What is innovation and how does it work ?

New challenges and potential ways to address them

Philippe **Baret**
Université de Louvain, Earth and Life Institute

1. What is innovation ?

4 What is innovation ?

- **Innovation is "the production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres (…) It is both a process and an outcome." - Cossan and Apaydin (2010)**
- **'Innovation is defined as the adoption of an idea or behaviour whether a system, policy, program, device, process, product or service that is new to the adopting organisation. -** Damanpour (1992)
- **Innovation is more than an invention or an technology that are objects. It is the match of an object and a socio-economic context.**

5 The process of innovation

- In an industrial context
- Research -> Development -> Use
- Are agricultural systems similar to industrial context ?
  - Diversity of actors
  - Degrees of uncertainties
  - Biological dimension
  - Temporal dimension

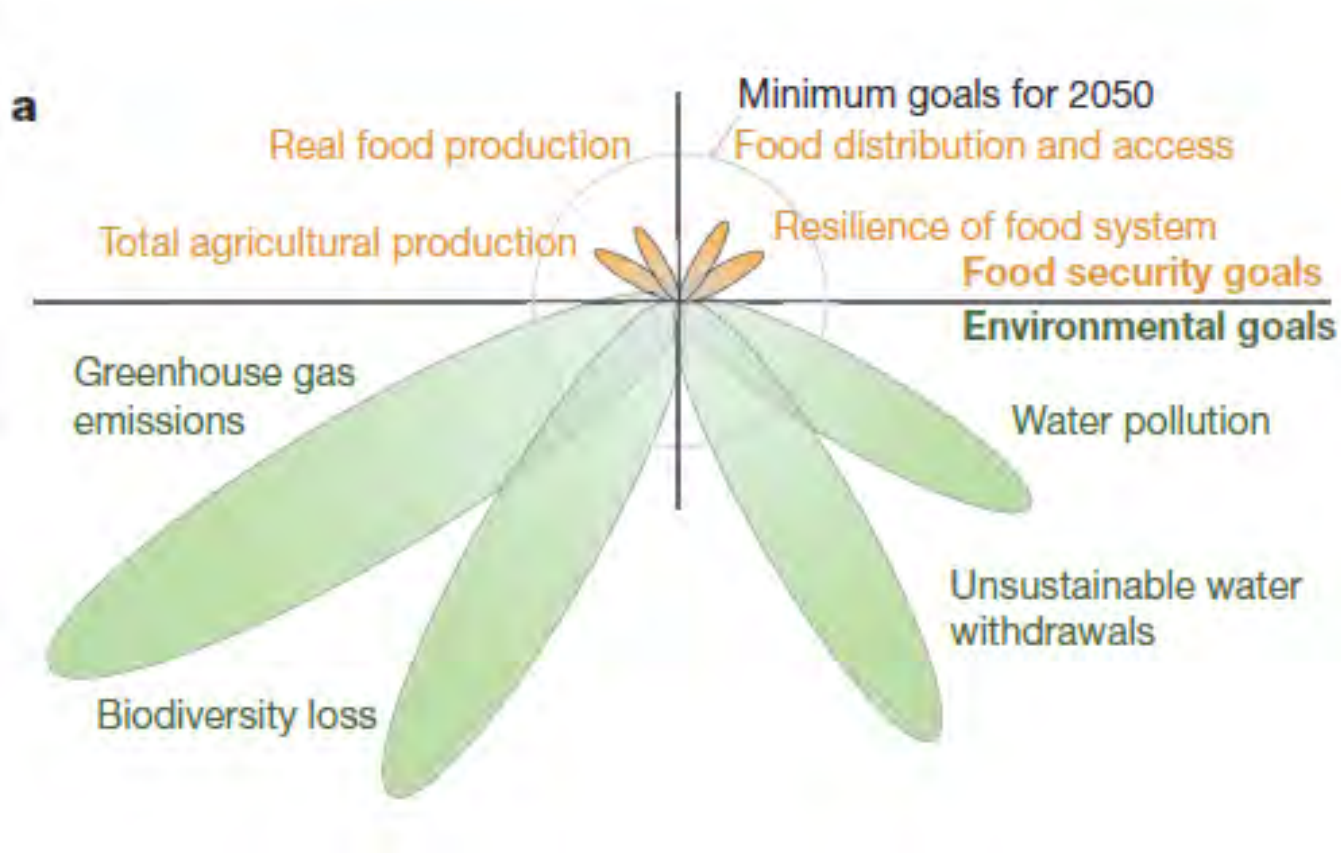
6 The nature of innovation

- The type of innovation we are after requires not only innovation in technology, but also in skills and competencies of people and innovation in regulations and institutional arrangements - H.C. van Latesteijn and K. Andeweg 2011

- system ->/<- context

2. New challenges, new innovations

8 Agriculture faces new challenges



/ challenges

9 A new agenda for world agricultures

- **Food systems must ensure the availability of food for everyone**
- **Agriculture must develop in ways that increase the incomes of smallholders**
- **Agriculture must not compromise its ability to satisfy future needs**

