EU food system assessment, metrics and visualization

And integrated approach

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METRICS, MODELS AND FORESIGHT FOR EUROPEAN SUSTAINABLE FOOD AND NUTRITION SECURITY - SUSFANS
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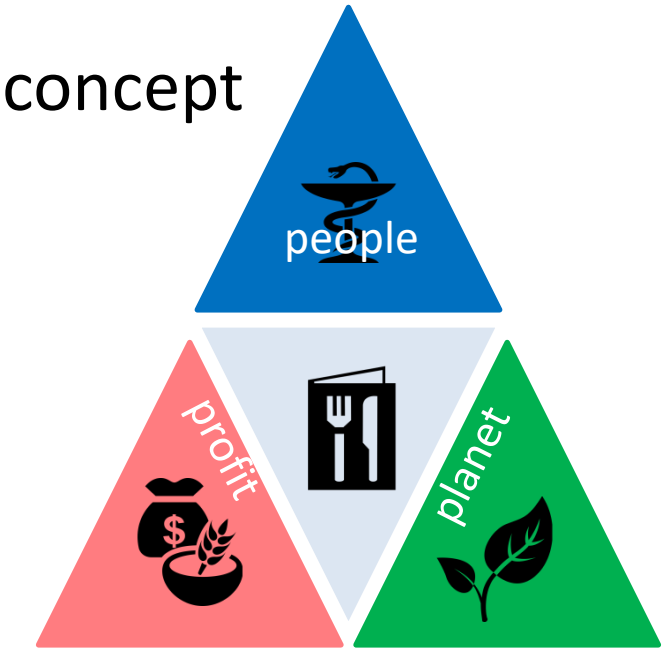
European *sustainable* food and nutrition security

Food and nutrition security in EU

World Food Summit, 1996

+

Sustainability concept



Rutten et al. (2018); Zurek et al. (2017, 2018)

An approach for enabling a new debate on and monitoring food system change – WP1

1. The creation of a **participatory environment**;
2. The development of a **conceptual framework** mapping out the driving forces, actors, outcomes and goals for the EU food system (Zurek et al. 2016);
3. An approach to devising a set of **performance metrics** for assessing the food system's status and **innovation options** across four key policy goals formulated by food system actors (Zurek et al. 2017);
4. A **modelling strategy** for quantifying the sustainability status of FNS in the EU/performance metrics (Kuiper et al. 2017);
5. A **visualization tool** that allows food system actors to assess the outcomes and associated trade-offs of possible innovation options in an integrated manner across the policy goals (the SFNS visualizer) (Zurek et al. 2018).

sustainability

MDPI

Article

Assessing Sustainable Food and Nutrition Security of the EU Food System—An Integrated Approach

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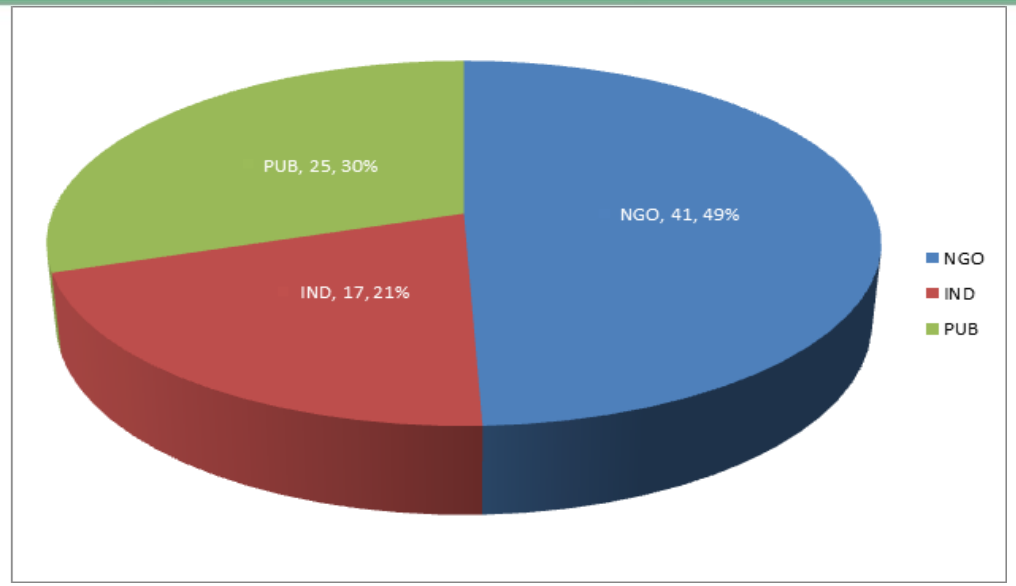
1. The participatory environment: Stakeholder core group (SCG)



