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Food System Concepts in a changing word

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Outline

I. The Food Chain and its multiple definitions...

II. Food System concepts

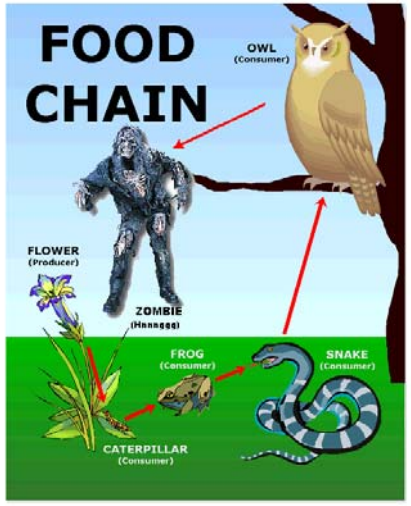
III. The food system outcomes and their determinants

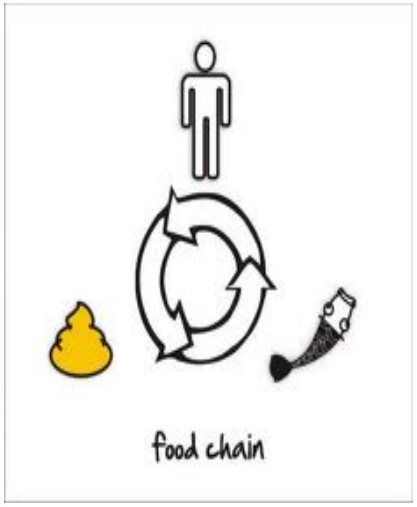
IV. Existing scenarios of European Food systems

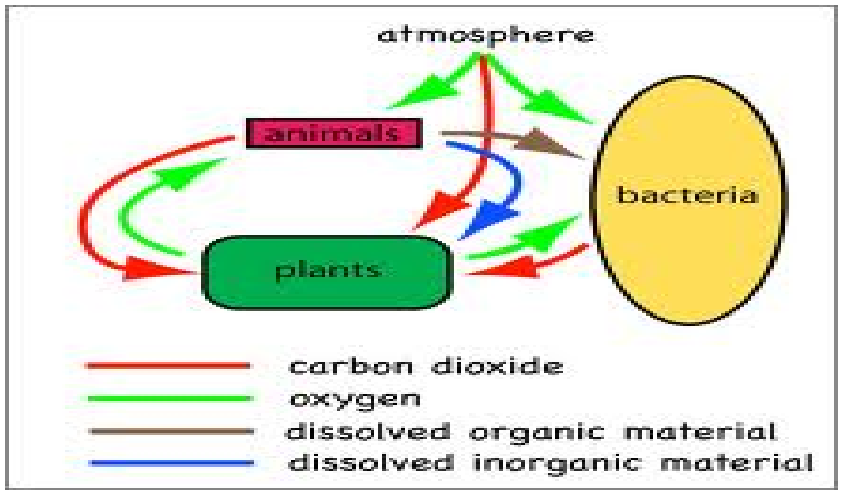
V. AKIS- Agricultural Knowledge and Innovation Systems

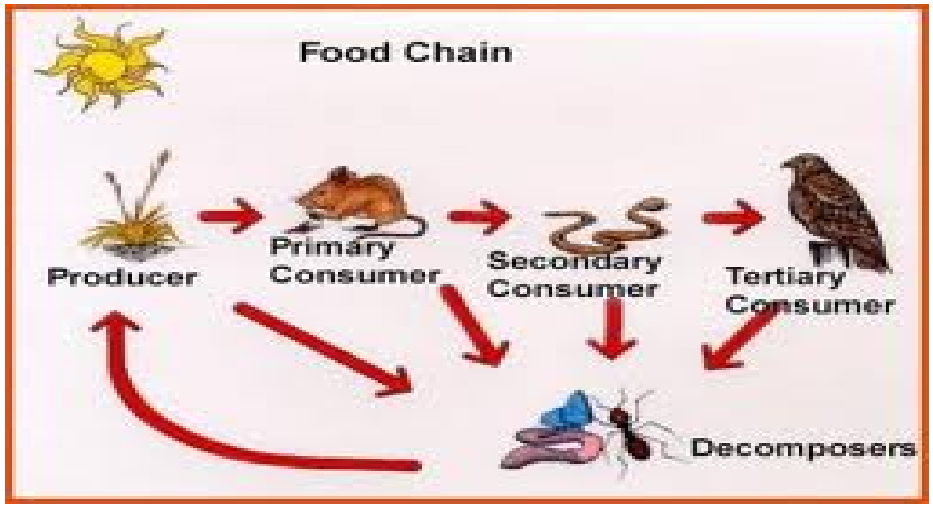
VI. Agriculture innovation in the food chain

