Sustainability in Food Networks

Conceptual framework

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19th Annual World Forum and Symposium
Budapest Hungary, June 20 - 23, 2009

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Overview

Overall challenge:

How to proceed towards
long-term sustainability of food networks
to serve environmental, socioeconomic
and consumer needs ?

1. Food system characteristics
2. Sustainability in the food system
3. Integrated concept for sustainability in food networks

Characteristics of the food system

- Food is basic human need, impact on health (obesity - malnutrition)
- Global & dynamic
  - Need of transport
  - Production basis often in developing countries
- Dependence on availability of arable land and sweet water
- Agriculture deeply routed in society and regions
- Impact on environment
- Changing supply (seasons, weather, climate changes)
- Changing demand (seasonal, diet patterns, lifestyle, alternative use options → biofuel)

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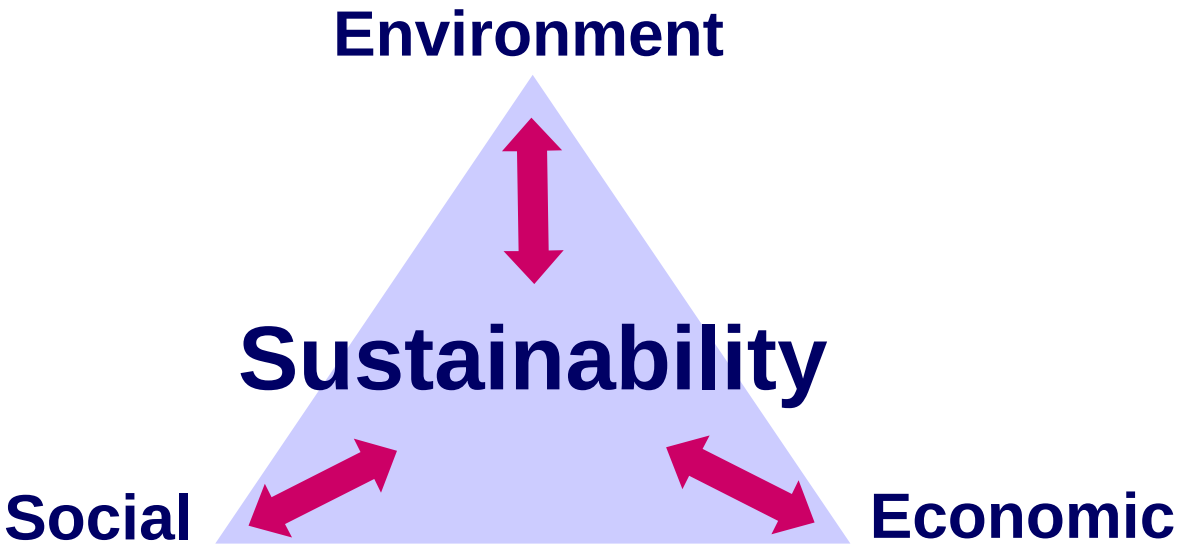
The challenge of sustainability

Sustainable development =
meeting needs of present generation
without compromising
the ability of future generations
to meet their needs



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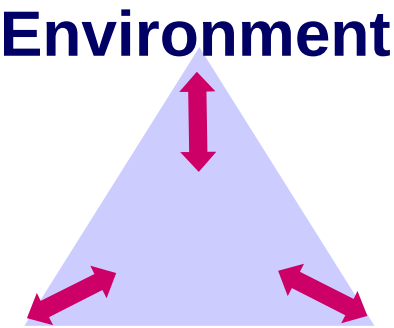
Food system and sustainability

•Consumption of energy and sweet water for production
•Waste (packaging and food waste)
•CO2 emissions from production and food transportation
•Wastewater
•Biodiversity
•Soil quality



•Nutrition & health
•Food safety
•Fair and ethical trade along (global) food networks
•Social & ethical conditions in companies
•Animal welfare

•Affordability for consumers
•Food chain performance & competitiveness
•Food quality

