

Combining Environmental Life Cycle Assessment and Land Use Modelling



TUKFS Conference – York – 6-7 Jan 2025

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The Global concern of Sustainability

THE  TIMES

Sustainability rules will be a headache for British business

Companies will have to report on their environmental and social impact, but many are unprepared for the red tape that replaces less-than-rigorous greenwashing

The business value of social sustainability

BrandPost • By NTT
07 Mar 2024 • 3 mins

VOGUE
BUSINESS

Did fashion deliver on its sustainability promises in 2024?

Elections! Bankruptcies! Scandals! It's been an eventful year for sustainable fashion.

 AGRICULTURE **DIVE**

Farm conservation funding hit a record high in 2024. A majority of farmers still got nothing.

Close to two-thirds of applicants for the USDA's farm conservation program were rejected despite increased investment from the I



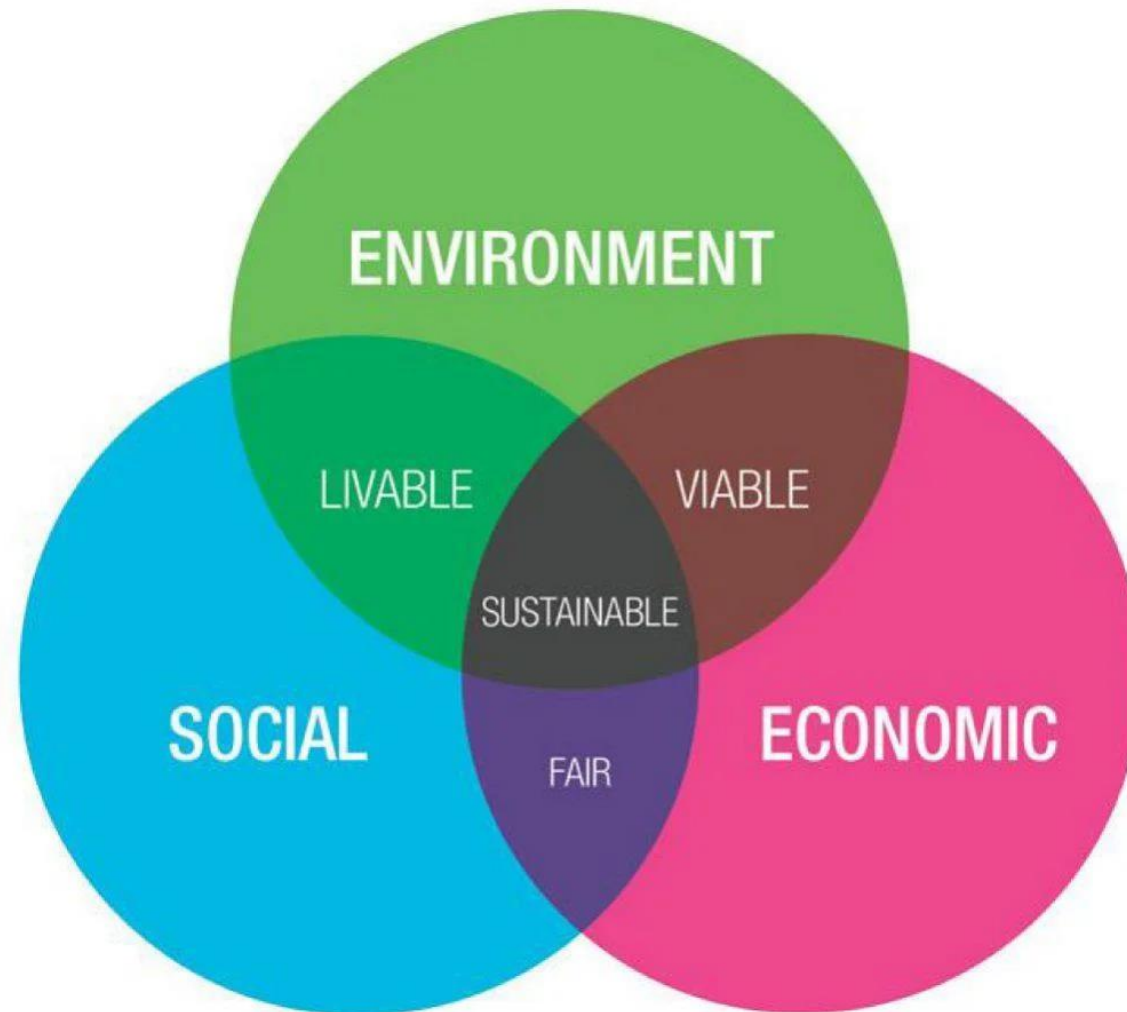
Can organic cotton help protect tigers?*

*In other words: How can small-scale farming in wildlife corridors benefit people and biodiversity?