The Food Chain is a Life Chain

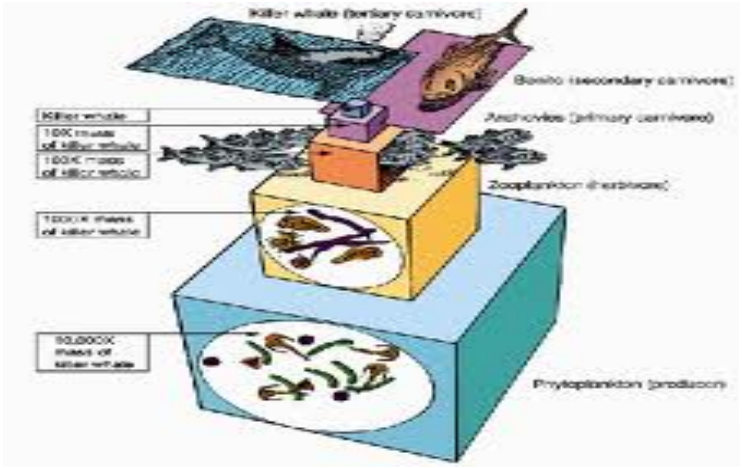


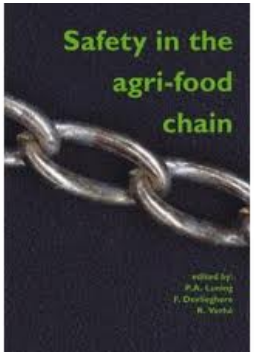






The Food Chain is related to food production and consumption





The Food Chain is a web which need appropriate management...

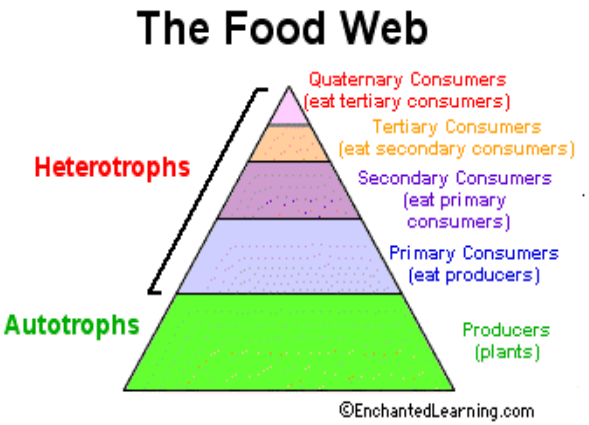
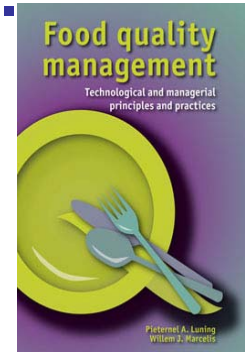
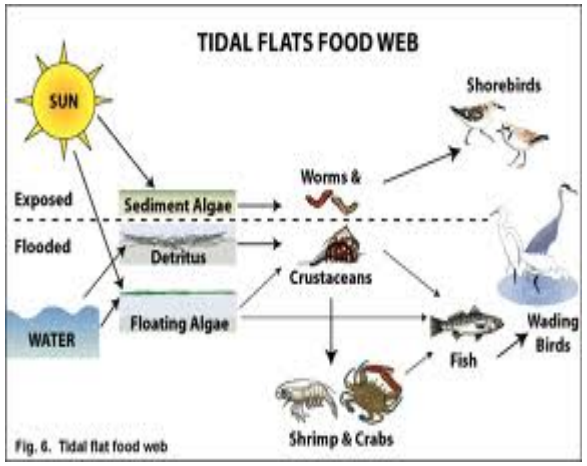


Figure 3 : Amélioration continue du système de management de la sécurité des aliments





The food system concept

Defined as an interaction of all CAP changes, as determined by international trade, and/or climate

➢identifies **interactions of stresses within the food system**: vulnerabilities within the food system, embodied water and carbon in food

➢allows analysis of **multiple food system outcomes: food security, ecosystem services, social welfare**

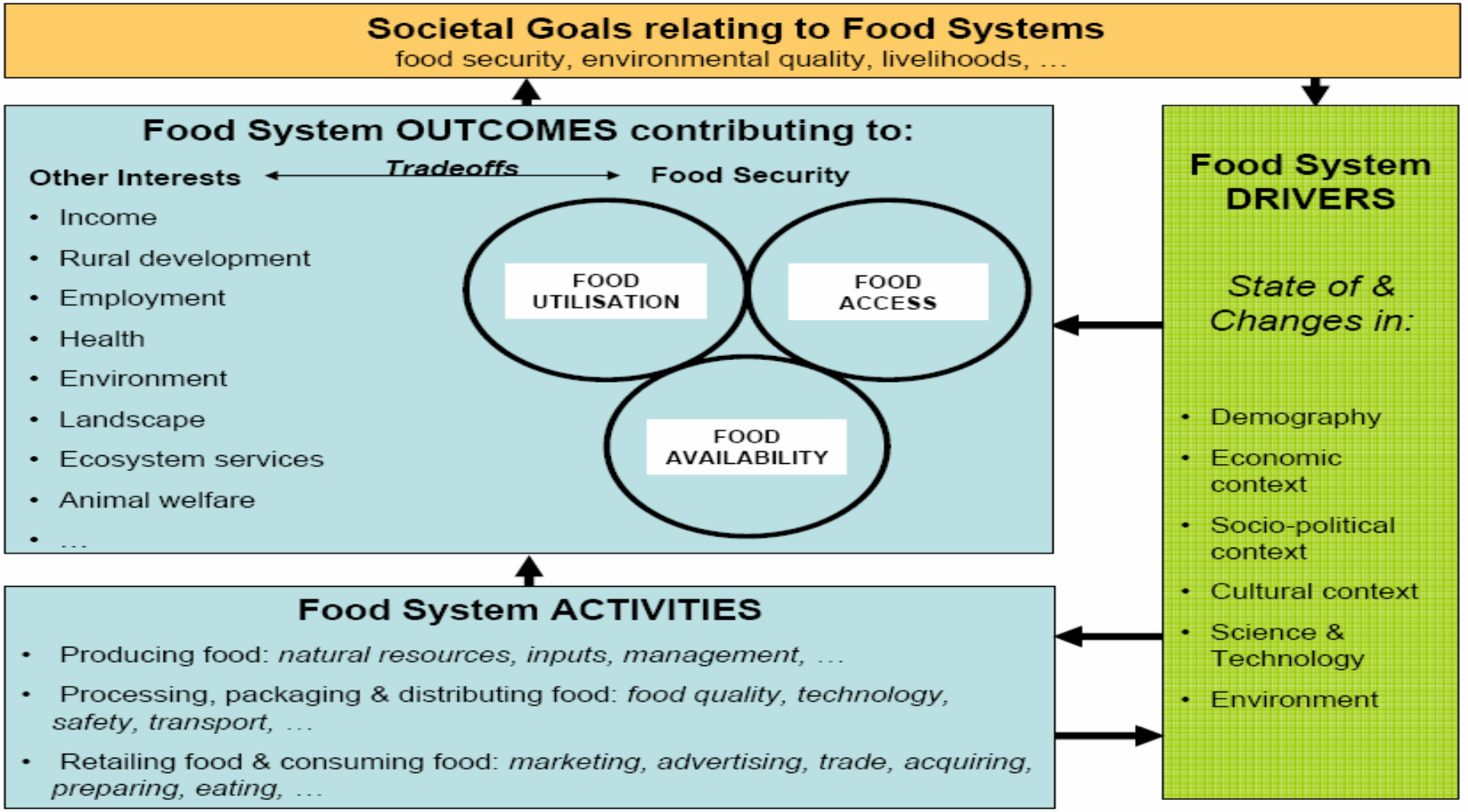
➢ **identifies possible intervention points** : improved nutrition, reduced GHG emissions, higher income from agriculture