35 members in the Stakeholder Core Group from the public sector, food industry and NGOs

4 meetings: 1) conceptual framework, driving forces, approach to metrics
2) performance metrics, scenarios for the EU food system
3) innovations in the livestock and fish sector
4) consumer research and innovations in the fruit and vegetable sector, overall findings and messages emerging from the project and how to relay them

Feedback/questions in-between meetings

SUSFANS Conceptual Framework for Assessing EU Sustainable FNS

SUSFANS
Food systems for health - environment - enterprise

INDIRECT Drivers of the Food System, e.g.

- Economic development
- Populations dynamics
- Technological change
- Agriculture and trade policies
- Environmental issues
- Culture and lifestyles

Status of EU FNS and sustainability performance of the EU Food System

- Food and nutrition security
- Farm, fishery, food business performance
- Environmental impacts
- Interactions with global food security
- Sociocultural wellbeing

EU policy goals

- Balanced and sufficient diets for EU citizens
- Reduced environmental impact
- Competitive EU agrifood business
- Equitable conditions and outcomes

EU & national policy makers

NGOs and other Food System influencers

EU food system

DIRECT Drivers of Food System Actors

Consumers, e.g.

- Knowledge
- Food choice motives (e.g. price)
- Food involvement/interest
- Attitudes and subjective norms
- Demographics
- Information
- Food neo-phobia

Food Chain, e.g.

- Food prices
- Regulatory environment

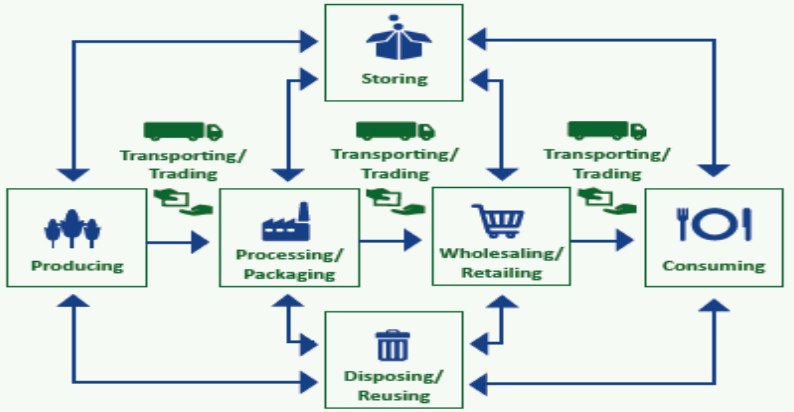
Producers, e.g.

- Regulatory environment
- Input and farm gate prices
- Contract opportunities
- Natural resource availability
- Available technology
- Producer and farm characteristics