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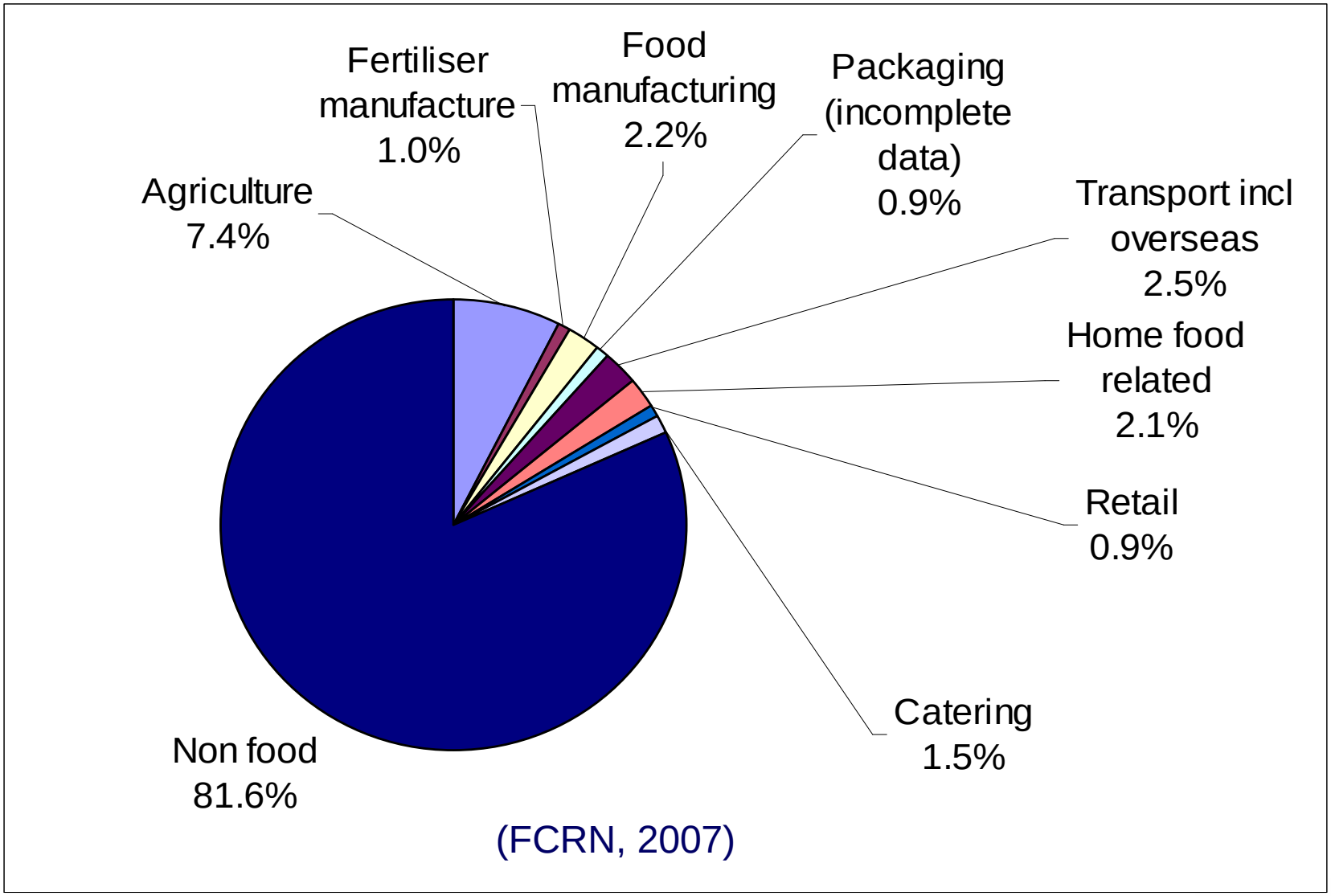
Food networks and sustainability?
GHG emissions



(FCRN, 2007)

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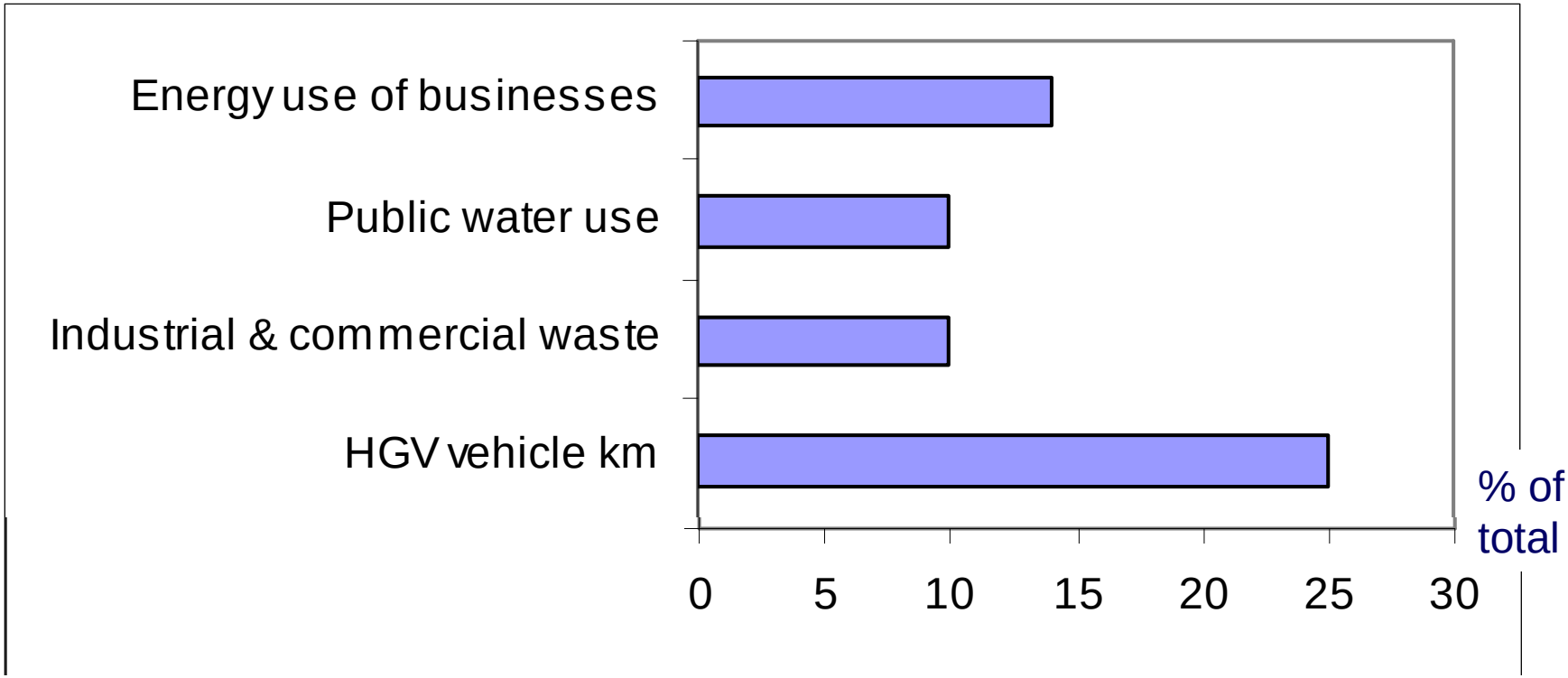
Some evidence for environmental relevance of food system: Facts from UK