➢**analyse trade-offs between outcomes of different management options for achieving desired outcome**

Food system = 4 sets of *activities:*
✓producing food
✓processing food
✓packaging and distributing food
✓retailing and consuming food

www.cost.esf.org

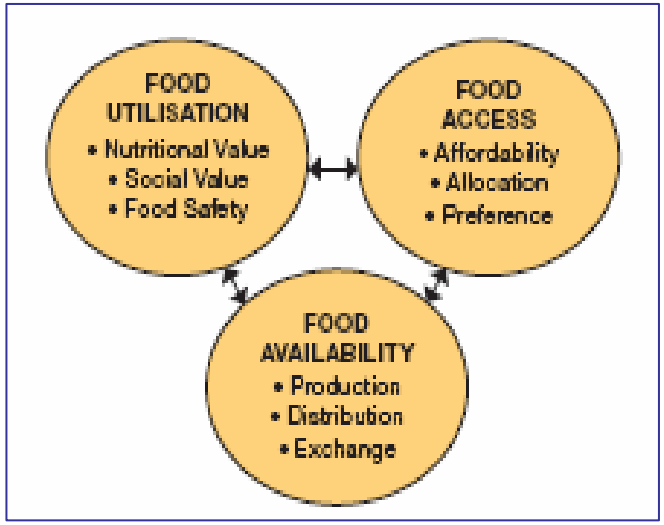
The key Food System drivers/activities/outcomes/feedbacks [1]



[1] Ericksen et al., 2005 and 2008

The food system outcomes and their determinants

FOOD UTILIZATION



Nutritional value = how is provided the daily requirements of calories, vitamins, protein, and micronutrients to people.
Determinants: diversity of food, type of primary protein (animal or vegetable), disease incidence, education, access to water, and hygiene practices.

Social value = social and cultural aspects of consumption, eating locally- or organically-produced food is highly valued.

Food safety = dangers introduced from the addition of chemicals during production, processing and packaging, and food-borne diseases.
Determinants: procedures, standards and regulations (or lack of) for food production, processing /packaging.

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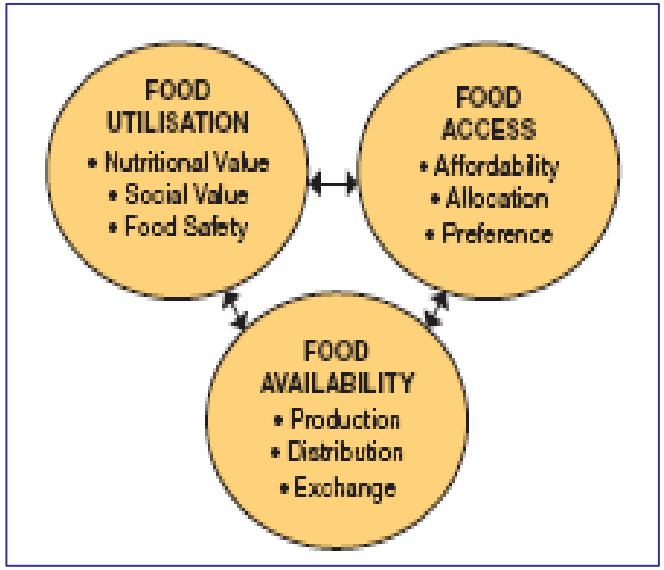
The food system outcomes and their determinants