Exploring sustainability across...



Sustainability in a (out of date) nutshell



FoodSEqual



FOOD SYSTEMS EQUALITY

Co-production of healthy, sustainable food systems for disadvantaged communities

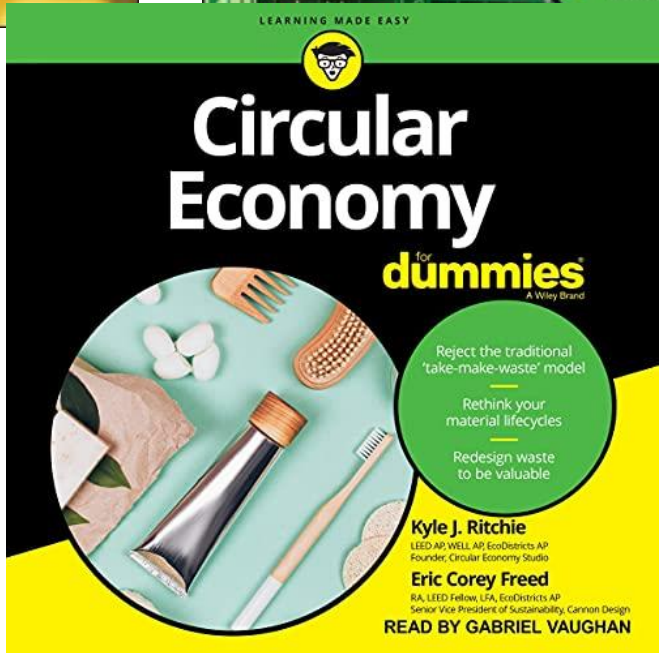