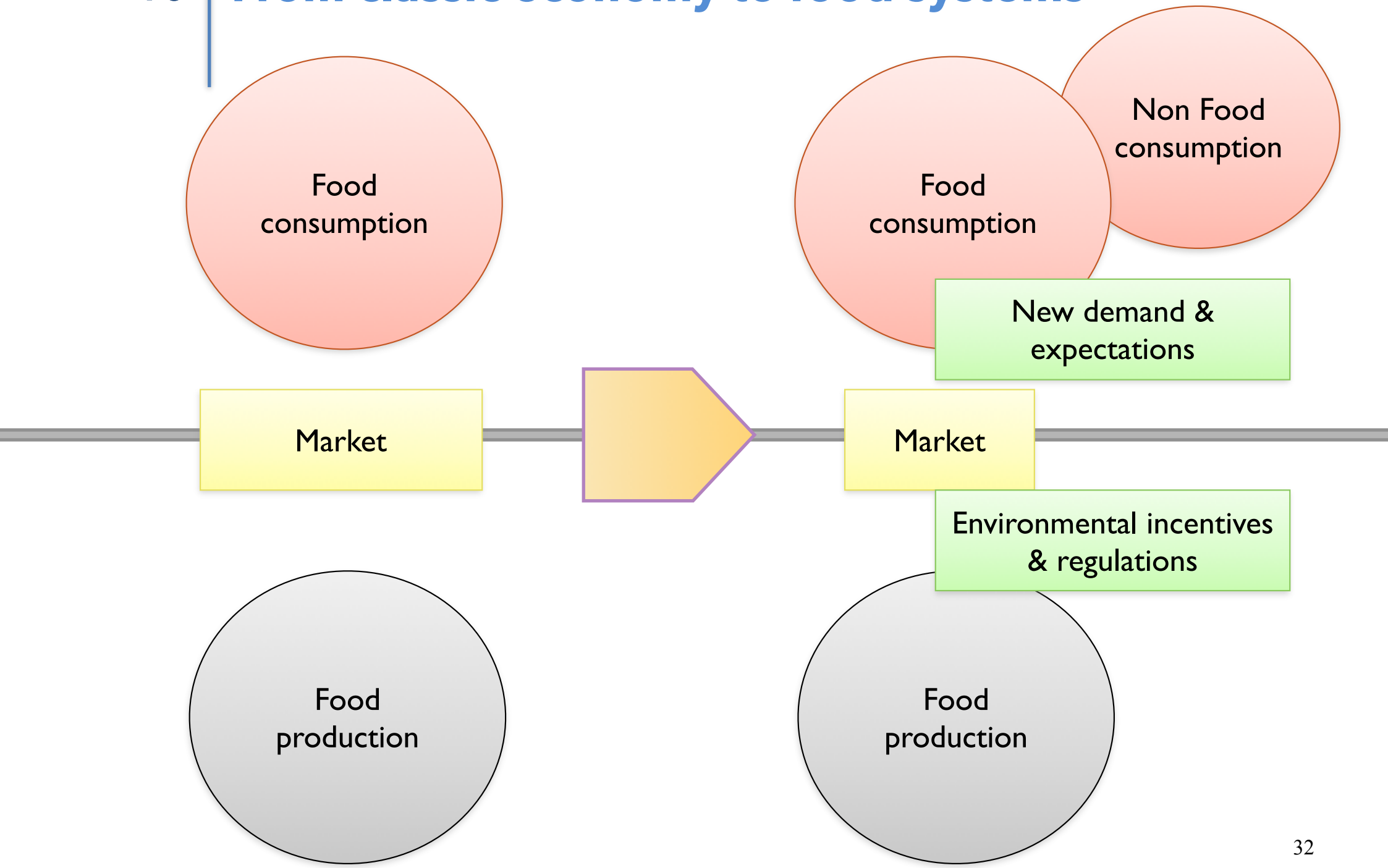
Right to food

Equity

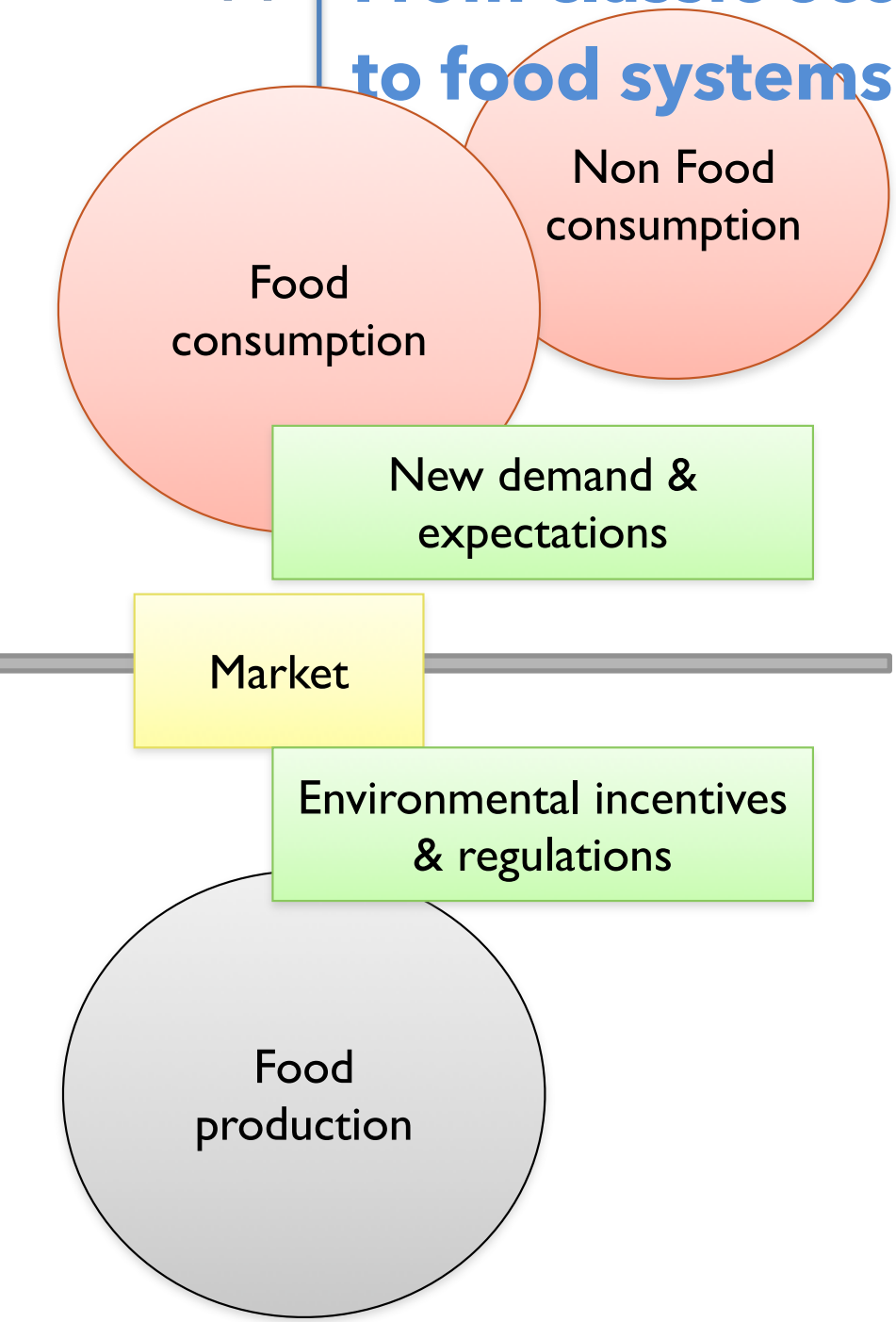
Sustainabiliy

