

*Agriculture: models and conflicts*

*A multifunctional agriculture in the bio-  
economy era:*

*The global and local challenges*

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# 1. The global challenges

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## The context

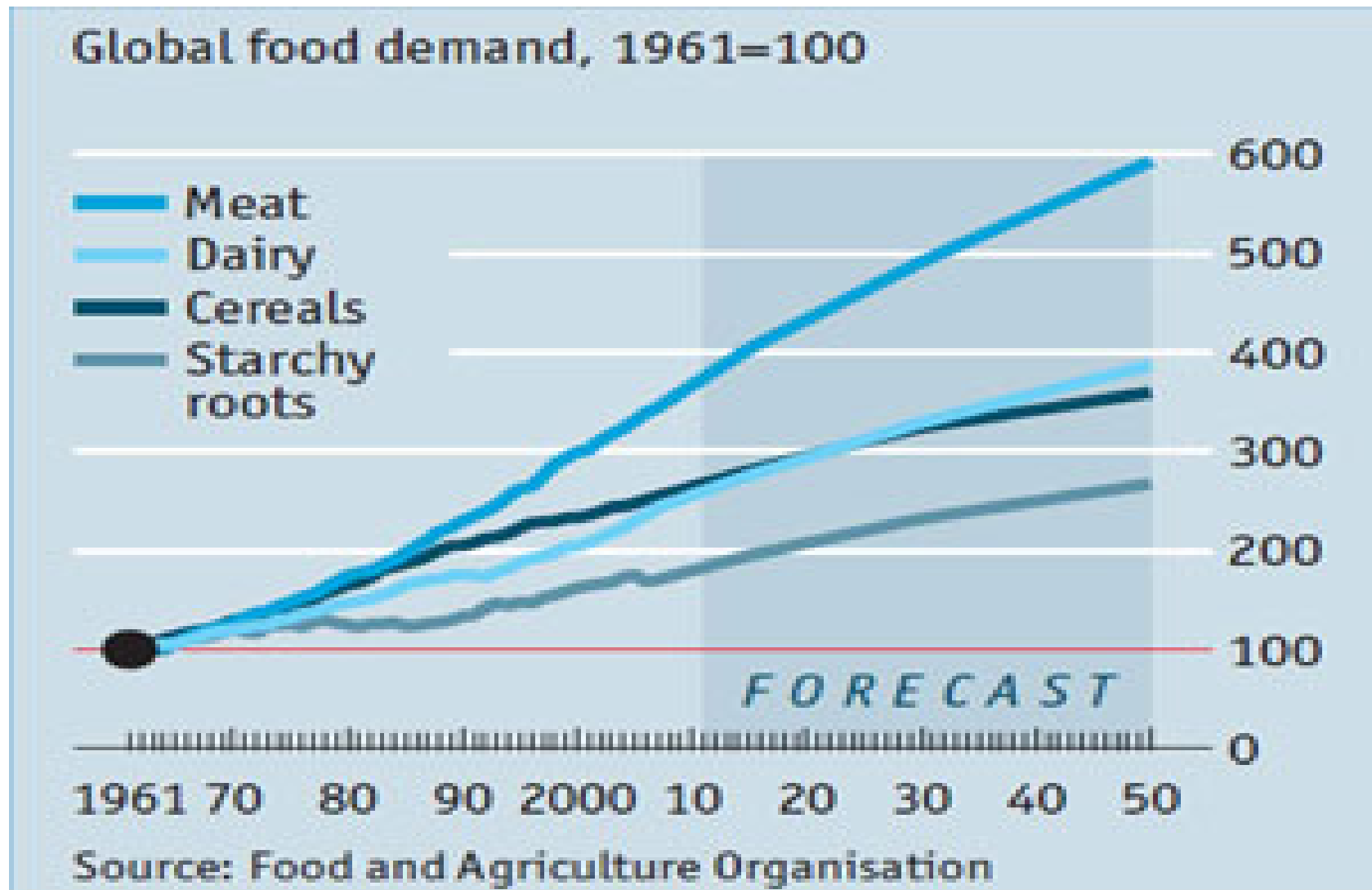
- Growing world population
- Biodiversity decline and climate change
- Price volatility and speculation
- Scarcity of natural resources
- Growing competition for biomass
- Urbanisation and increasing demand for public good services