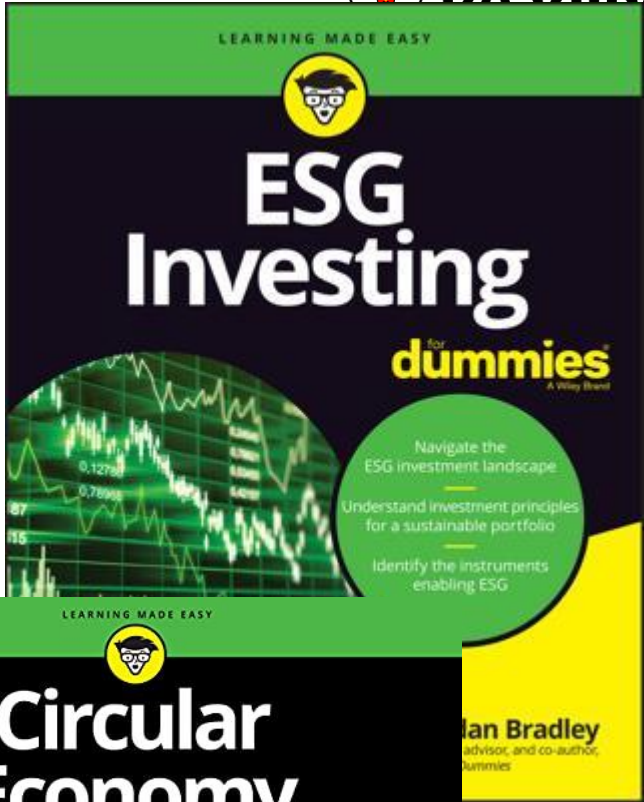
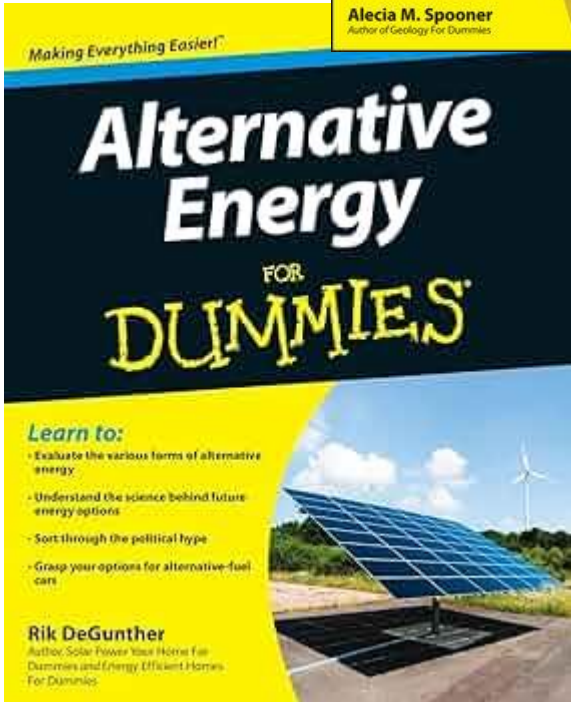
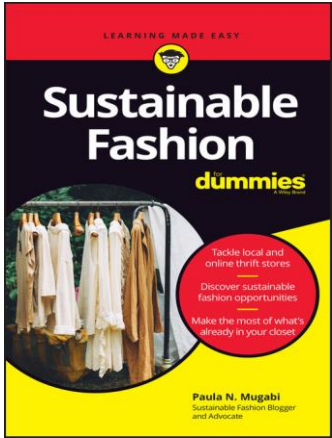
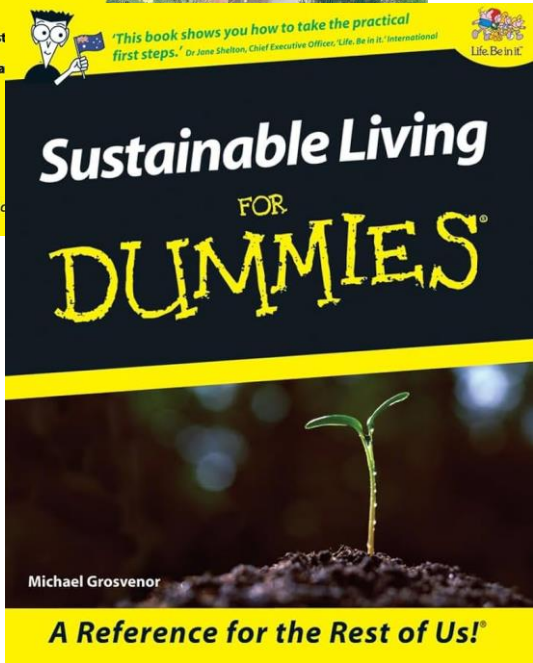
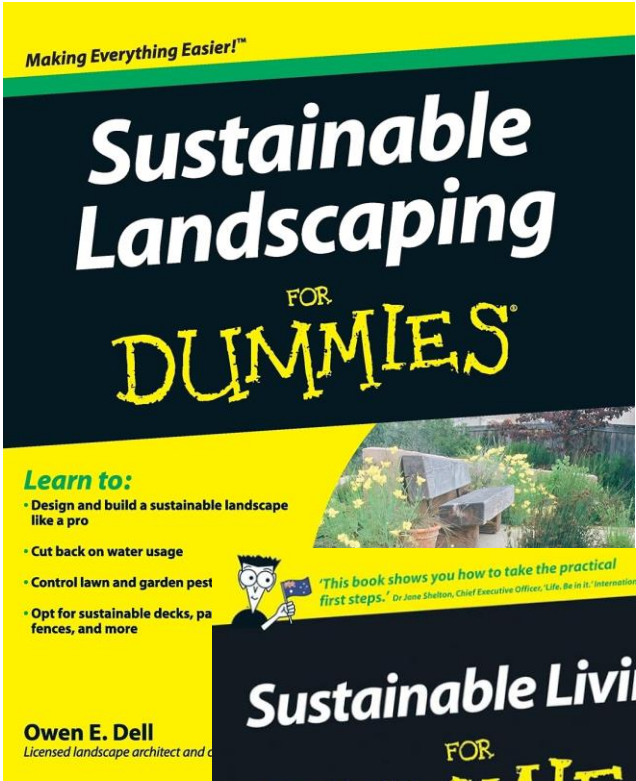
"Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs."