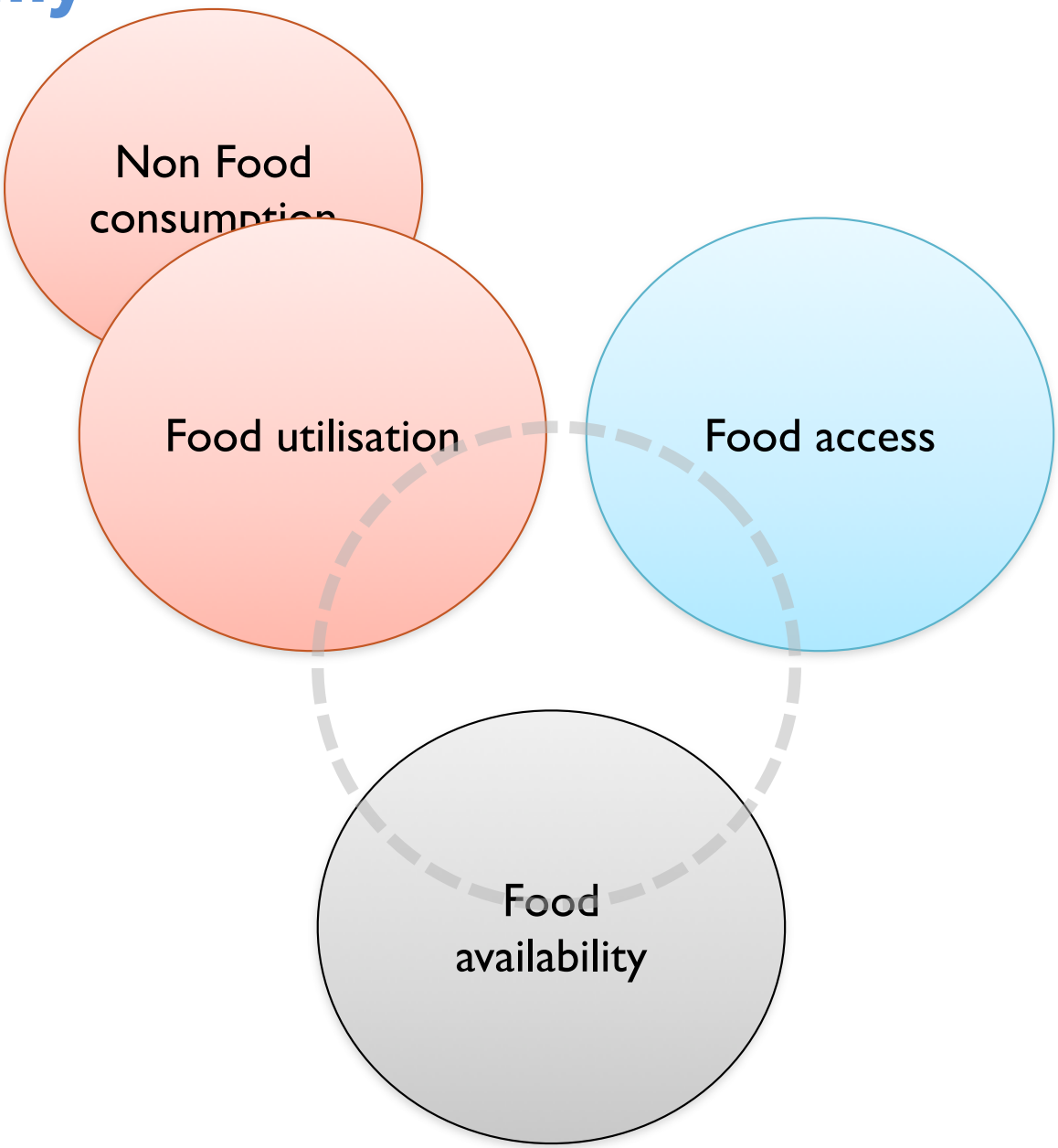
Report submitted by the Special Rapporteur on the right to food, Olivier De Schutter (UN, 2010)