## World population growth between 2010 - 2025



# Increase in population – increase in food demand



# Deforestation

# Climate change



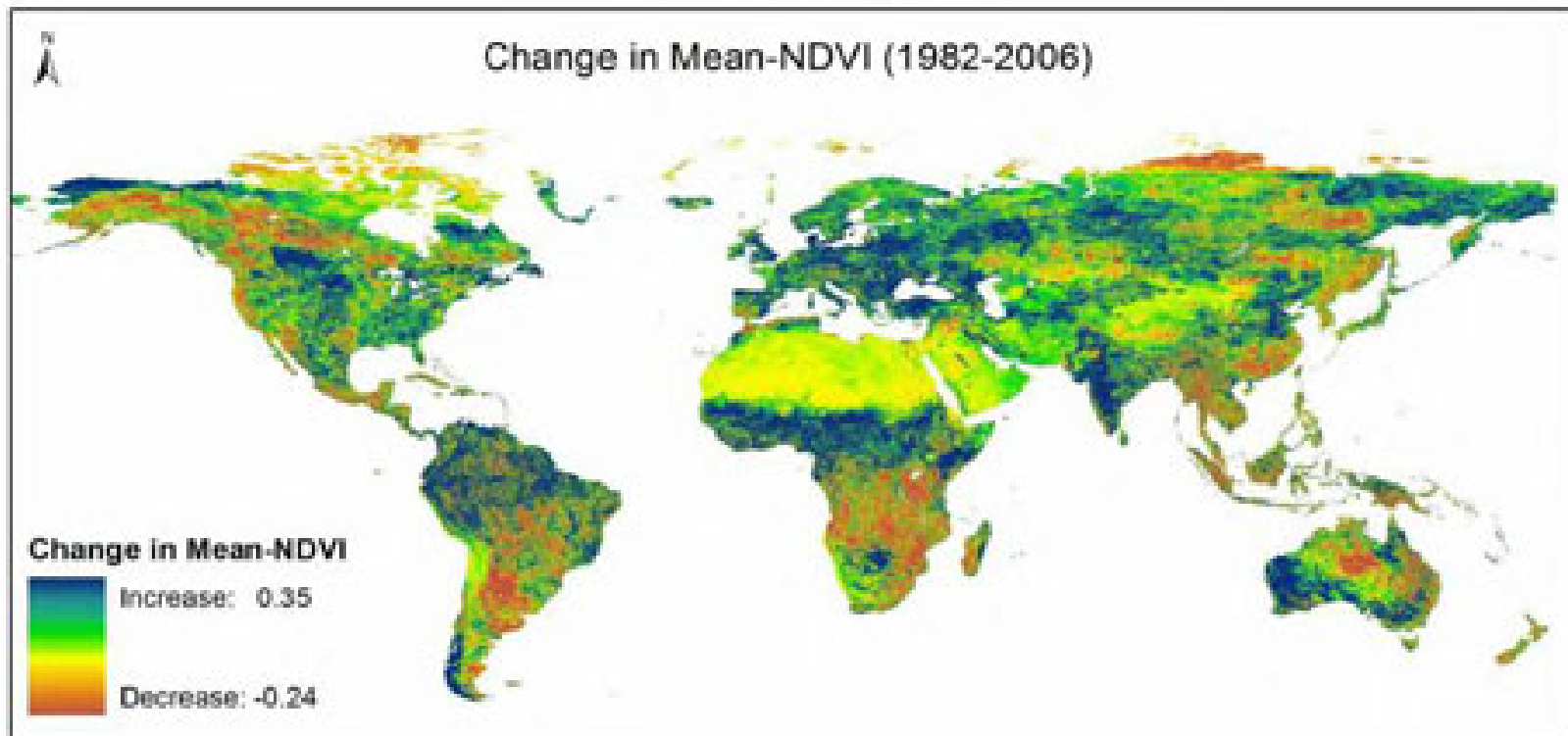
# Price volatility and speculation





# Land shortage and land degradation constrain production

Change in NDVI from 1982-2006  
Baseline: 1982-1986  
Endline: 2002-2006



**42% of the poor live in degraded areas**

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## Total arable land is limited