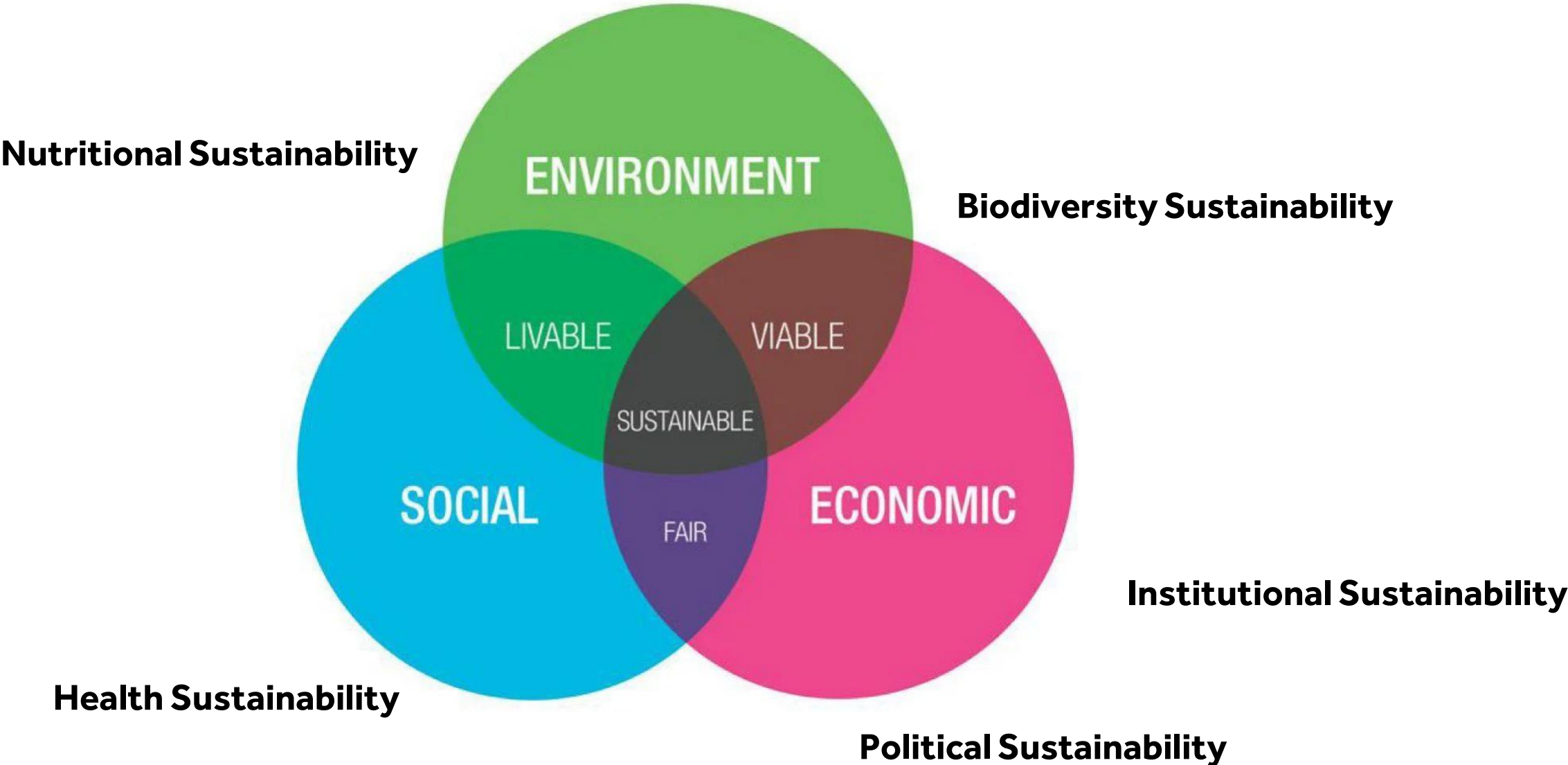
Gro Harlem Brundtland

The 29th Prime Minister of Norway, Former Director-General World Health Organization,
Founder The Brundtland Report on Sustainability

Sustainability: that simple?