10 From classic economy to food systems



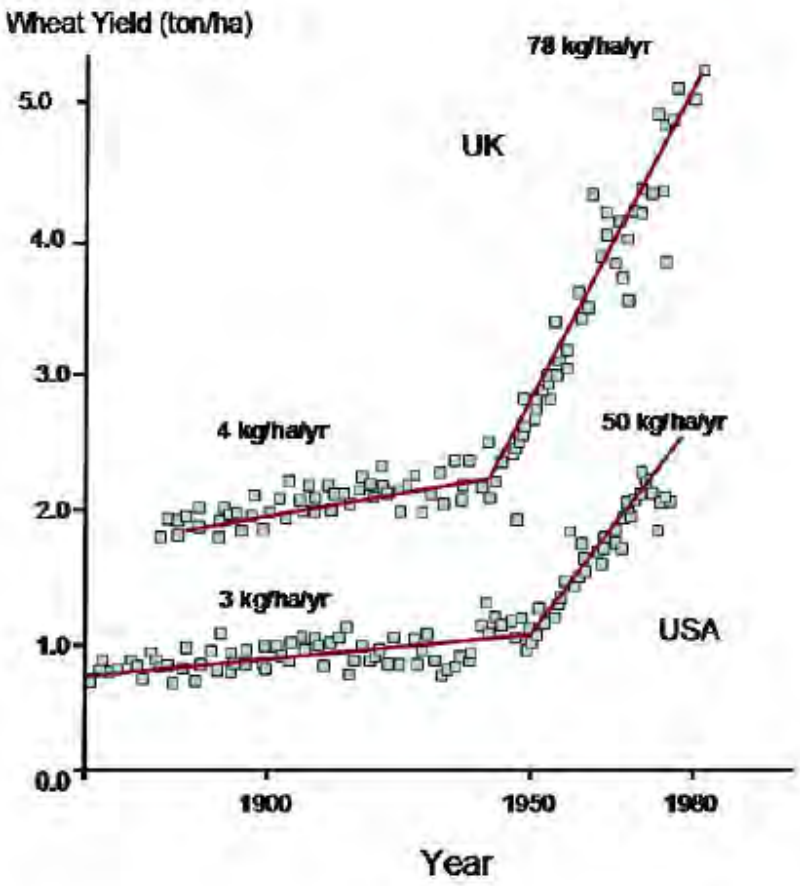
11 From classic economy to food systems





3. A systemic view of innovation

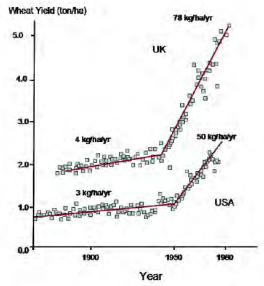
13 From plot to …



Food availability

Fig. 1.2. Annual productivity rise of wheat production in the UK and USA, 1850–1980 (Van Latesteijn 1998).