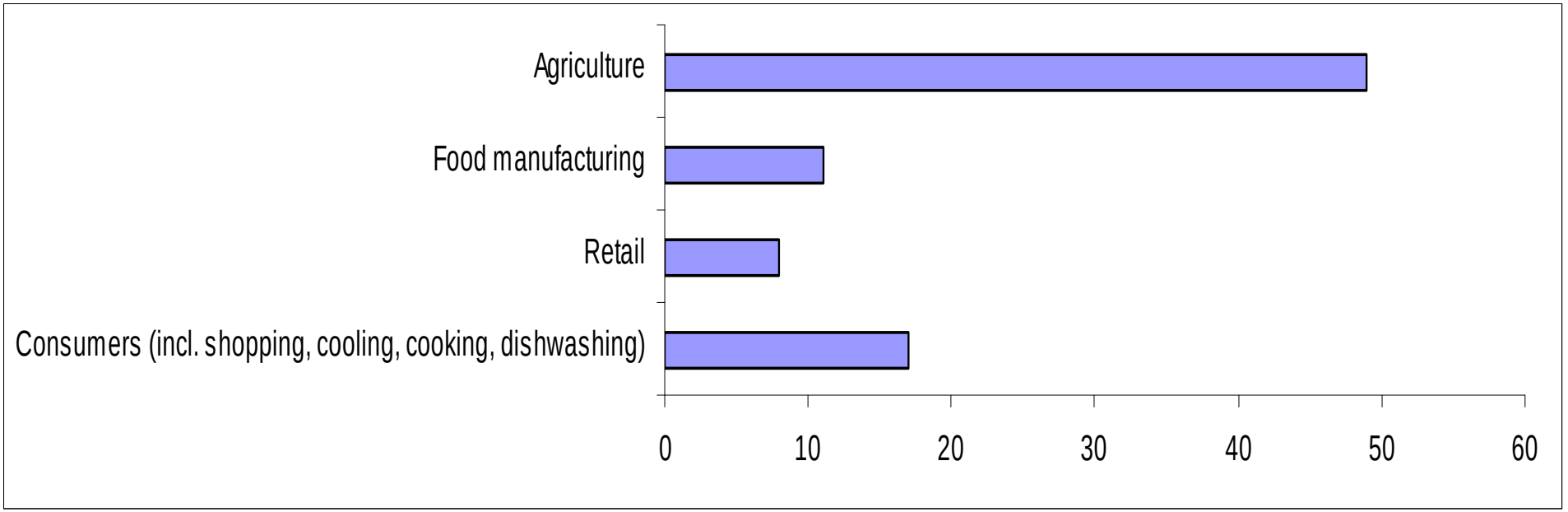


In addition:

- 12,7% of total workforce

Source: FISS

Food value chain accounts for 17% of total UK GHG emissions – % wrt the chain levels



In addition:

- 40% of food packaging not recyclable
- 20-30% of food discarded in households

Source: FISS

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Animal food (meat and dairy) account for 51.1% of all food sector emissions

Flying London to NY

same as:

400 round trips to your supermarket

➢**10 weeks meat consumption family** (2Kg beef/lamb + 3 Kg poultry + 1 Kg pork)