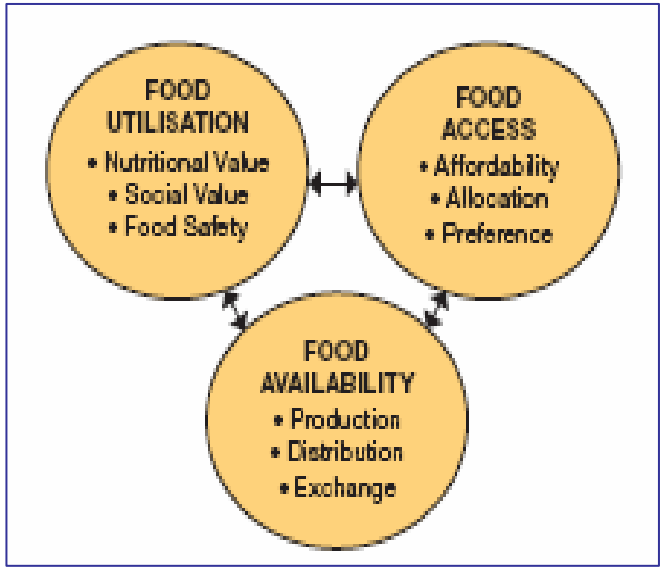
FOOD AVAILABILITY



- **Production** = how much and which types of food consumed are available through local production. *Determinants:* seed varieties, land sizes, irrigation, cropping cycle, labour availability, human capital, energy sources, input /output prices, technologies, local producers
- **Distribution** = how food for consumption is made available, in what form, when and to whom. *Determinants:* transportation and infrastructure, public safety, storage, availability of post-harvest processing, governance , security, and the enforcement of trade barriers
- **Exchange** = how much of the available food is obtained through exchange mechanisms such as barter, trade, purchase, or loans. *Determinants:* income levels and purchasing power, social arrangements , migration, gender and age structure, markets, terms of trade, currency, subsidies

The food system outcomes and their determinants

FOOD ACCESS



✓**Affordability** = the purchasing power relative to the price of food. *The determinants*: pricing policies, seasonal and geographical variations in price, local prices relative to external prices, income and wealth levels.

✓**Allocation** = when, where and how food can be accessed by consumers. *Determinants:* Markets, government policies designed to correct market failures, **social capital which** influences the supermarkets location.

✓**Preference** = social or cultural norms and values influence consumer demand for certain types of food. *Determinants:* religion, season, advertising, preparation requirements, human capital, tastes, customs and female labour force participation.

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Existing scenarios of European Food system *since 1992 – more than 8…*

Four Scenarios (Millennium Ecosystem Assessment)

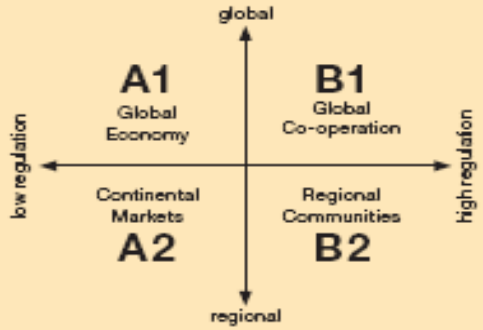
The *Global Orchestration* scenario is based on a socially conscious globalisation, reacting to ecosystem problems when they reach critical stages.

The *Order from Strength* scenario represents a regionalised approach, in which emphasis is on security and economic growth, reacting to ecosystem problems only as they arise.

The *Adapting Mosaic* scenario is also a regionalised approach, but one that empha-sises proactive management of ecosystems, local adaptation, and flexible governance.

The *TechnoGarden* scenario sees a globalised approach with an emphasis on green technology and a proactive approach to managing ecosystems.

Four Scenarios (EUruralis)



Five Scenarios (SCAR Foresight Report)

A "baseline-like" Scenario:
Identifies an emerging trend towards competitiveness, disruption in agriculture, largely due to globalisation.

Disruption Scenario: Climate Shock
Focus on climate change and the acceleration of related environmental impacts as the key drivers.

Disruption Scenario: Energy Crisis
Focus on energy and "industry-manipulated" acceleration of related economic and societal impacts as key drivers.

Disruption Scenario: Food Crisis
Focus on food, health, and society as key driving forces jointly determining a more consumer-oriented research.

Disruption Scenario: Cooperation with Nature
This scenario focuses on society and science as key joint drivers evolving in a beneficially symbiotic relationship.

Five Scenarios (PRELUDE)

Great Escape Scenario – A Europe of Contrasts
- international trade (globalisation)
- decreasing solidarity
- reduced policy intervention

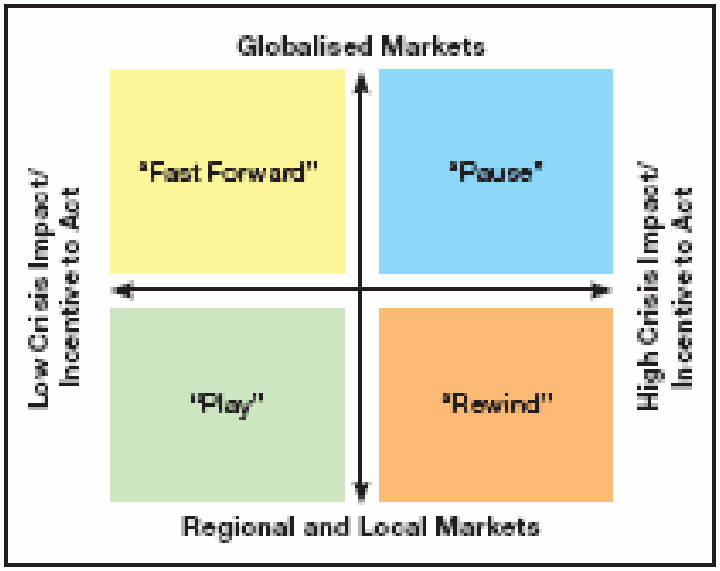
Evolved Society Scenario – A Europe of Harmony
- energy scarcity (and shift to renewable energy sources)
- growing environmental awareness
- policy intervention (rural development)