14 | … food system



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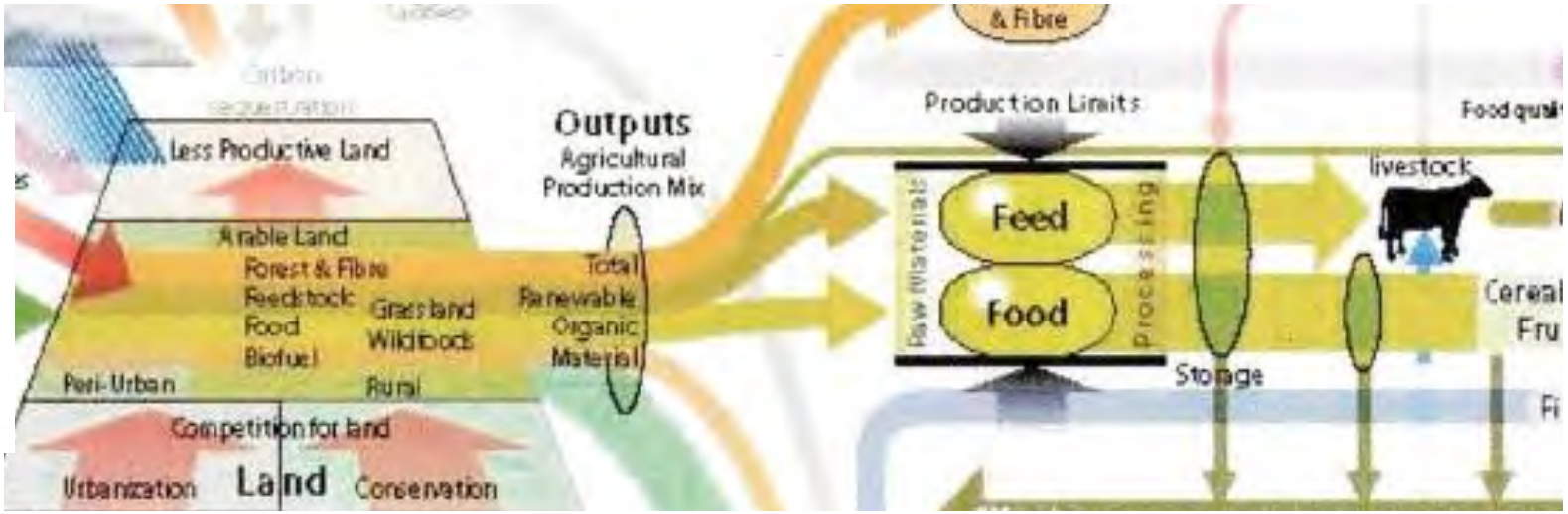
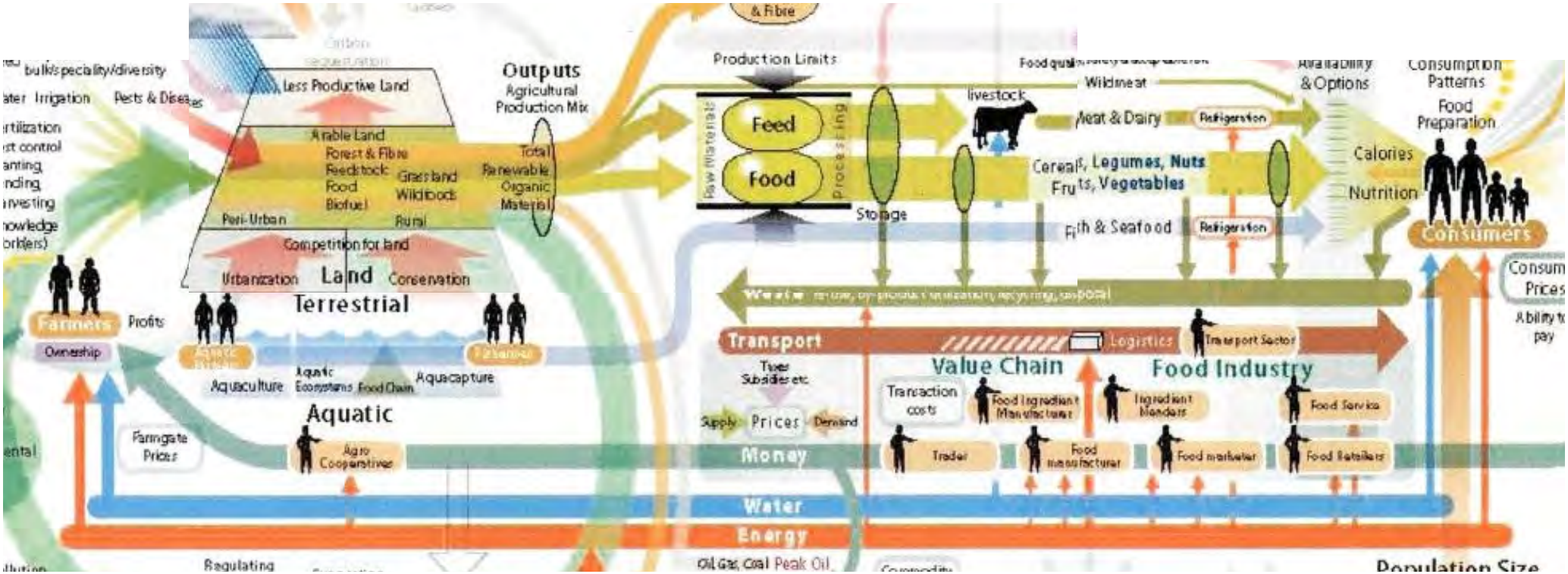
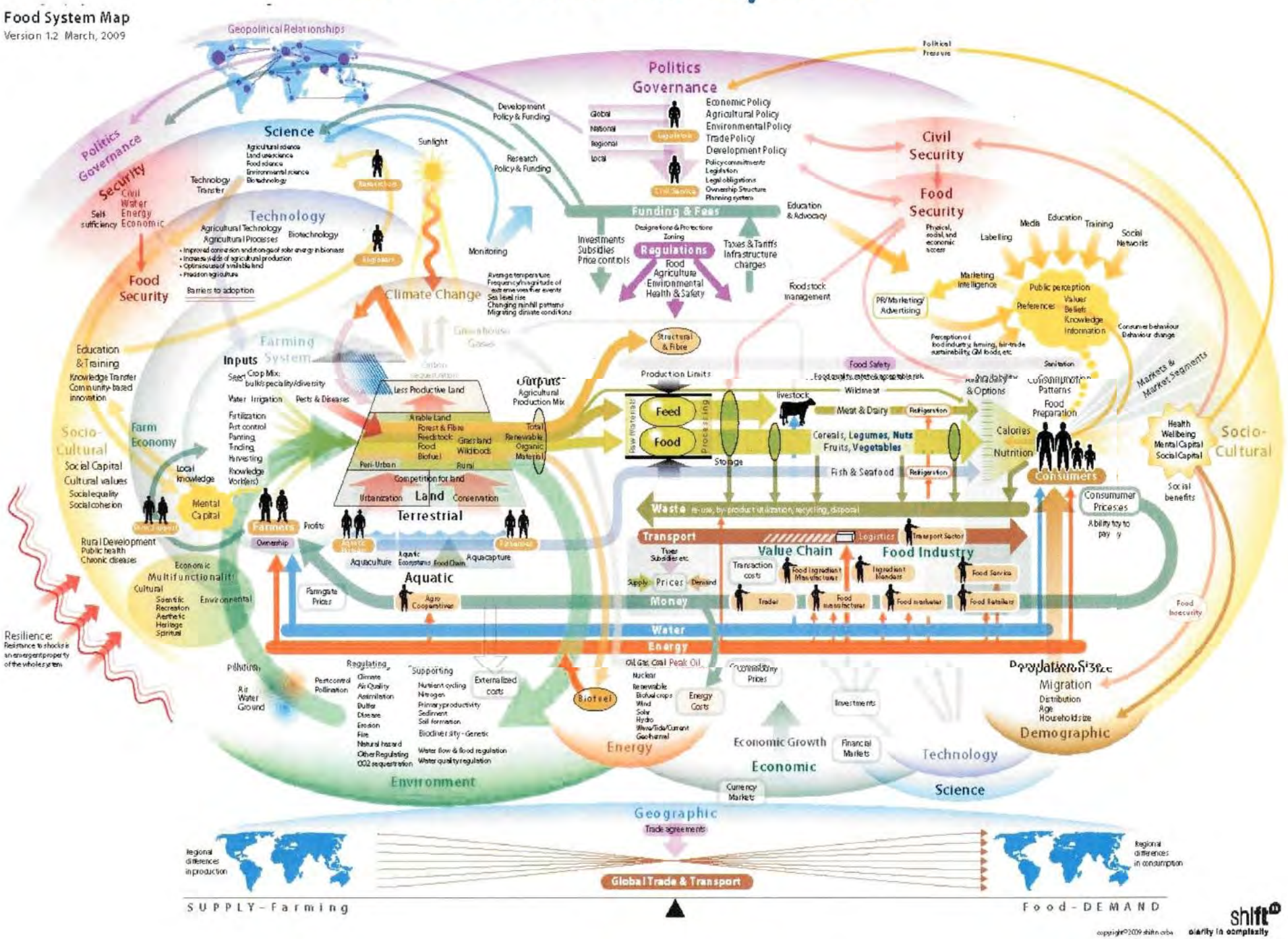