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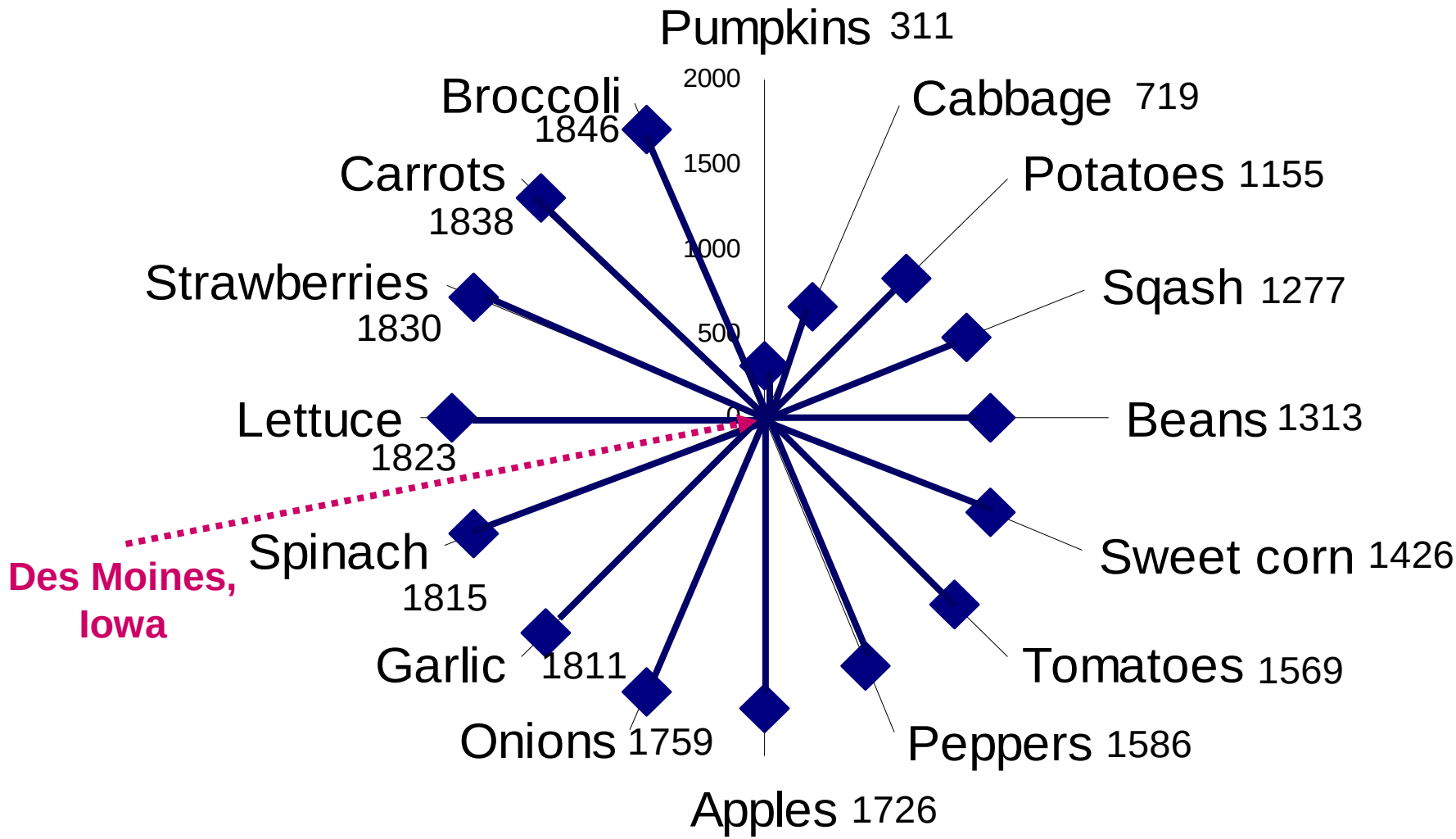
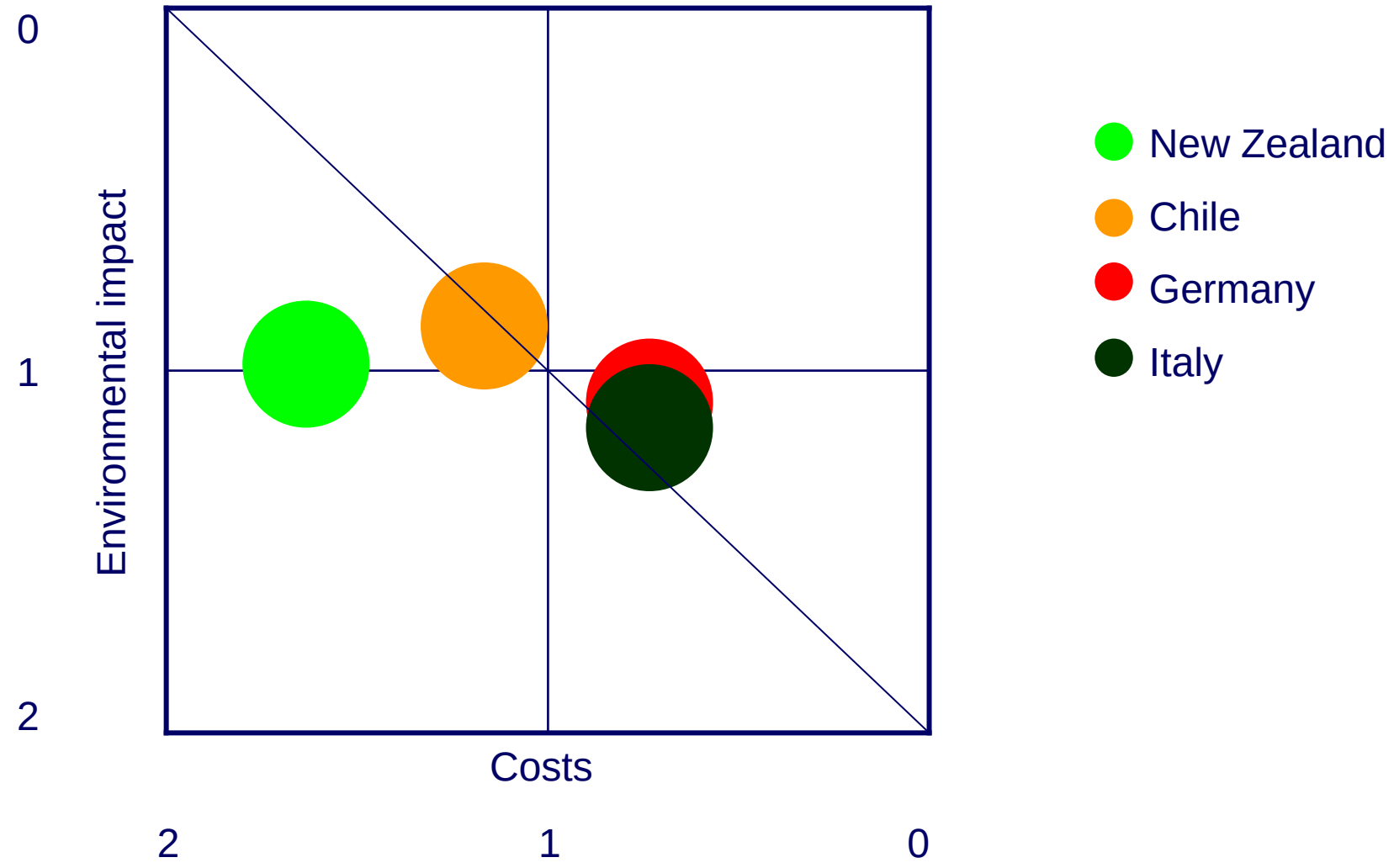
Food miles of US grown produce to Des Moines, Iowa