Beyond the three-dimensional perception



Fresh vegetables sustainability



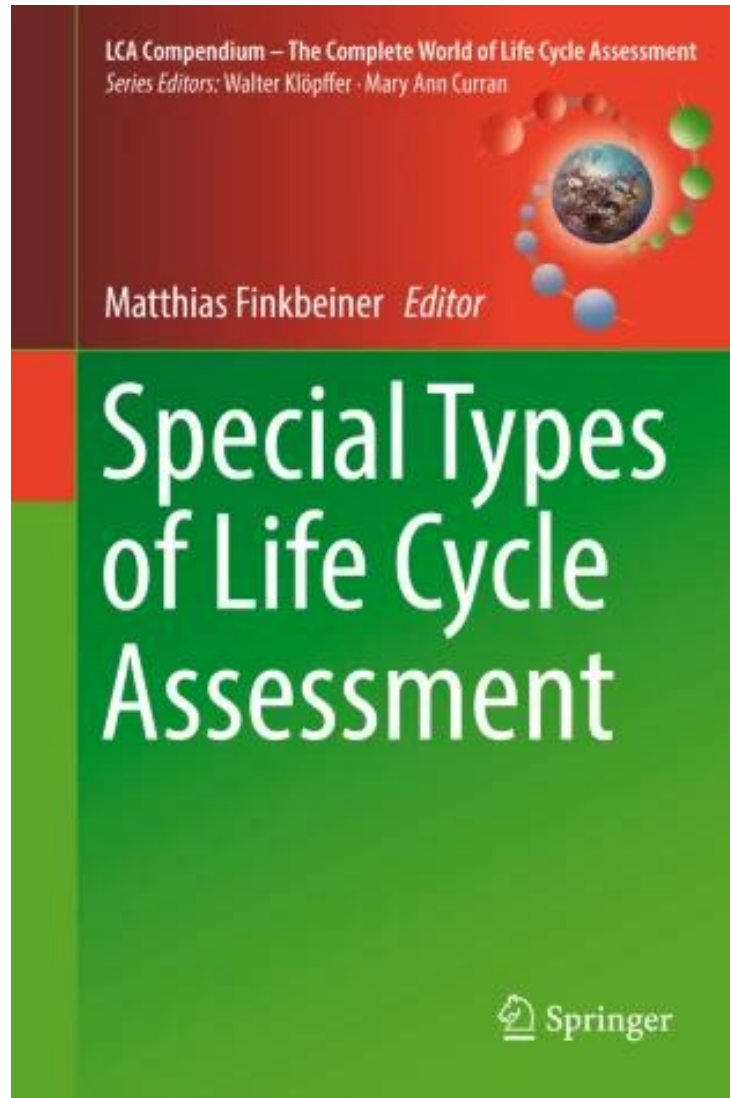


Choosing the right method

The Environmental Life Cycle Assessment



The necessity to combine impacts' assessments



Combining LCA-MFA models to identify China's plastic value chain environmental impact mitigation pathways

[Hongda Liang](#)¹, [Huijuan Dong](#)^{1,2,6,*}, [Chenyi Zhang](#)¹, [Yong Geng](#)^{1,2,3}, [Xiao Liu](#)⁴, [Gang Liu](#)⁵, [Chen Zhong](#)³




Integration of Life Cycle Assessment Into Decision-Analytic Approaches for Sustainable Technologies

Brian Dyson, Office of Research and Development, United States Environmental Protection Agency, Cincinnati, OH, United States

Combining Life Cycle Assessment and Manufacturing System Simulation: Evaluating Dynamic Impacts from Renewable Energy Supply on Product-Specific Environmental Footprints

[Jan-Markus Rödder](#) ✉, [Jan Beier](#), [Malte Schönemann](#), [Christine Schulze](#) ✉, [Sebastian Thiede](#) ✉,
[Niki Bey](#), [Christoph Herrmann](#) & [Michael Z. Hauschild](#)

Life Cycle Assessment and Life Cycle Costing for assessing maritime transport: a comprehensive literature review

[Giovanni Mondello](#) ✉ , [Roberta Salomone](#) , [Giuseppe Saija](#) , [Francesco Lanuzza](#)  & [Teresa Maria Gulotta](#) 

Combined nutritional and environmental life cycle assessment of fruits and vegetables