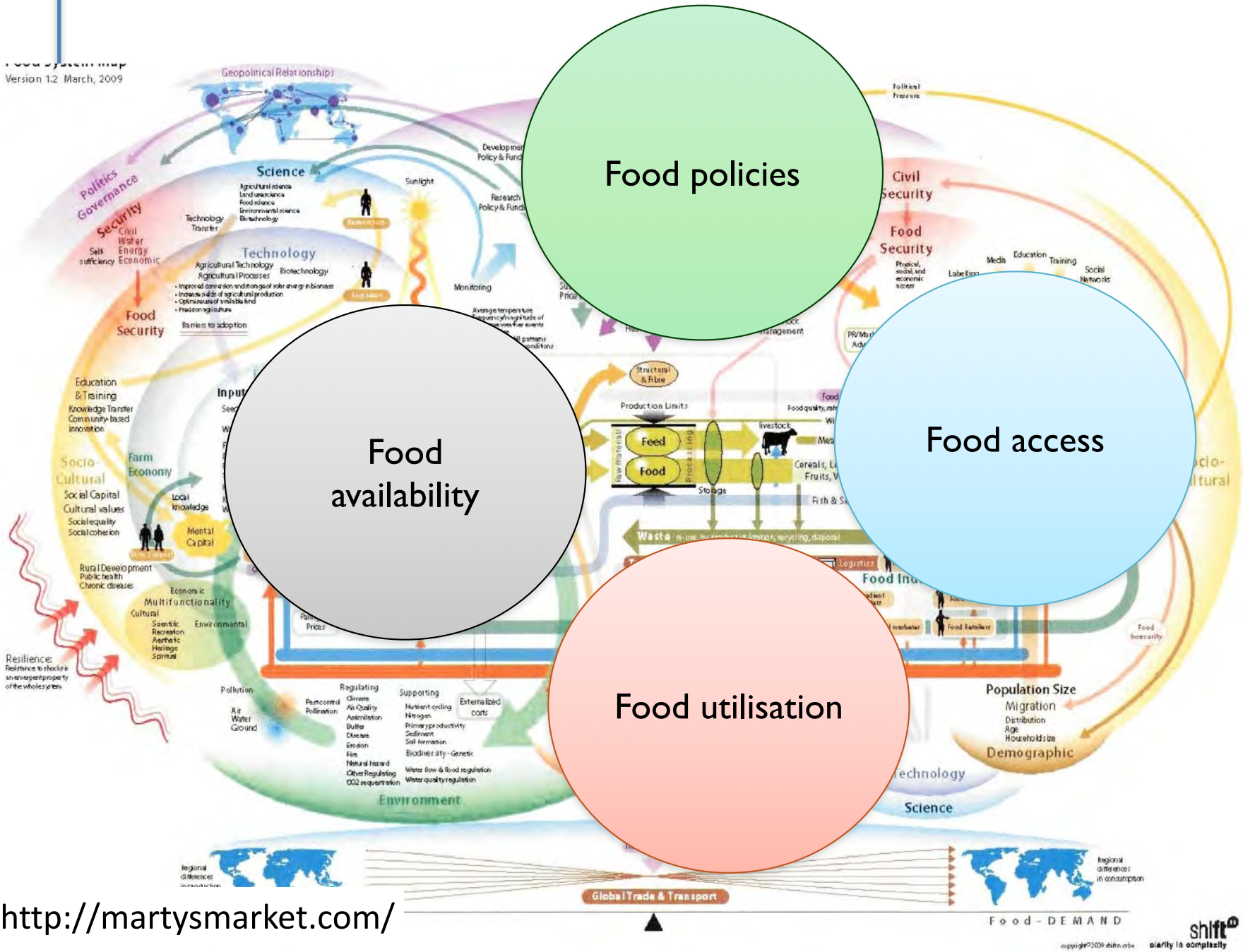
15 | … food system



The Global Food System



… food system



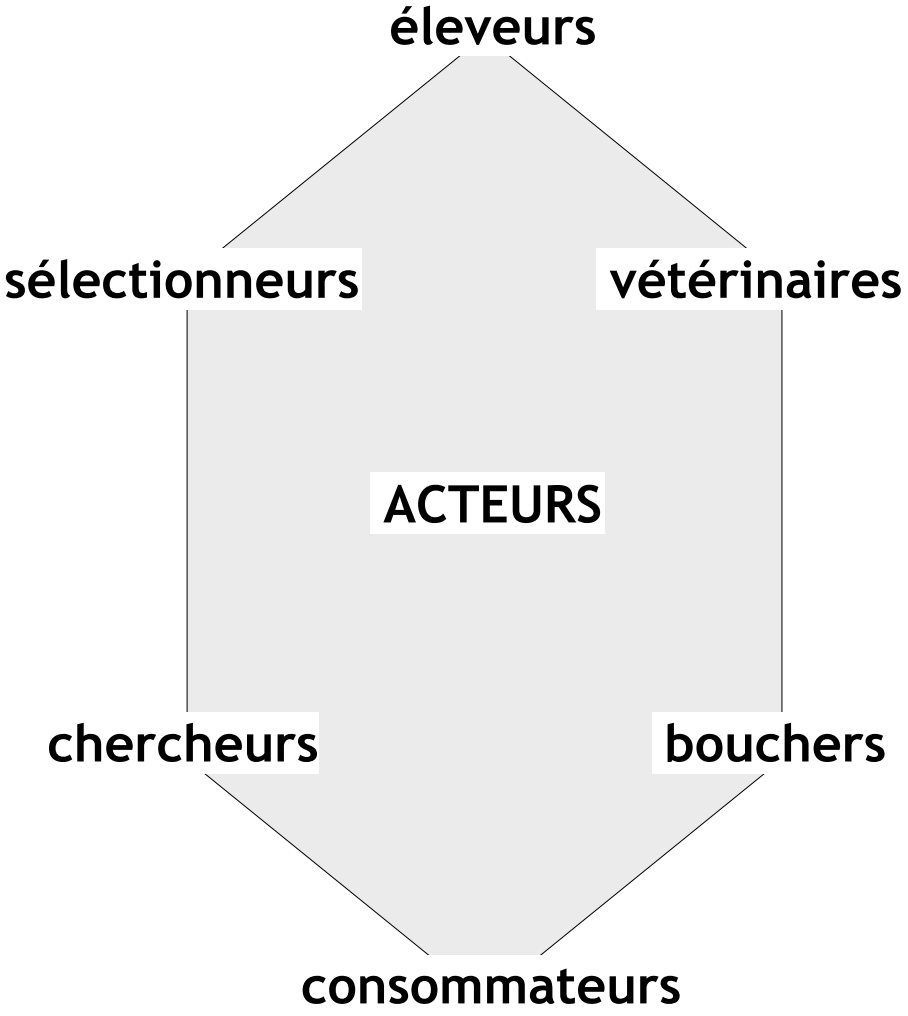