Source: FAO, Leopold Center for Sustainable Agriculture

Eco-efficiency of Braeburn apple in April



Source: BASF 2009

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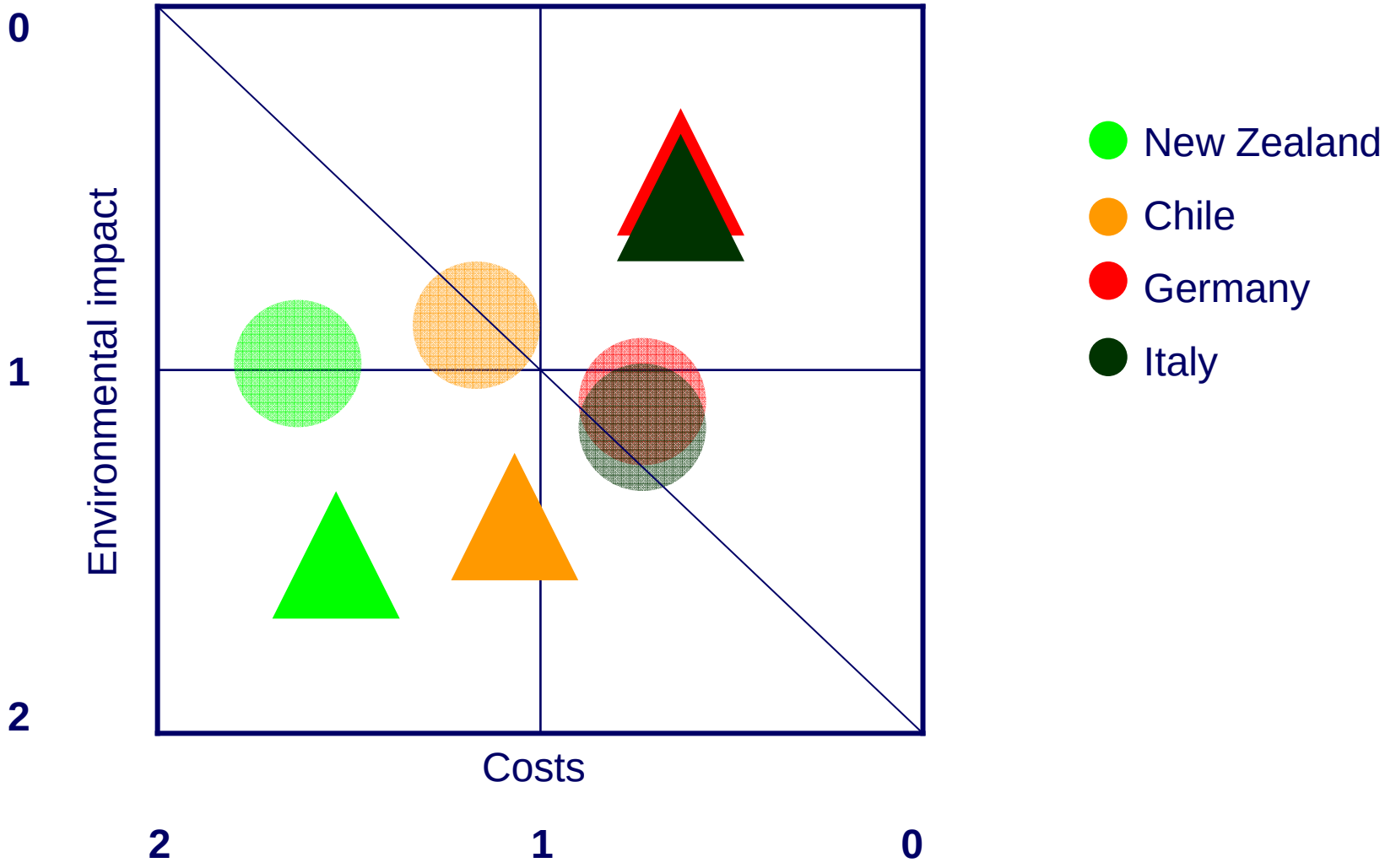
Eco-efficiency of Braeburn apple in November



