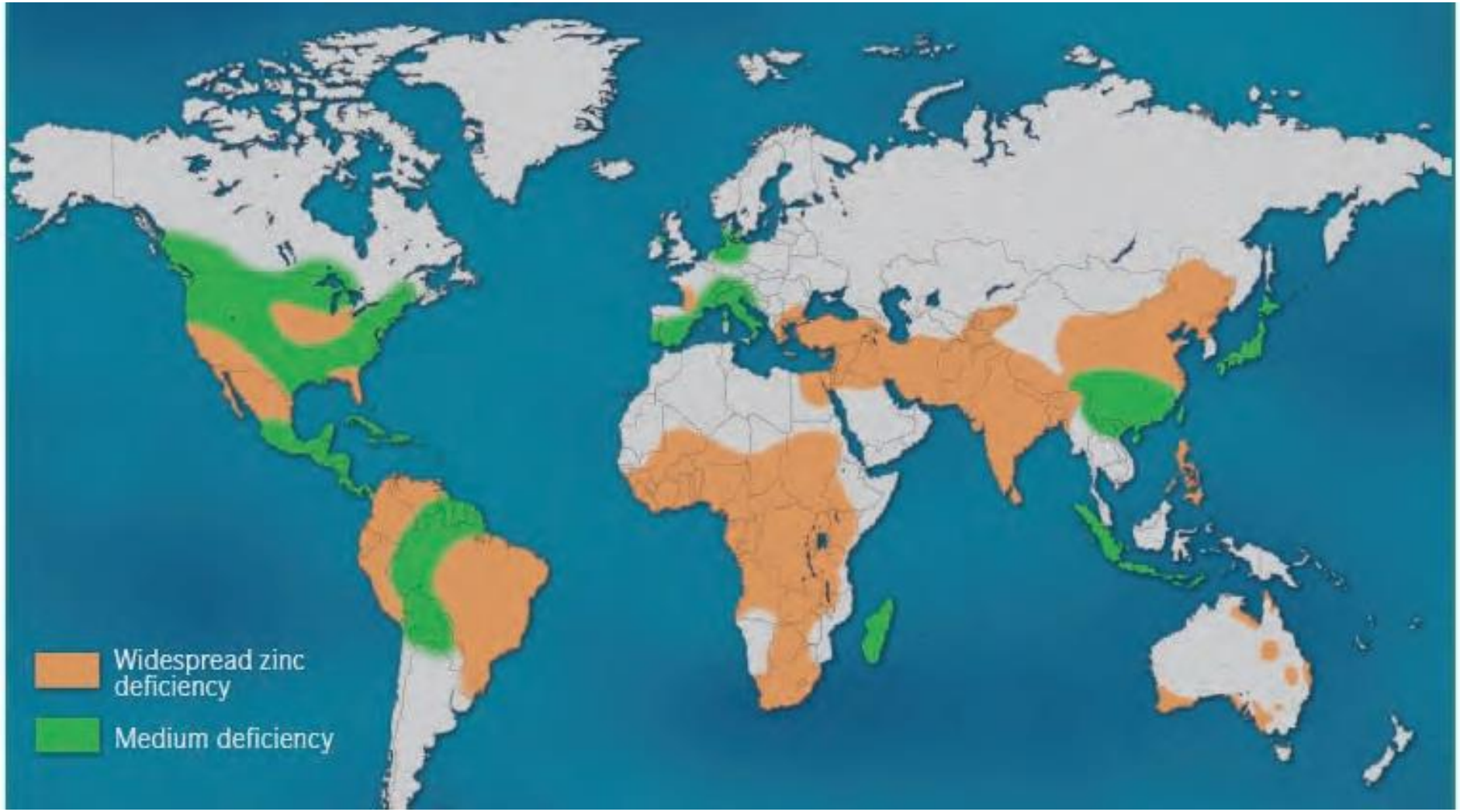


NUTRIËNT SCARCITY

Zinc deficiencies

Zn



Source: Alloway 2004

Scarce elements

Reserves in years

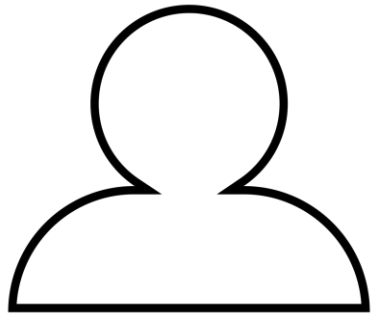
	370	288	
N	P	K	Mg
Ca	S	Fe	Mn
Zn	Ni	Cl	Mo
19	B	Cu	44
	46	60	

+

		49	
Co	Na	Se	I
Cr	V	Sn	As
F			

14

23 (14+9)