Source : http://martysmarket.com/

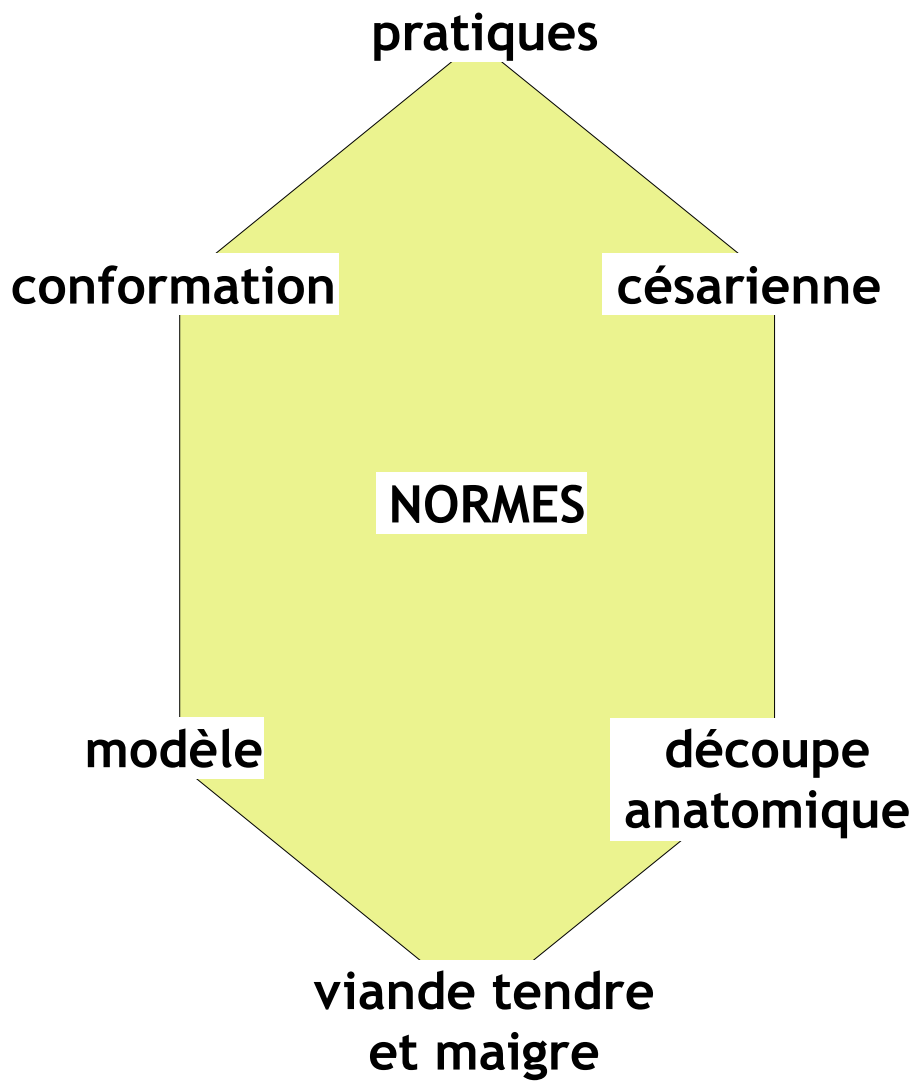
Does a system approach matter ?