Clustered Networks Scenario – A Europe of Structure
- population dynamics (ageing)
- international trade (marginalisation of agriculture)
- policy intervention (spatial planning)

Lettuce Surprise U Scenario – A Europe of Innovation
- technological innovation (including surprises)
- growing environmental awareness
- reduced policy intervention (decentralisation)

Big Crises Scenario – A Europe of Cohesion
- growing environmental awareness (after crises)
- growing solidarity
- policy intervention (centralisation)

- MA – Millennium Ecosystem Assessment (MA, 2006)
- EUruralis – EUruralis assessment (EUruralis, 2006 and Westhoek et al., 2006)
- PRELUDE – EEA's land use scenarios (EEA, 2006 and EEA, 2007)
- SCAR – EU RTD's Standing Committee on Agricultural Research (EU, 2007)



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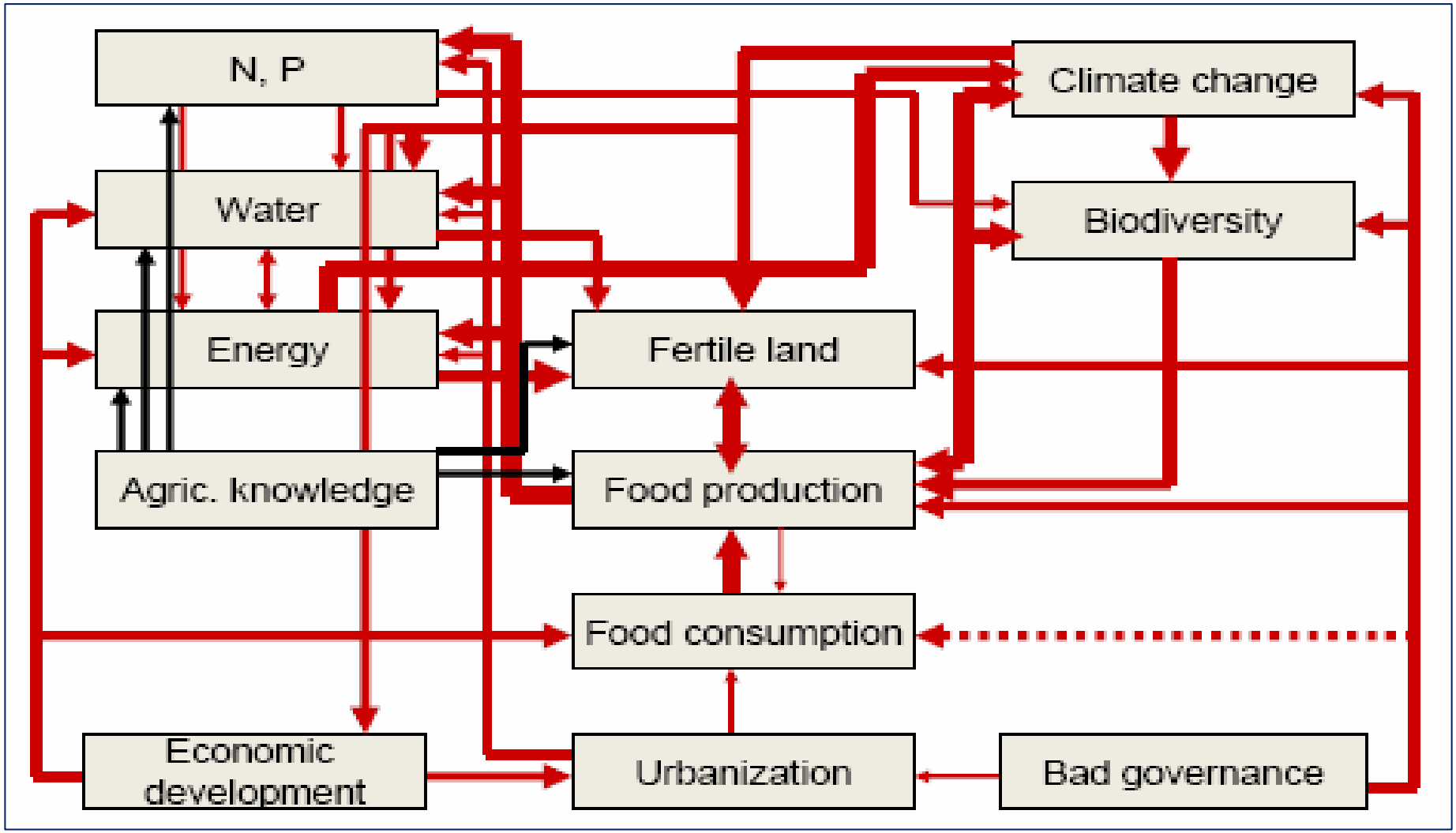
Analysis of Interactions betweeen scarcities of global food system



(Evans, 2009)

New competition for land use: interactions and feedbacks[2]