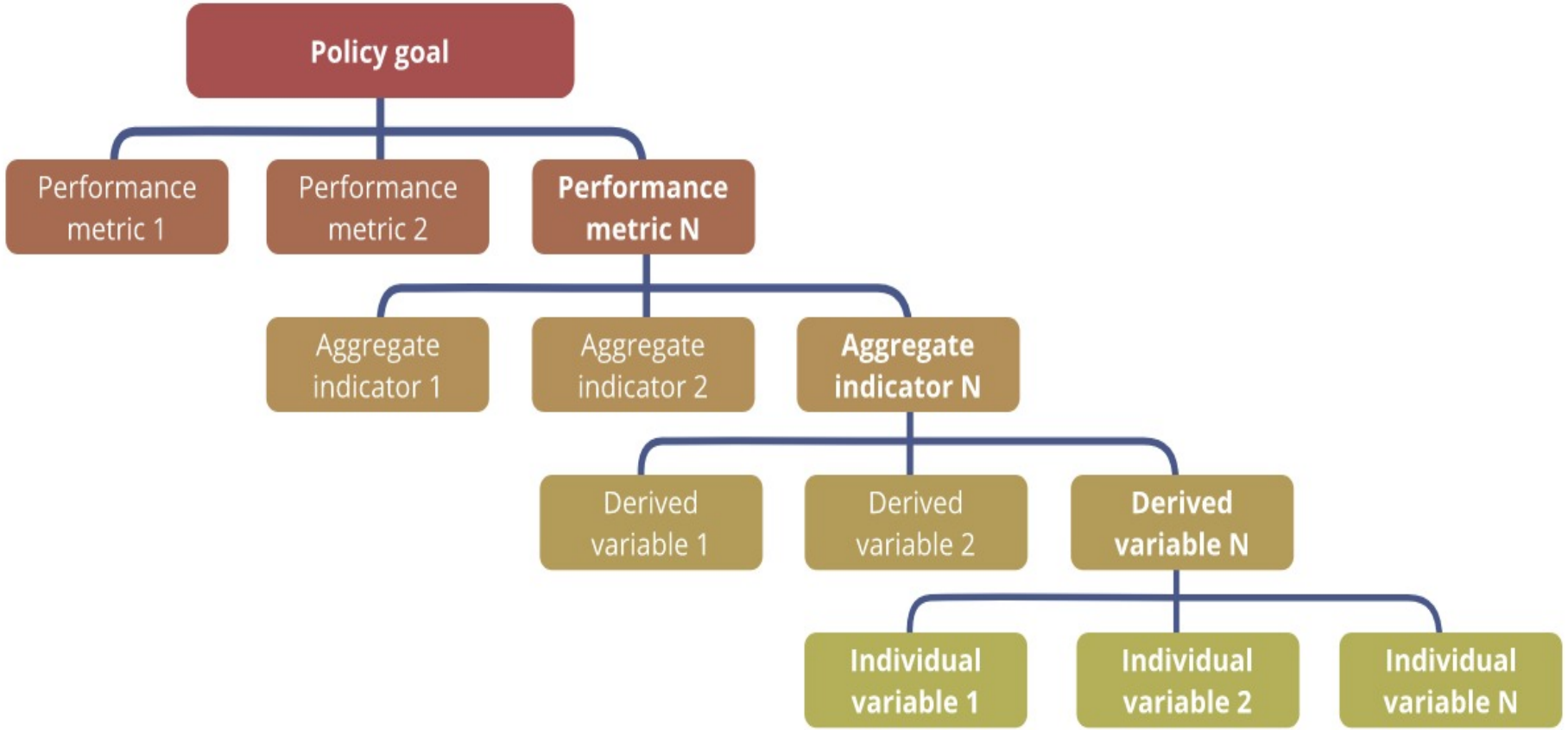
Food Systems outcomes

- Diets and consumption patterns
- Productivity, profit and competitiveness
- Environmental conditions
- Fair and just social conditions for food system actors

Food System activities



Metrics hierarchy for assessing sustainability performance of food system across societal goals and outcomes