- Innovation is a system reconfiguration
- Sustainable development asks for system innovation
- How to think system & innovation ?


Photo : Arthus Bertrand

Le Blanc Bleu Belge : généralisation





21 Relevancy implies a problem driven systemic approach

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How agricultural research systems shape a technological regime that develops genetic engineering but locks out agroecological innovations

Gaëtan Vanloqueren*, Philippe V. Baret

Earth and Life Institute, Université catholique de Louvain, Belgium

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ABSTRACT

Agricultural science and technology (S&T) is under great scrutiny. Reorientation towards more holistic approaches, including agroecology, has recently been backed by a global international assessment of agriculture S&T for development (IAASTD). Understanding the past and current trends of agricultural S&T is crucial if such recommendations are to be implemented. This paper shows how the concepts of technological paradigms and trajectories can help analyse the agricultural S&T landscape and dynamics. Genetic engineering and agroecology can be usefully analysed as two different technological paradigms, even though they have not been equally successful in influencing agricultural research. We used a Systems of Innovation (SI) approach to identify the determinants of innovation (the factors that influence research choices) within agricultural research systems. The influence of each determinant is systematically described (e.g. funding priorities, scientists' cognitive and cultural routines etc.). As a result of their interactions, these determinants construct a technological regime and a lock-in situation that hinders the development of agroecological engineering. Issues linked to breaking out of this lock-in situation are finally discussed.

Does a system approach matter ?

- Innovation is a system reconfiguration
  - Belgian Blue
  - Holstein dairy cattle
- Sustainable development asks for system innovation
  - Industrial ecology
- How to think system & innovation ?

Sustainable development asks for system innovation

- new technologies ('hardware')
  - new antibiotics
- new skills and competencies ('software')
  - local food market
- system innovation ('sysware')
  - closing the nitrogen loop
- new regulation and institutions ('orgware')
  - internalisation of externalities

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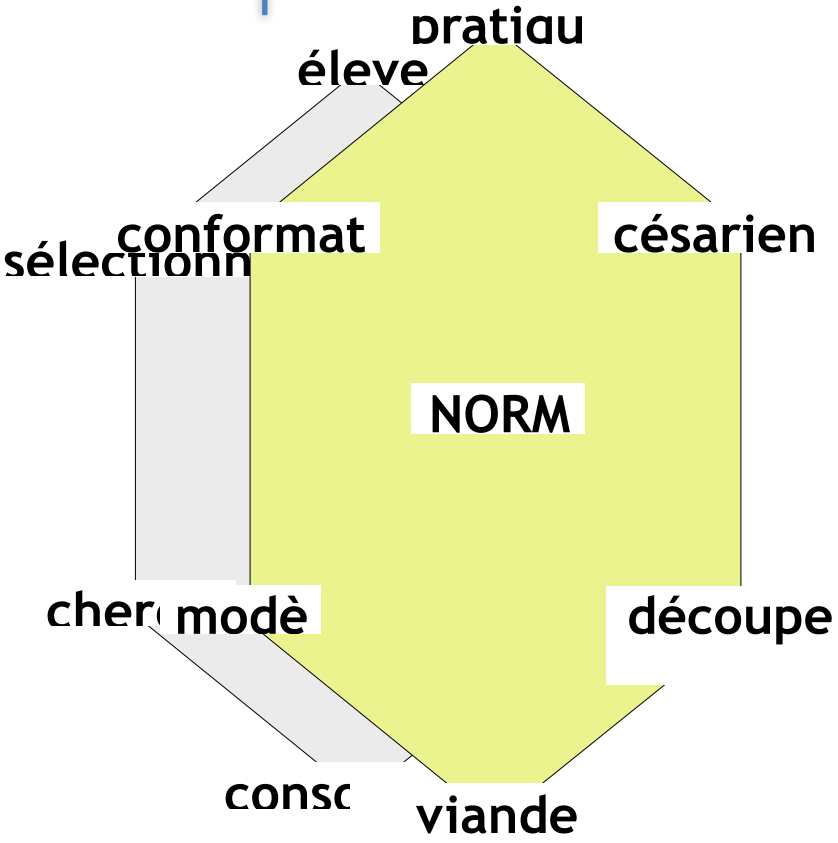
How to think system & innovation ?

- Identification
  - Acknowledge the system
  - Identify actors and norms
  - Point to lock-ins
- Consider options
  - More than one innovation fits the system
  - All innovations are not possible
- Implementation
  - From adoption to transdisciplinarity
  - Out of the box thinking - wicked innovations

Application : new options for Belgian Blue



- ban caesarian
- propose new meat quality
- from concentrates to grazing
- from young bulls to beef
- ….

Geneva airport
Advertisement for a bank

28 Conclusion

- New challenges for food systems
- System innovations are relevant
- System innovations require system thinking
- Consider options :
  - any innovations is not relevant,
  - a choice of innovation is a choice of pathway for food system

29 Références

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