



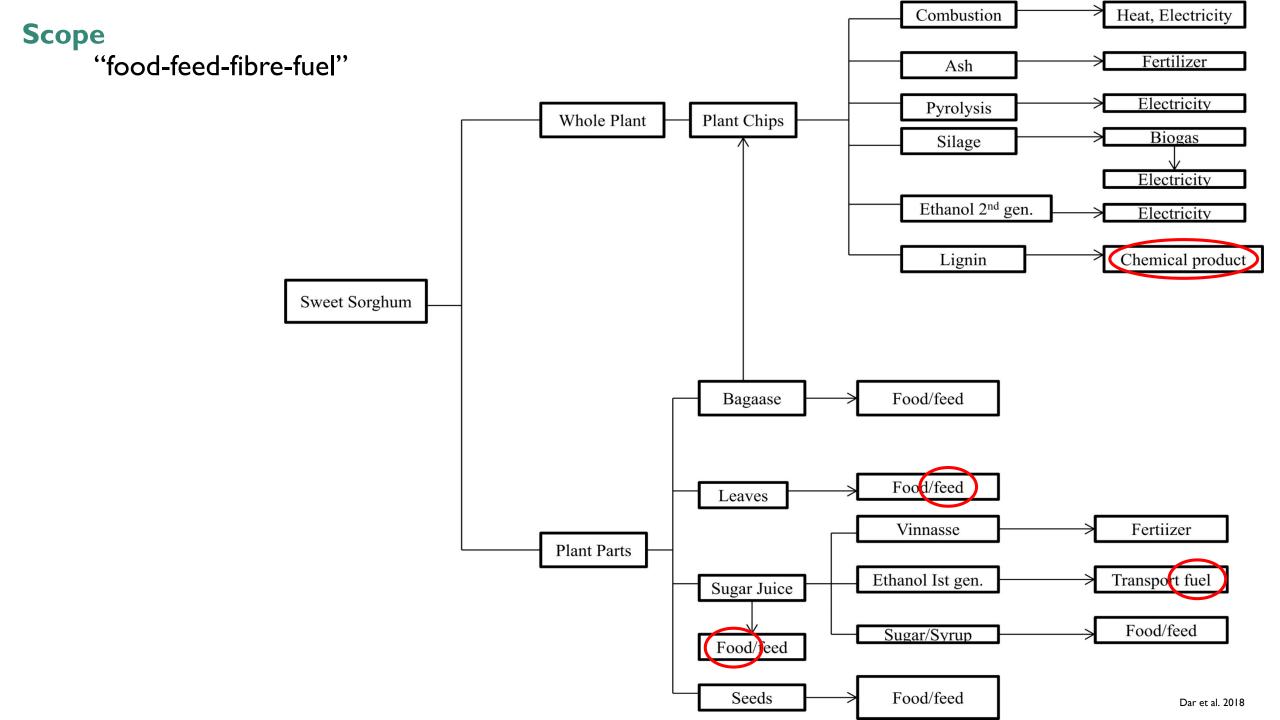
Scale, Scope, Functions, Performance Measures and Circular Food Systems

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Circular@WUR – Webinar on Theme 1: Biosphere

Online, 3.2.2021

Scale plot-farm-landscape-nation-global **TAMRIA** ZIMBABWE NAMIBIA BOTSWANA SWAZILAND LESOTHO SOUTH AFRICA



Scope

annual crops
perennial crops
grasslands
livestock
fish
insects
artificial meat,
vertical farming











Scope

Continuum from Agriculture to Health

- Agriculture
- Food supply
- Food Service
- Food
- Nutrition
- - Health
- Promotion
- Protection
- Treatment
- Restore

- Food production
- Nutrition orientation for healthy diet
- Food, feed and fuel and bio-products
- Climate changes

- Food quality
- Food safety
 (Consumer and Trade)
- Nutrient needs
- Dietary intakes
- Nutritional wellbeing
- Nutrition literacy