Katerina S. Stylianou, **Peter Fantke**, Olivier Jolliet

Agriculture based LCA

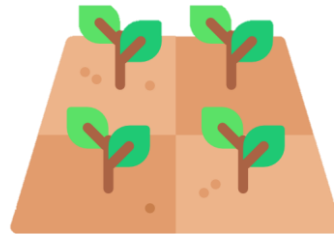


Focus at farm gate

Inputs



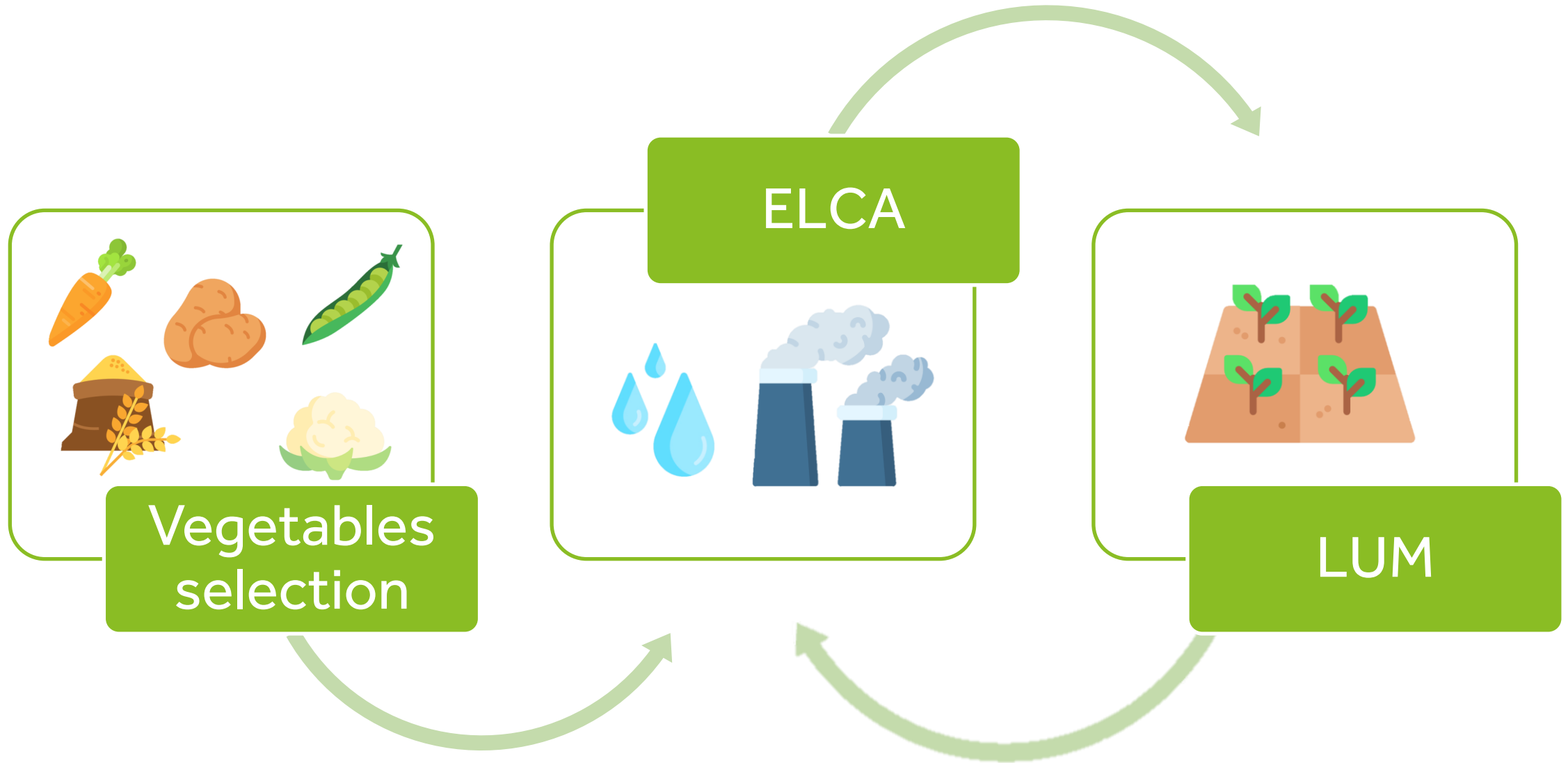
Land



Outputs



The model



Data :The Big Challenges



Consumption

- Family Food Dataset
- National Diet and Nutrition Survey

LCA specific

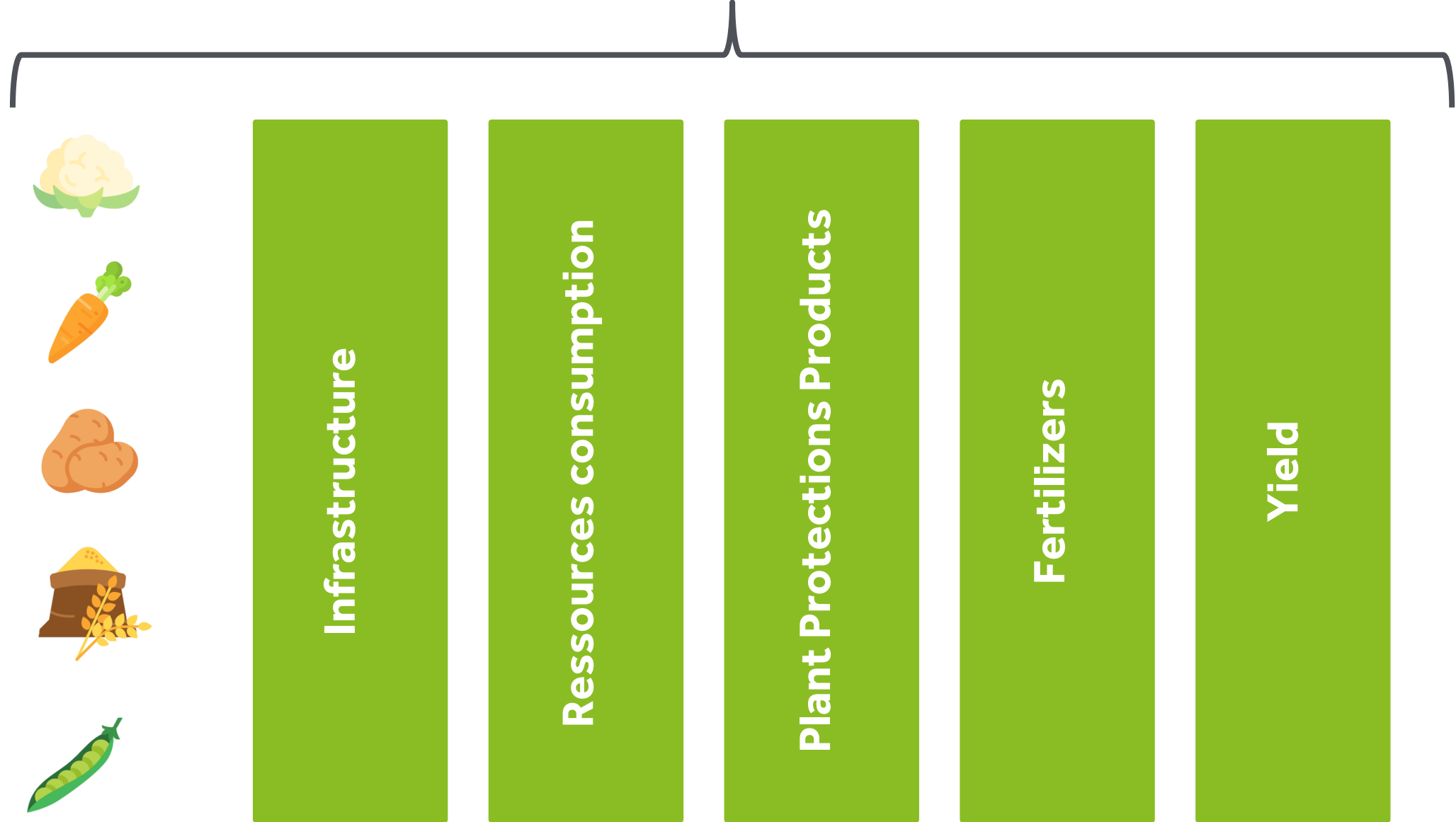
- EcolInvent
- World Food LCA
- Agribalyse

UK Agricultural Practices

- Defra – Horticulture
- The British Survey of Fertiliser Practice

Scenarios

Consistency



Practical implication



Sustainable Agriculture
Planning

Consider Economic and
Environmental Impacts for
Decision Making

Better optimization based
on scenarios and real case
studies

Other contributions

Theoretical

- Enhanced Systems Thinking
- Expanded Scope of Sustainability Metrics
- Improved Decision-Making Frameworks

Methodological

- Harmonization of data sources
- Advances interdisciplinary research methodologies.
- Complementary methods

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