NUTRIËNT MATERIAL SCARCITY

(NOT) HEALTHY SOIL

Due to

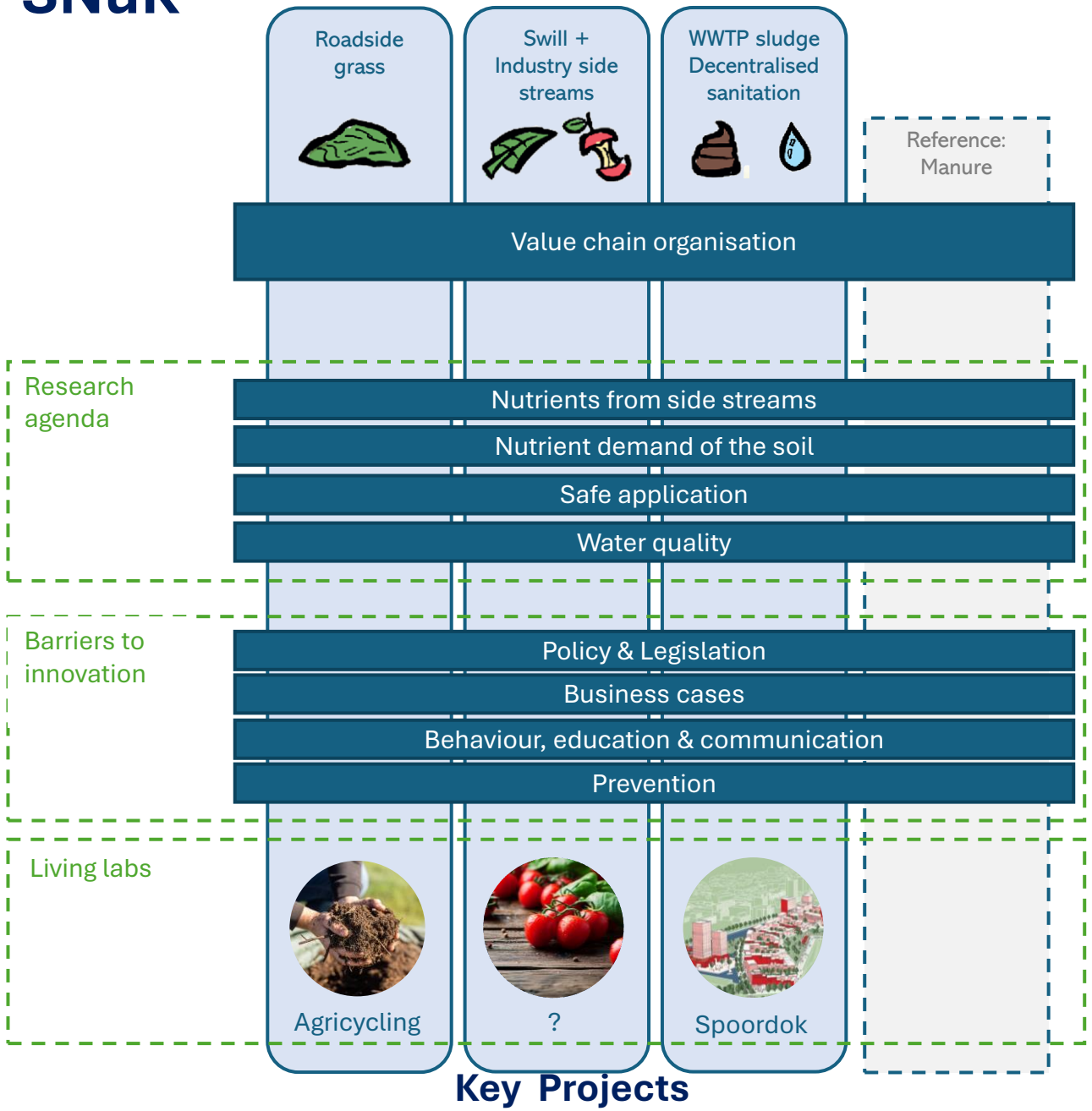
1. Nutrient Depletion
Overfarming or monoculture
2. Soil Erosion
Deforestation, overgrazing, and improper plowing.
3. Chemical Contamination
Overuse of chemical fertilizers, pesticides, or industrial waste.
4. Salinization
Poor irrigation practices, especially in dry climates.
5. Compaction
Heavy machinery or overgrazing.
6. Loss of Organic Matter
Lack of crop rotation, excessive tillage, or not adding compost/manure.
7. Pollution
Industrial spills, mining, or dumping of waste.

Impact
- On soil life
- Carbon availability
- Water retention

Ambition Table SNuK

- The primary objectives are to enhance soil biodiversity, eliminate nutrient loss and improving the economical position of the farmers.
- Through collaboration between farmers, businesses, governments and researchers.

SNuK



Scope. Circular value chain organisation, focussed on implementing knowledge and overcoming barriers through key-projects

Why in Friesland

Traditionally a region with a lot of agriculture that ensures a strong connection between city and countryside.

Mission SNuK is to make a significant contribution to a future-proof model for our food supply.

I. Healthy soil will lead to healthy food for healthy people. Both by and for farmers, government, knowledge institutions and business community,

II. We work together on broad prosperity, a fair transition and a healthy earning model for farmers.

III. Locally extracted raw materials from biomass flows make an important contribution to this.

Barriers

Legislation the use of biomass streams for agricultural use is limited by law. How can we speed up the process of admittance without losing caution and/ or endangering the safety issues.

Communication what is the best approach to convince society that the use of human excreta is safe and sound for the ground (=soil). The current attitude towards human excreta is negative and prevents it of being allowed in society.