Source: BASF 2009

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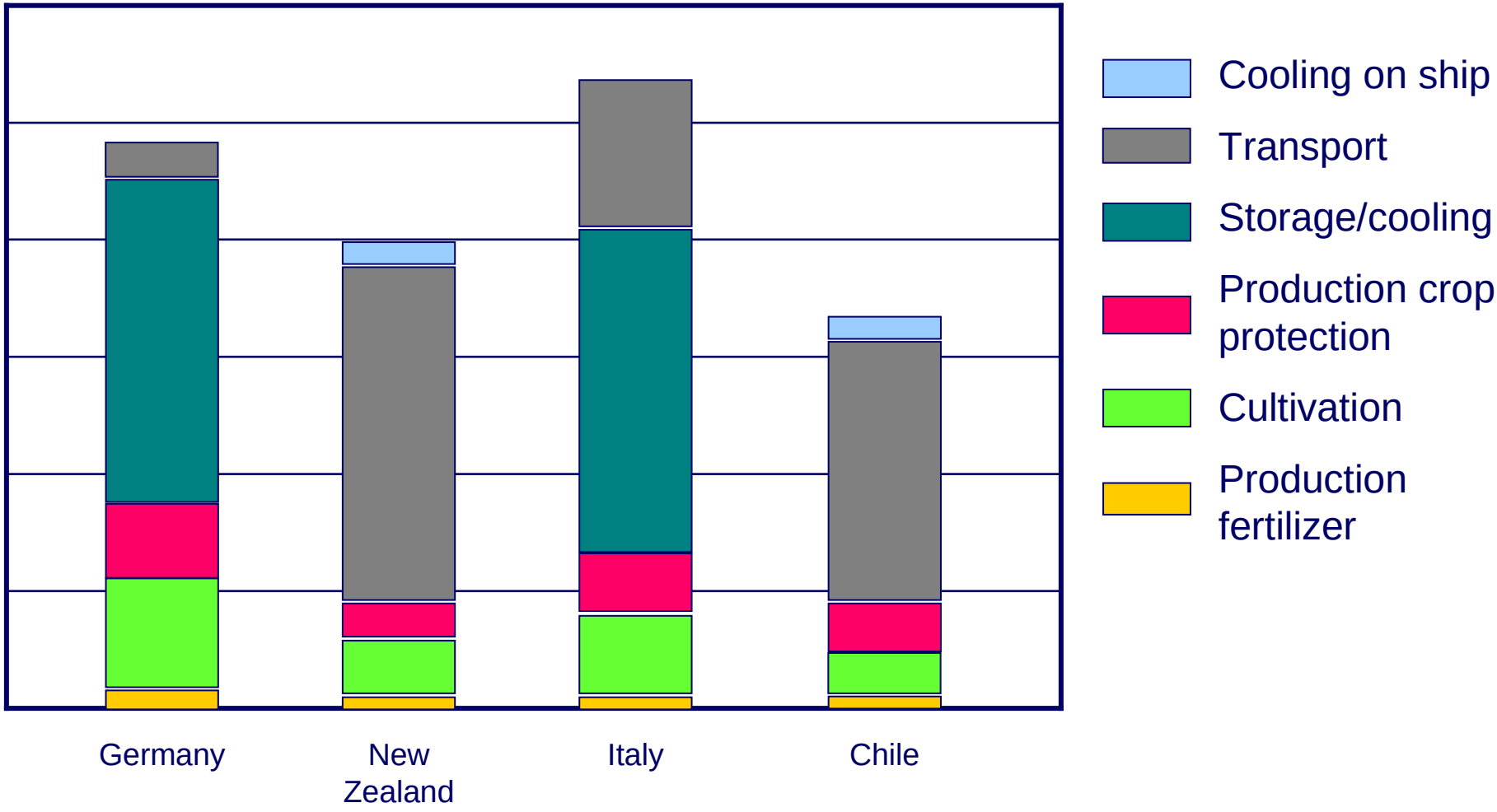
Energy consumption along apple‘s life cycle (April)



