Use of biomass

Cluster 5 of Food Pro·tec·ts pursues the goal of developing concepts and technologies for the conversion of previously poorly used or unused biomass material flows into high-quality products.

The activities are based on the bio-economic strategy, which is oriented towards natural material cycles and aims to contribute to a structural change from an economy based on finite fossil sources to an economy based more strongly on renewable resources.

Food production technologies for trans-boundary systems

Food Pro·tec·ts is designed to bring top class technology innovation right into the heart of both the Dutch and German corporate landscape.

In the project, entrepreneurs from both countries cooperate with innovation experts in different clusters with the aim of jointly developing new technologies and learning how to use them.

www.foodprotects.eu

food
PRO·TEC·TS

LOCAL NUTRIENT CIRCULARITY

Restoring nutrient circularity
in the Kleve district

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Project partners Cluster 5

GIQS — Grenzüberschreitende Integrierte Qualitätssicherung e.V.

Gemeente Venray

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Hochschule Bonn-Rhein-Sieg — University of Applied Sciences

HOCHSCHULE RHEIN-WAAL — Rhine-Waal University of Applied Sciences

NGN — new generation nutrition

SOEPENBERG since 1954

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provincie Gelderland

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Project objection

We aim to develop scenarios for more circular nutrient management through determining the current nitrogen (N), phosphorus (P), potassium (K) and carbon stocks and flows and making an inventory of which technologies are available locally and which system changes might pose potential for the agro-food-waste system of district Cleves. We focus on nitrogen, phosphorus, potassium and carbon as optimal nutrient use efficiency relies on obtaining the optimal stoichiometric balance.

Cluster 5
Material and energetic
use of biomass

Processinnovation

So far research on improved nutrient circularity of agro-food-waste systems on local scales has been on phosphorus, and to a lesser extent on nitrogen. holistic considerations are missing.

With our research results, we want to support the implementation of innovations to improve the circular economy for nutrients.

Motivation

Through developing scenarios we can provide local decision makers with insight into which adaptations can contribute to restoring local nutrient circularity. Restoring nutrient circularity on a local scale in turn contributes to decreasing dependency on (non-renewable) nutrient inputs into the district (conserving non-renewable resources), minimizing nutrient losses to the environment from the agro-food-waste system (eutrophication, organic matter depletion of agricultural soils) and lastly support the implementation of technologies (support local economy).

Nutrient stock and flow mapping

This model represents the local agro-food-waste system in district Cleves. The subsystems exchange biomasses containing important nutrients. Some of these flows or generated stocks are not used to their full potential. The identification and quantification of these stocks and flows through a substance flow analysis (SFA) gives insight into so-called hotspots, areas in which there is potential to improve local nutrient use. Performing scenario analyses including different technologies or system changes can assess the effect of adaptations on nutrient stocks and flows.
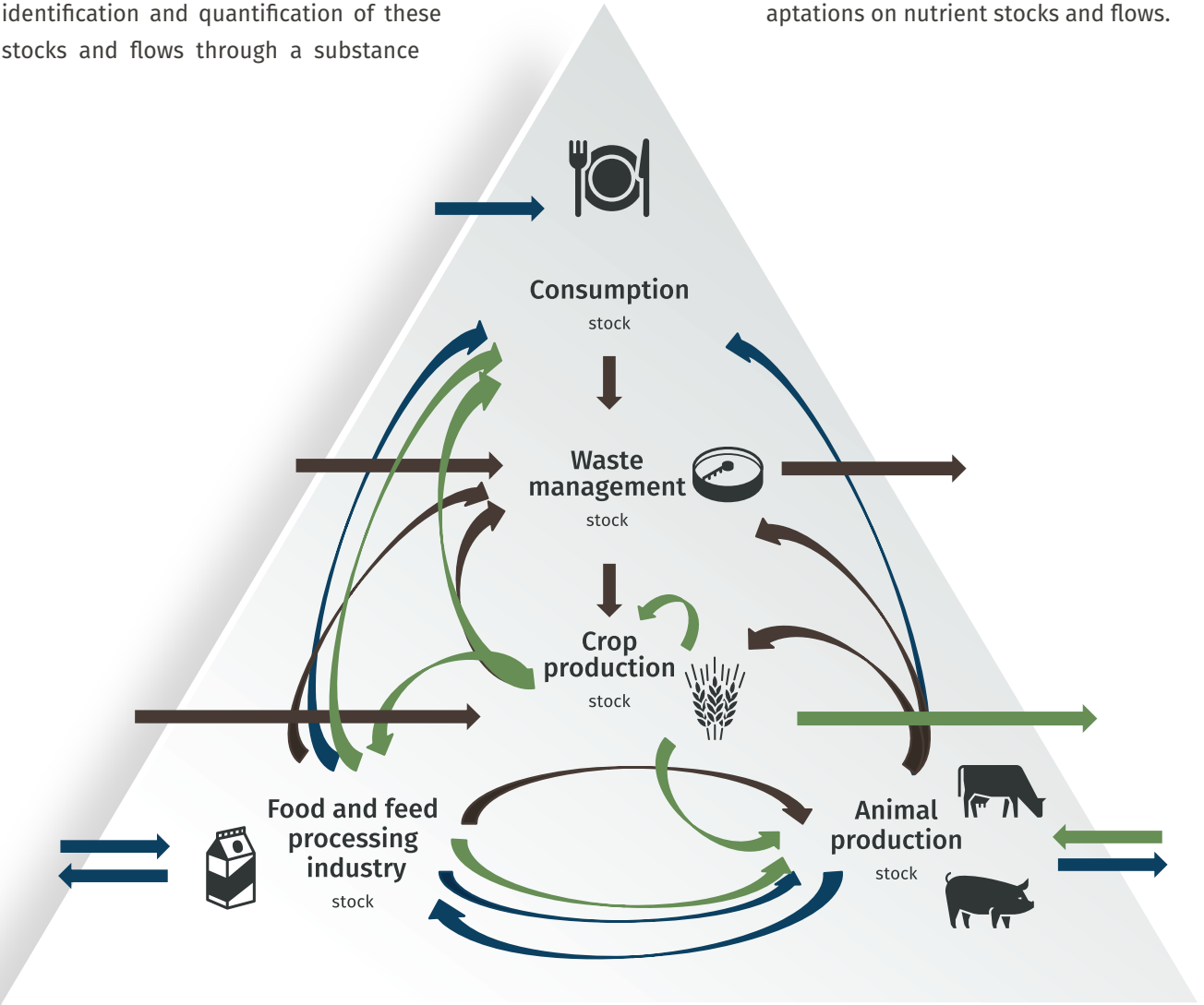
CIRCULAR ECONOMY

Benefits for consumer & society

Ultimately a circular use of nutrients supports food security through a decreased dependency on finite nutrient resources and reduced nutrient losses limit local environmental and health issues.

Benefits for economy & society

Dependency on nutrient imports is decreased and nutrient availability for food production is stabilized through local sourcing. Through determining the current nitrogen, phosphorus, potassium and carbon stocks and flows and making an inventory of which technologies are available locally, we give local economy insight into possible cooperation pathways between nutrient supplier and demander and technology holder and biomass producer.