Increased energy & materials demand

Petrochemical resources

Increased & changing food demand

LAND USE

Biomass for energy and materials

Global climate change

Connections to the Bio-economy

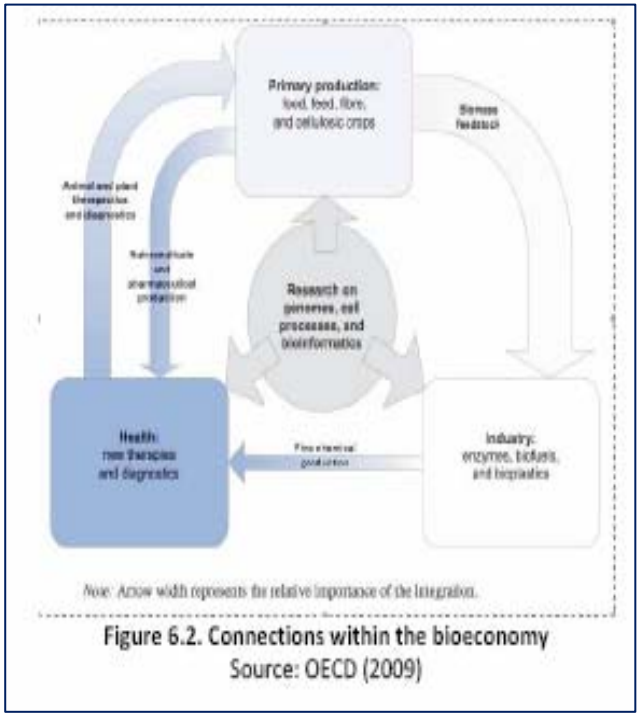
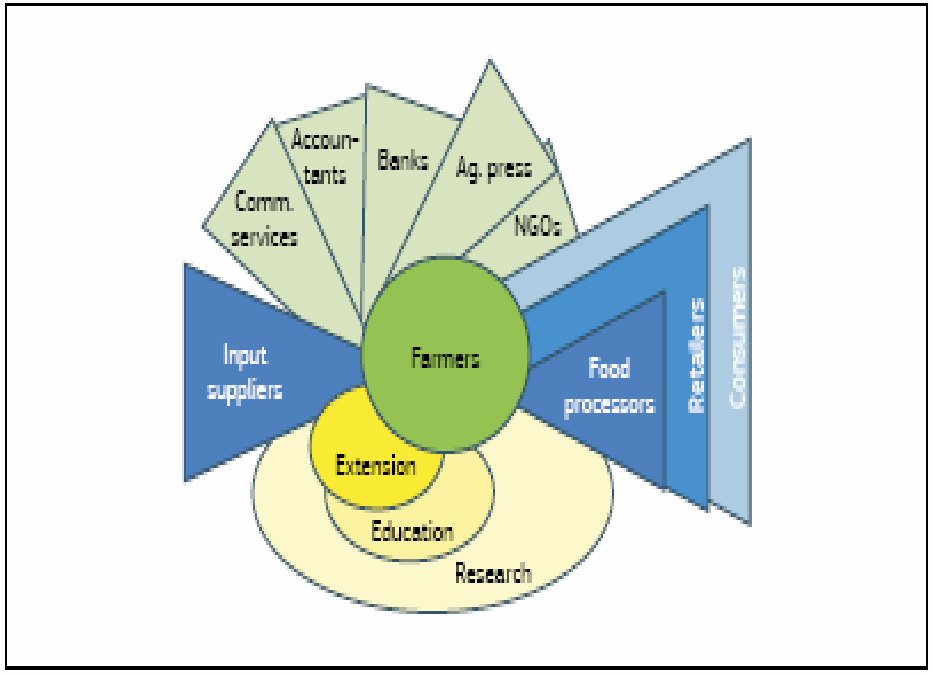
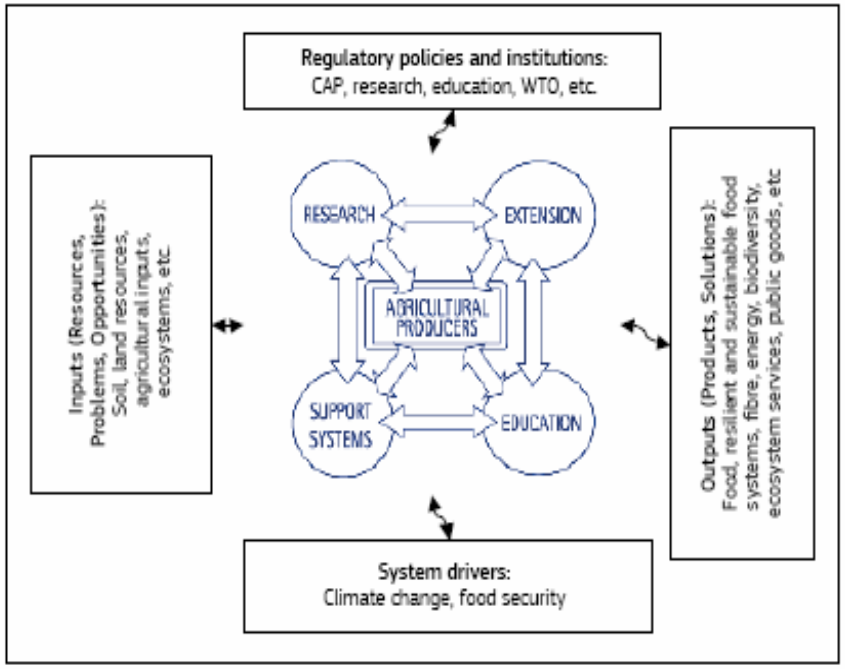


Figure 6.2. Connections within the bioeconomy
Source: OECD (2009)