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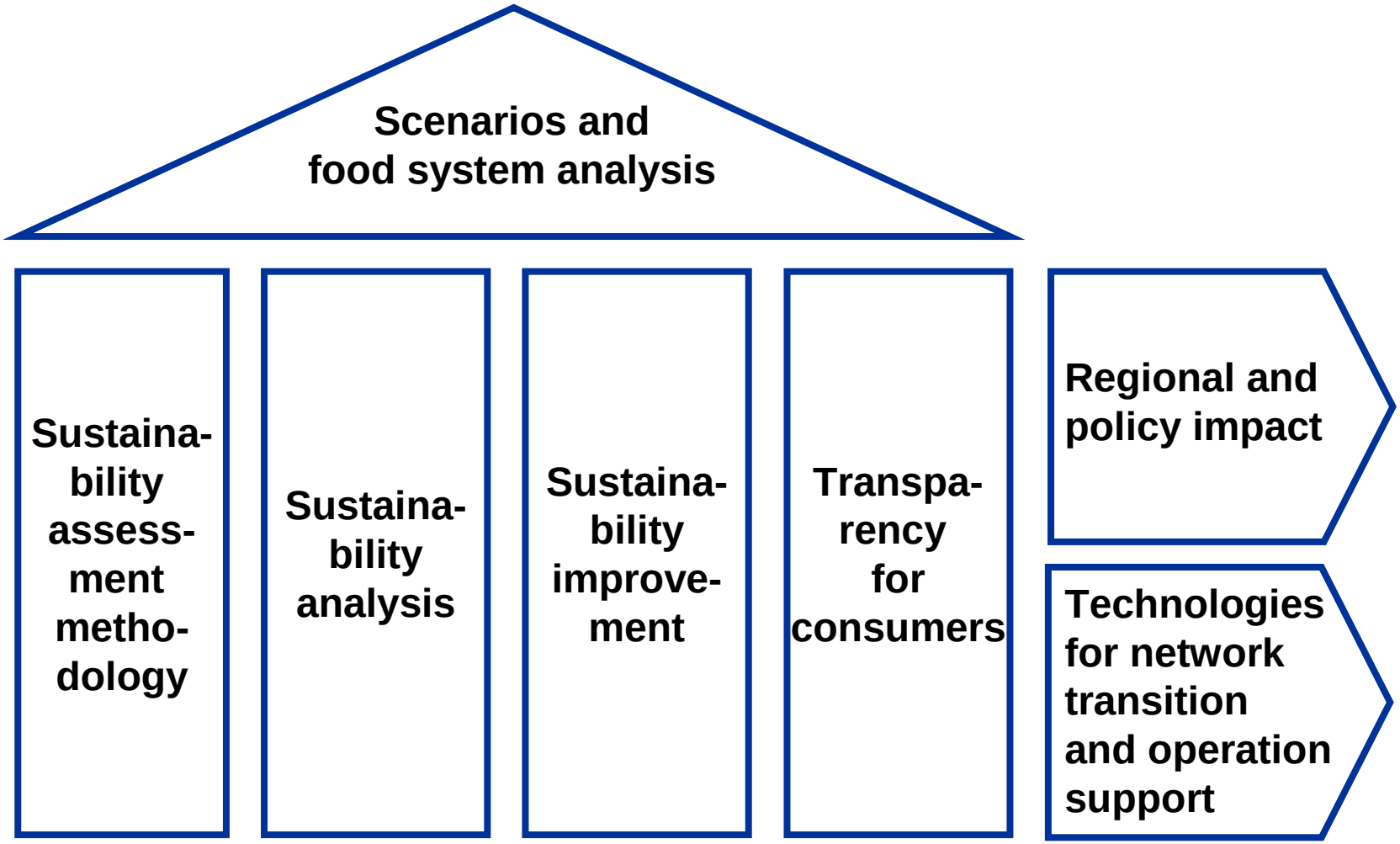
Elements of an integrated concept for sustainability in food networks



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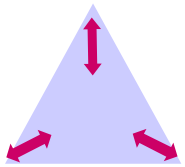
Sustainability assessment methodologies

- Classical: **Life-cycle assessment** – *environmental* impact of products throughout life-cycle
- Various other methodologies for either environmental, social or economic perspective
- Lacking:
  - Integration of social, economic & environmental perspective
  - Food chain focus



- **Objectives:**
  - Comprehensive set of environmental, social & economic indicators
  - Integrated methodology for assessment of sustainability of food chains from all sustainability pillars

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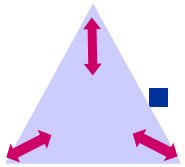
Sustainability analysis

- Only punctual or narrow evidence for environmental impact available
  - Focus on food chain stages, water and energy use & CO2 emission
  - Merely “food miles“ as basis for analysis
  - Some early carbon footprint analyses



- **Objective:** Analysis of various food networks from agriculture to private household for identification of sustainability “hot-spots” using integrated and multi-dimensional methodology
  - Focus on different kinds of food networks – global, regional, organic, standard – different product lines
  - Identification of “best-practice” references and priority areas for improvement

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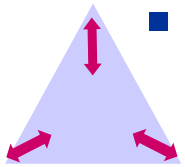
Sustainability improvement

- Only scattered knowledge and initiatives for sustainability improvement
  - Food processing (reduction of energy & water use)
  - Logistics and packaging
  - Fair trade

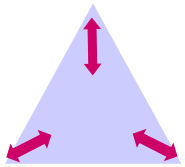


- **Challenge:** to develop strategies and solutions to increase sustainability at identified ‘hot-spots’ which
  - lead to balanced sustainability improvement of whole chain in all dimensions
  - are robust and resistant against global changes in the sense of “dynamic stability”
  - use best available technological, organizational, and managerial technologies and concepts.

Transparency for consumers

- Current situation:
  - Almost no knowledge on European consumers' attitudes, purchasing motives and responsiveness to sustainable food, including cultural differences across Europe
  - Consumers often miscomprehend sustainability attributes

- **Key challenges and objectives:**



  - Link value-providing triggers of consumer behaviour with communication of sustainability indicators across food chains for informed consumer decisions
  - Analyze effect of consumer behaviour on sustainability of food chains
  - Link results with sustainability indicators to (backwards) identify relevant information to be collected and communicated along food chains to serve consumers' transparency needs

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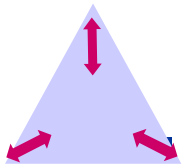
Scenarios and food system analysis

- **Objective:** identification of *"possible" futures* for the food system, including regional variations
  - Systematic exploration of inevitable changes (such as global climate change, decreasing availability of fossil fuels, changes in demographics, etc.)
  - Anticipation of breaks in the future & critical uncertainties

- Background for assessment of potential sustainability strategies for identification of robust and resilient sustainability strategies

Transition support towards sustainability

- **Key challenge:**
  - develop management technologies guiding the transition process balancing the environmental, social, and economic pillars of sustainability
  - combination of the enterprise focus with the perspective on enterprise relationships (contracts etc.)