SUSFANS performance metrics for EU food systems

Note: hypothetical assessment

Equitable outcomes & conditions

Balanced & sufficient diets

Reduced environmental impacts

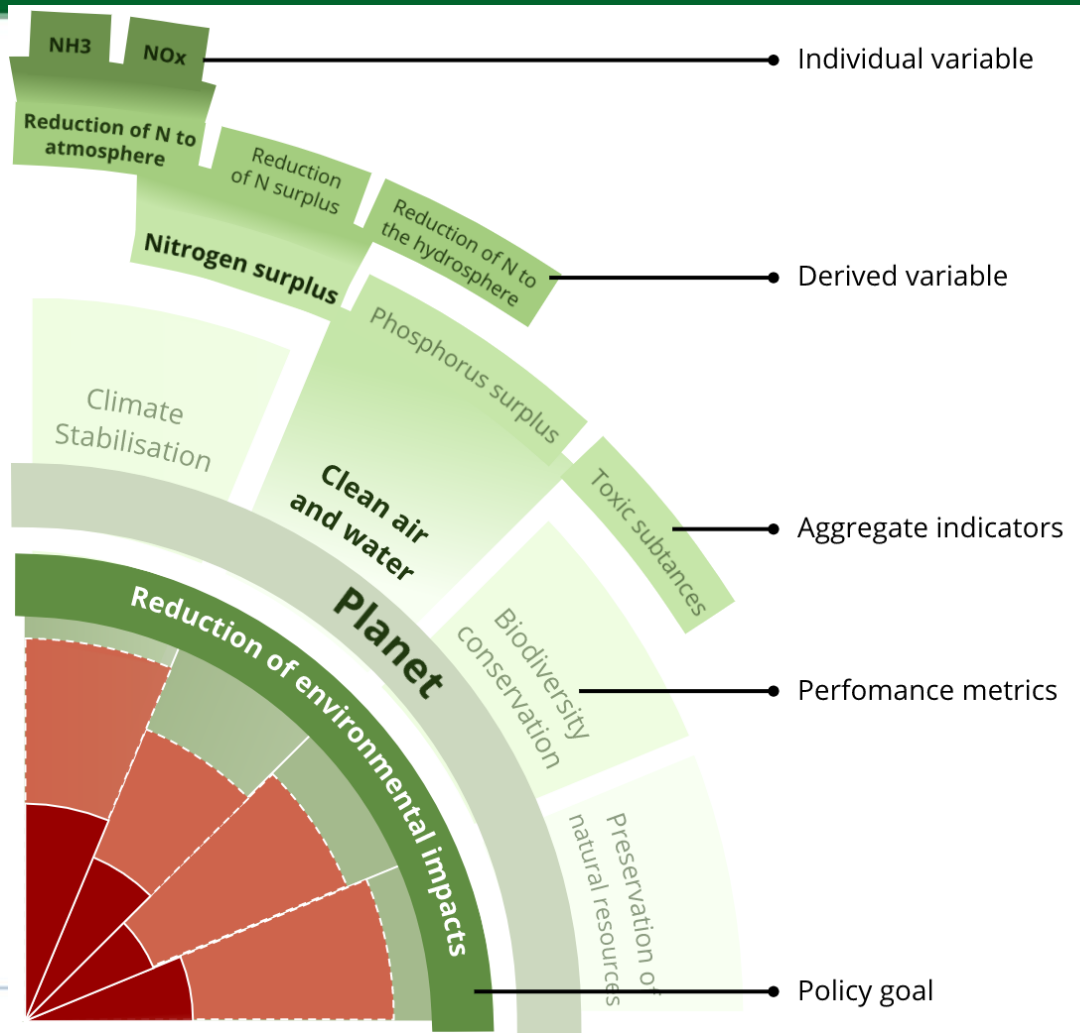
Competitive agri-food business

Zurek et al. (work in progress).

3. Assessing the food system: Metrics for goals and sub-goals of EU sustainable FNS

Hierarchical approach to building performance metrics out of individual indicators, depicted in the SUSFANS SFNS-impact visualizer

Zurek et al. (2018)