[2] *Harvey and Pilgrim, 2011*

AKIS- Agricultural Knowledge and Innovation Systems in Transition, 2012

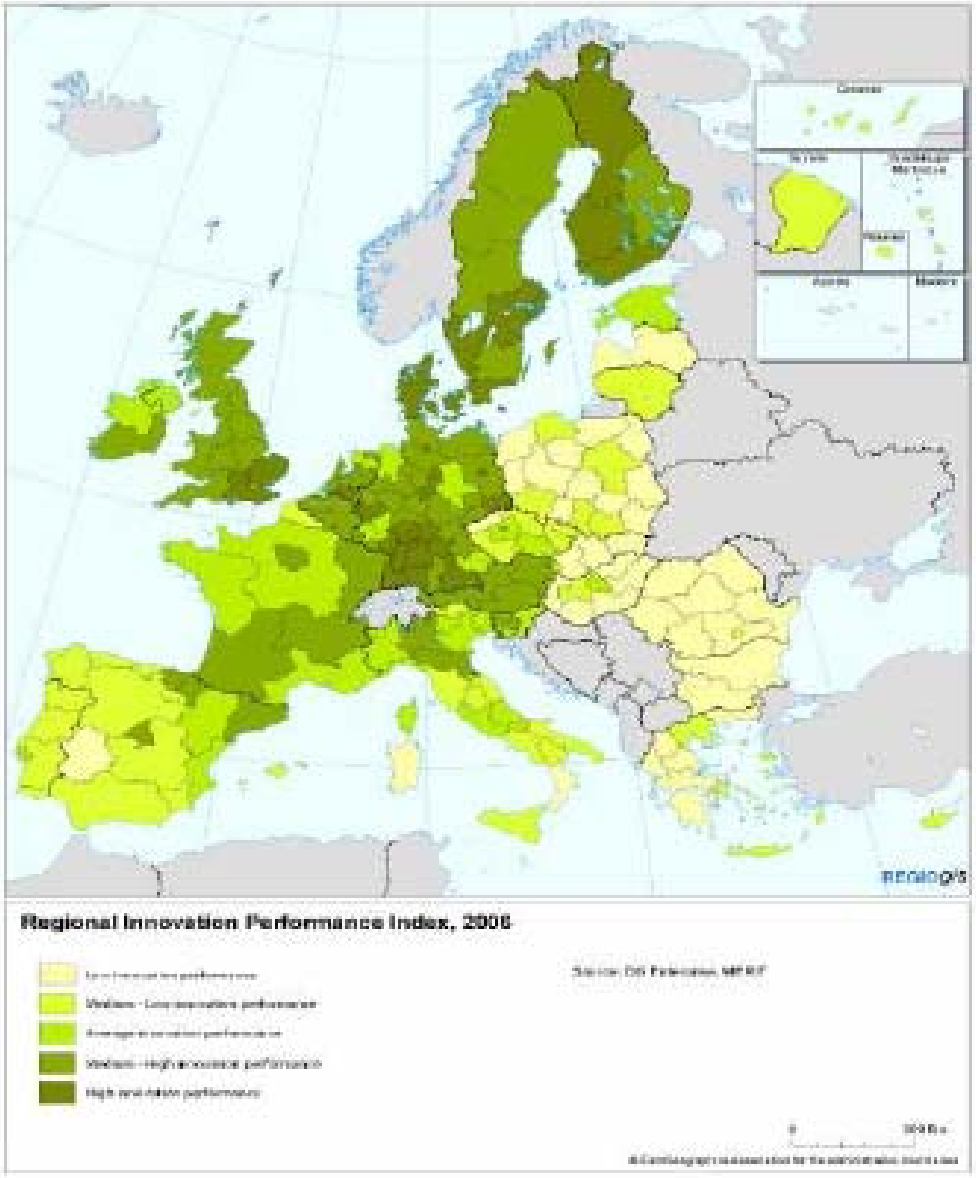




Actors in the AKIS, relevant for agriculture innovation in the Food Chain

A model of AKIS, under transformation[1]

[1]*EU SCAR, 2012, Agricultural Knowledge and Innovation systems in transition, Brussels*



Regional Innovation Performance and Actors in AKIS

Socio-economic system

Public decision making

Information and knowledge system

End users (consumers)

3rd SCAR Foresight Exercise, Sustainable food consumption and production in a resource-constrained world, 2011

Can INNOVATION answer to research questions for European food systems ?

- **How could crises (e.g., energy crisis, health crisis, water stress, terrorism) affect food systems**?

- **What dynamics govern risk perception and consumer response**?
How does society respond to food scares?