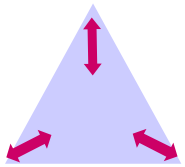


- **Objective:**
  - development of “Balanced Sustainability Scorecard” (BSSC) for use in the total food chain
  - Inclusion of environmental, social, and economic sustainability parameters for sustainability performance measurement

Regional and policy impact

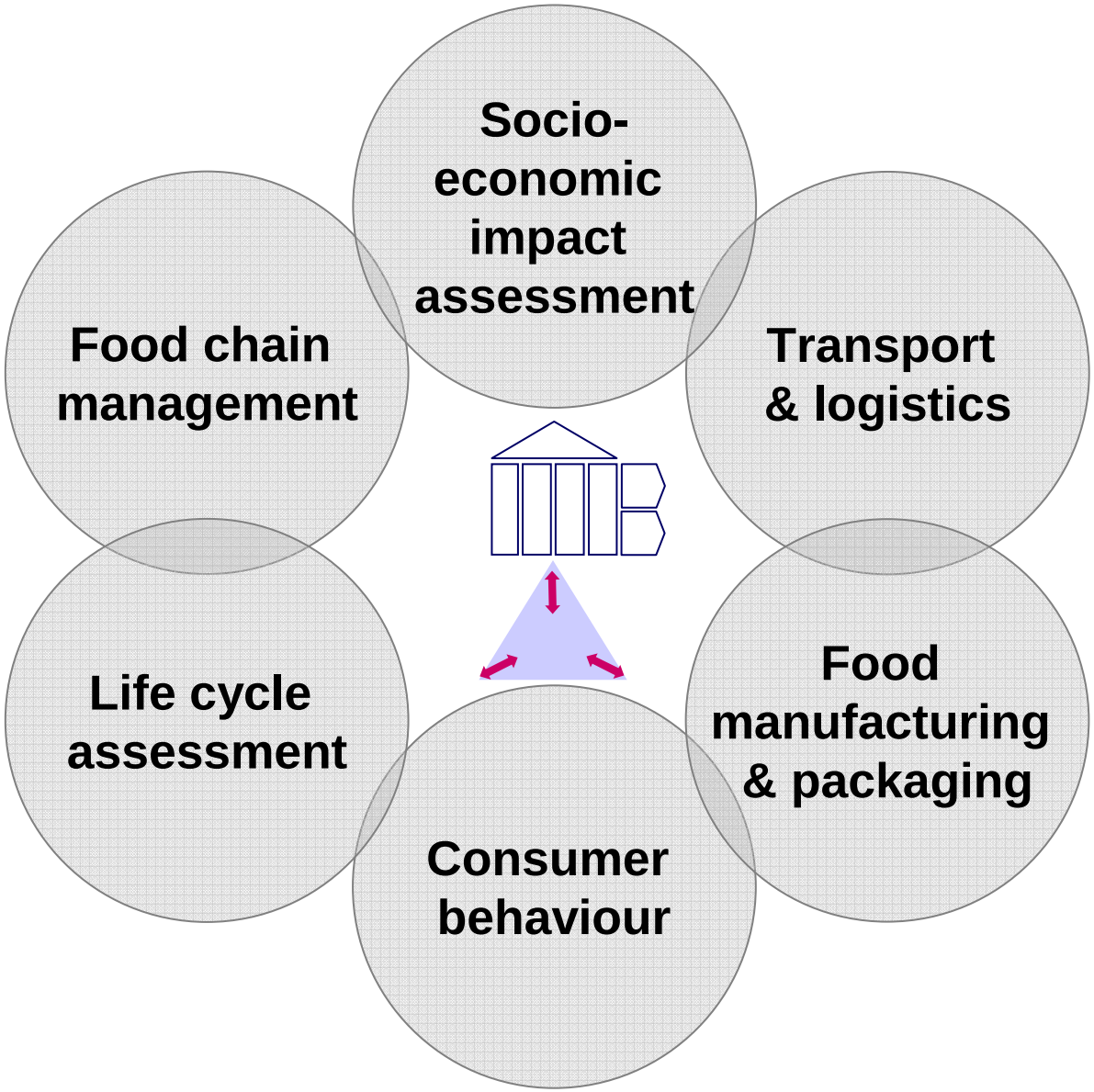
Objectives:

- Impact assessment of different food chain developments towards sustainability on sustainability status of **regions** considering different scenarios (sustainability adoption rates, changes in trade streams etc.)



- Impact assessment of alternative **policy** initiatives in various policy domains on sustainability developments in food networks

Areas of required knowledge and expertise for sustainability in food networks



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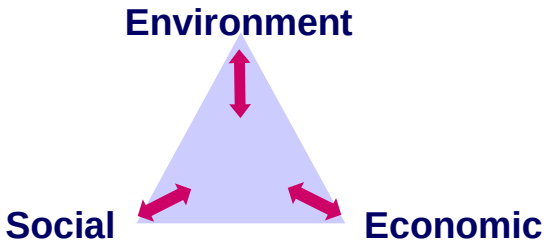
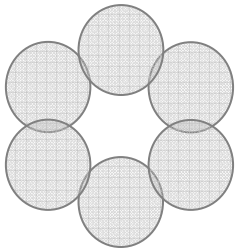


Scenarios and
food system analysis



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Transpa-
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for
consumers

Regional and
policy impact

Technologies
for network
transition
and operation
support

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