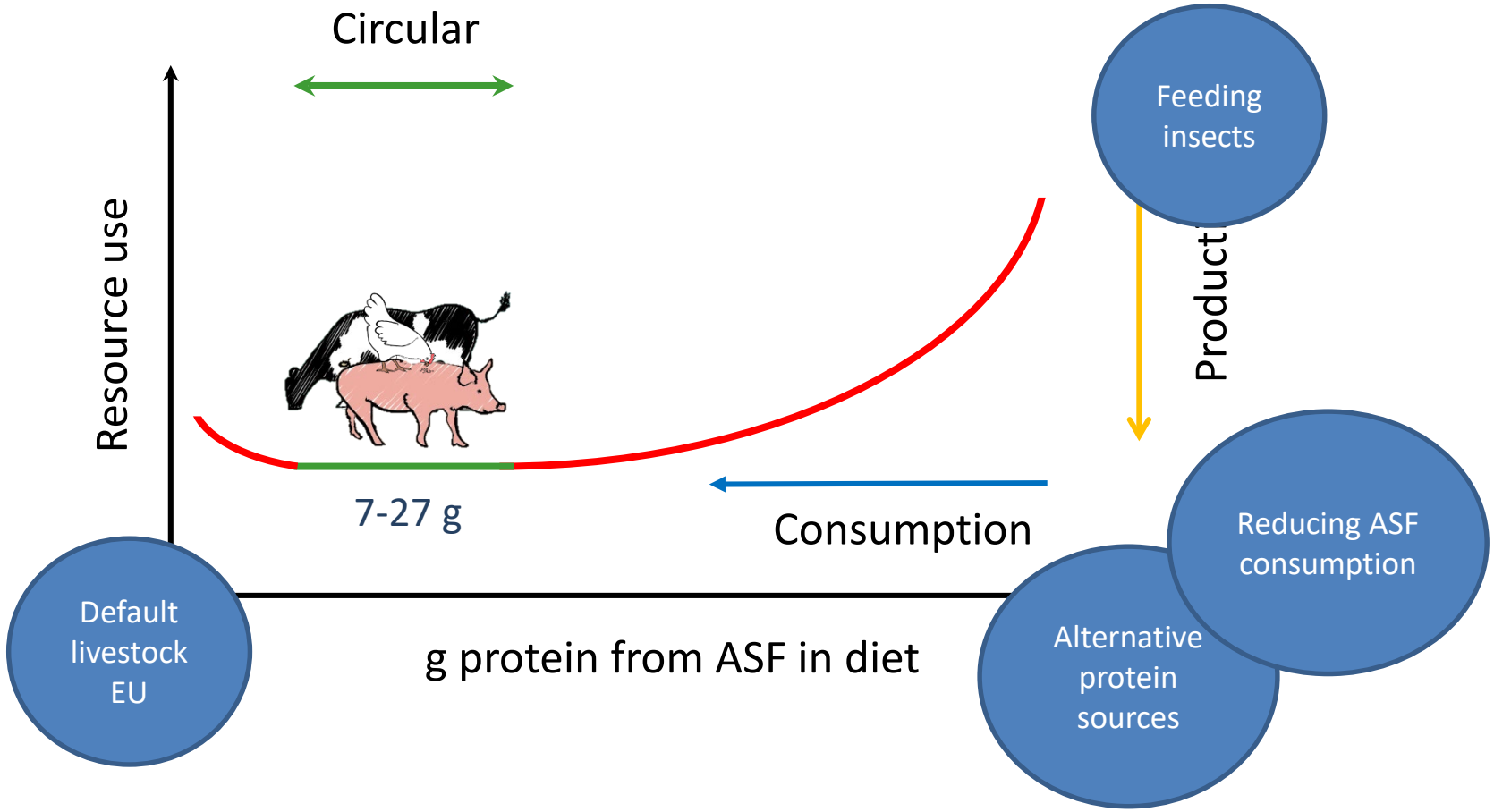


Policy goal	Specific goal = performance metrics	Explanation (draft version, will be updated)
Balanced and sufficient diets for EU citizens	Energy balance	Indicator: % of the population that is overweight and obese
	Adequate Nutrient intake	Indicator: Nutrient based summary score
	Adequate Food intake	Indicator: Food based summary score
	Reduced prevalence of diet-related NCDs	Indicator: to be developed
Equitable outcomes and conditions	Equity in food consumption	Concerning malnutrition in all its forms. Indicators: availability and accessibility of food and the stability of this.
	Equity in access to food	Concerning ethical issues (animal welfare, technology acceptance, global food security) and social justice (e.g consumer & citizen empowerment; gender/age/race differentials)
	Equity among producers and chain actors	Access to resources, finance & technology, position of primary producers in the value chain
	Footprint of food	Resources embedded in and emissions related to food consumption and production, representing equity across the generations
Reduction of environmental impacts	Climate stabilisation	GHG emission reductions, contribution to stable earth and maritime systems
	Clean air and water	Nitrogen and phosphorus surplus, toxic substances
	Biodiversity conservation	Agricultural land use diversity, reductions of the contribution of the agrifood chain to loss of mean species abundance (MSA)
	Preservation of natural resources	Sustainable water use, exploitation of wild-caught seafood resources, and maintenance of soil fertility
Competitiveness of the EU agri-food business	Value added	Food sector growth; in relation to world food sector
	Productivity & innovation	Total and labour factor productivity growth in food sector; relative to economy
	Job creation	Job & wage growth in the food sector; relative to economy
	True-price structure	True-price of food; Social (GHG) costs included in the market prices

4. Models in the SUSFANS box

Macro-economy	*Diet & health*	*Agricultural production*
	SHARP Product detail Specific diet needs Short run EU4	**GLOBIOM** Spatial detail Environmental impacts Long run Global, grid
MAGNET Complete economy Income effects Long run Global, countries	**DIET** Consumers preferences Health & environment Short run EU3	**CAPRI** EU detail Production detail Long run Global, EU, NUTS2

Example: Exploring innovations for livestock production



Slide: H. van Zanten, WUR

SUSFANS performance metrics for EU food systems

Note: hypothetical assessment

Equitable outcomes & conditions

Balanced & sufficient diets

https://anderson-rc.github.io/spidervis2/

Reduced environmental impacts

Competitive agri-food business

Zurek et al. (work in progress).