- Safe from Hazards
- Good health
- Restore

Food Security

Food and Nutrition Education

Food Culture

Beyond the boundary Boundary not quantified **Functions and demand** Climate change What does the food system ECOLOGICAL CEILING deliver and what do we need from it? SOCIAL FOUNDATION Supporting or intermediate services Final services Go **Biophysical** structure or process Ecosystem function Freshwater withdrawals Land conversion Ecosystem **ECOSYSTEM SERVICES** service Provisioning FOOD Limit pressures FRESH WATER Benefit WOOD AND FIBER via policy society action Regulating Supporting CLIMATE REGULATION NUTRIENT CYCLING Value FLOOD REGULATION SOIL FORMATION ∑ Pressures DISEASE REGULATION PRIMARY PRODUCTION WATER PURIFICATION Cultural ACCESS TO CLEAN AIR AND WATER AESTHETIC SPIRITUAL EDUCATIONAL RECREATIONAL Good social relations SOCIAL COHESION MUTUAL RESPECT ABILITY TO HELP OTHERS LIFE ON EARTH - BIODIVERSITY Source: Millennium Ecosystem Assessment ARROW'S COLOR Potential for mediation by Intensity of linkages between ecosystem services and human well-being Medium Millennium Ecosystem Assessment 2005; Potschin and Haynes-Young 2016; Raworth 2017 Strong

Performance

Biomass yields per ha and year





Total human edible protein from a larger area averaged over crop rotations/several years

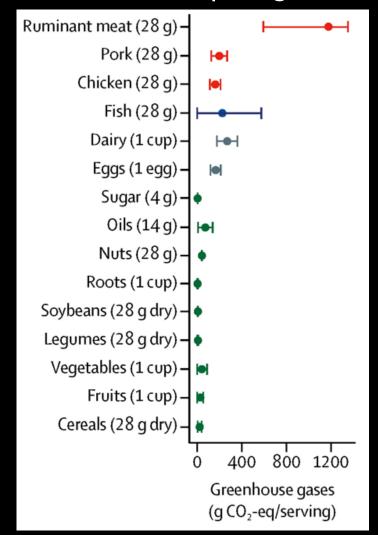
Performance

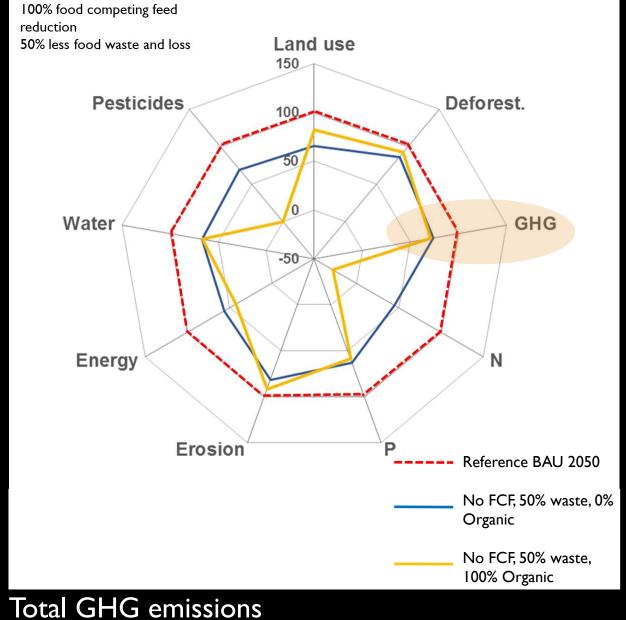
Various ecosystem services: trade-offs and synergies



Performance

GHG emissions per kg





VS.

Recap

- Scale
- Scope
- Functions
- Performance

Suggestions for sessions

Scale

• Aspects of scope and providing different functions and services: trade-offs and synergies

Metrics for circular food systems