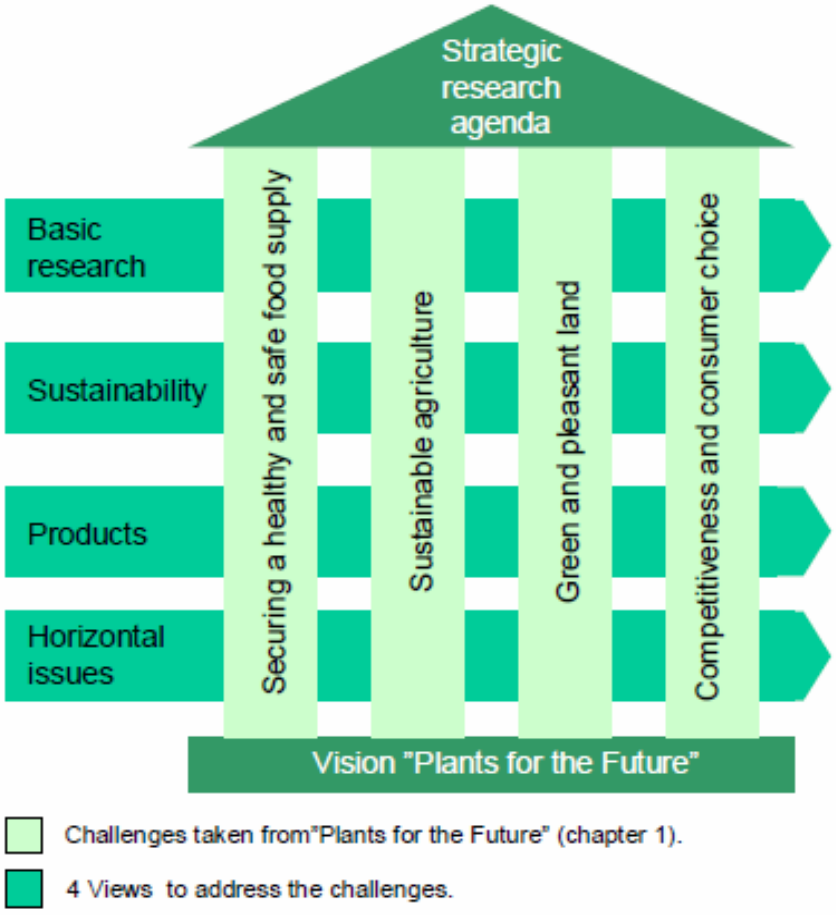
- Can local references, production methods, product variety, feed supply, etc. be maintained in a globalised market and what is the role of SMEs in this? If so, how?

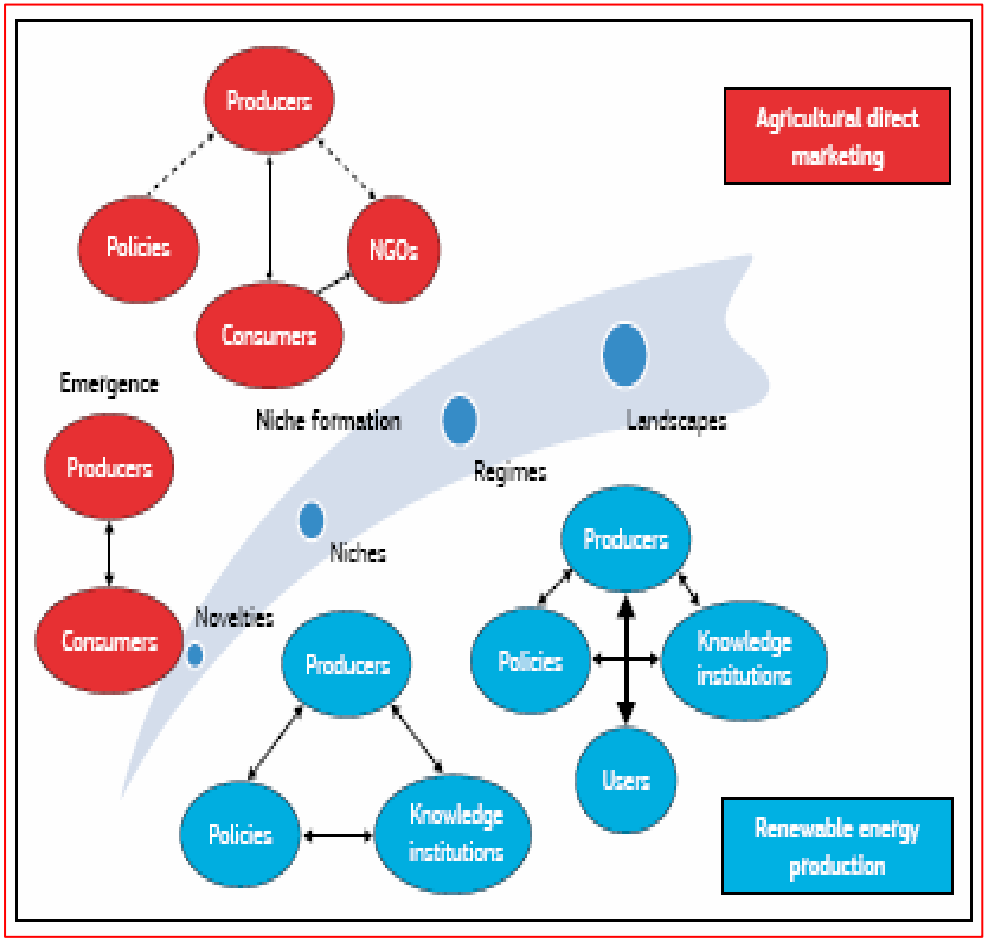
- Would a continued move towards globalised markets clash with local preferences , e.g. **is there a risk of a "cultural back flash" to globalisation of food systems**?

- Can **we better substantiate the strengths/weaknesses of European agriculture**?

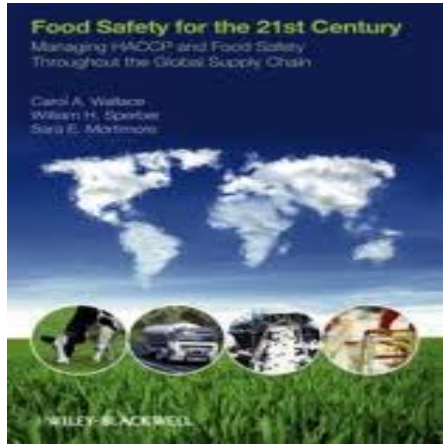
- What are trade-offs and **implications for developing countries vs. price vs. health?**

Innovation development and actors' diversity





Message for the future: keep the balanced food chain and live healthier...



TRADITION and MODERNITY