- Climate change, urbanization and degradation affect arable land
- Protection of forests imposes further environmental limits



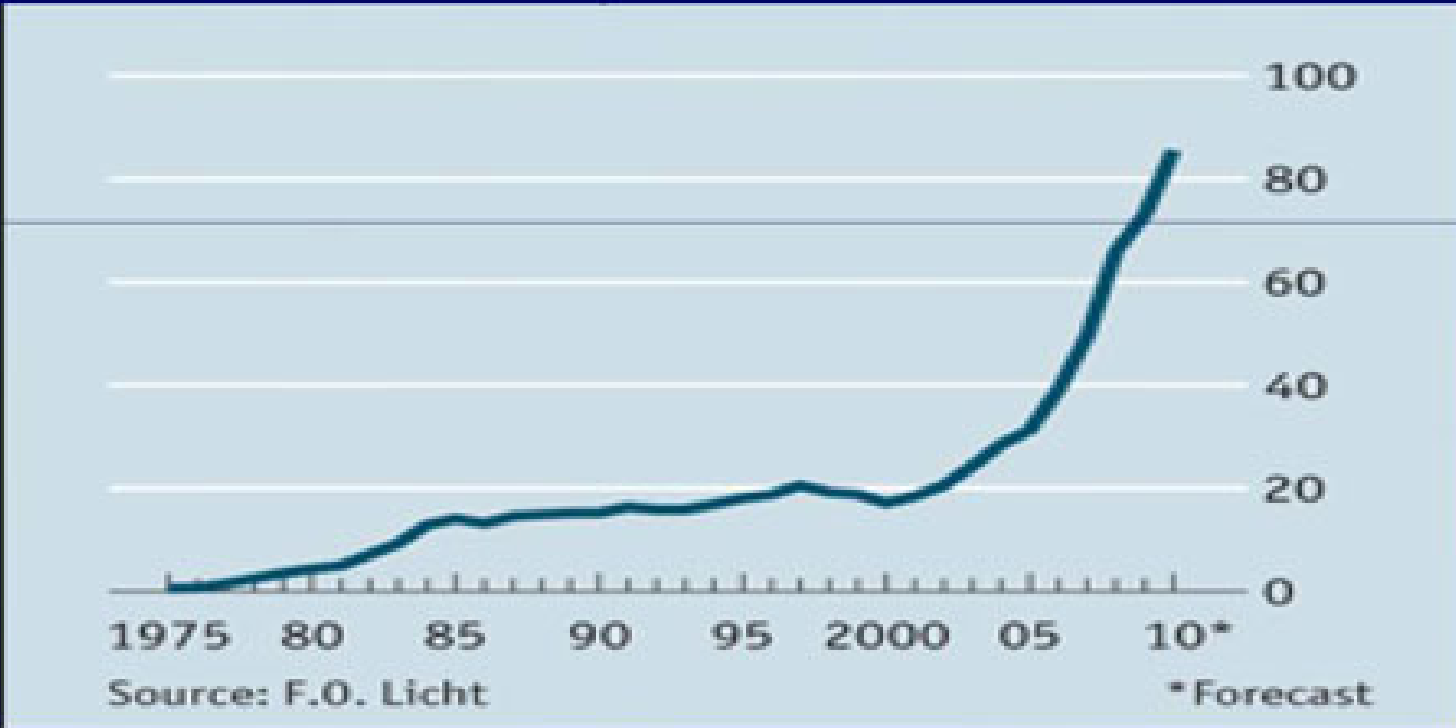
## Growing foreign land acquisitions: internationalization of land use markets



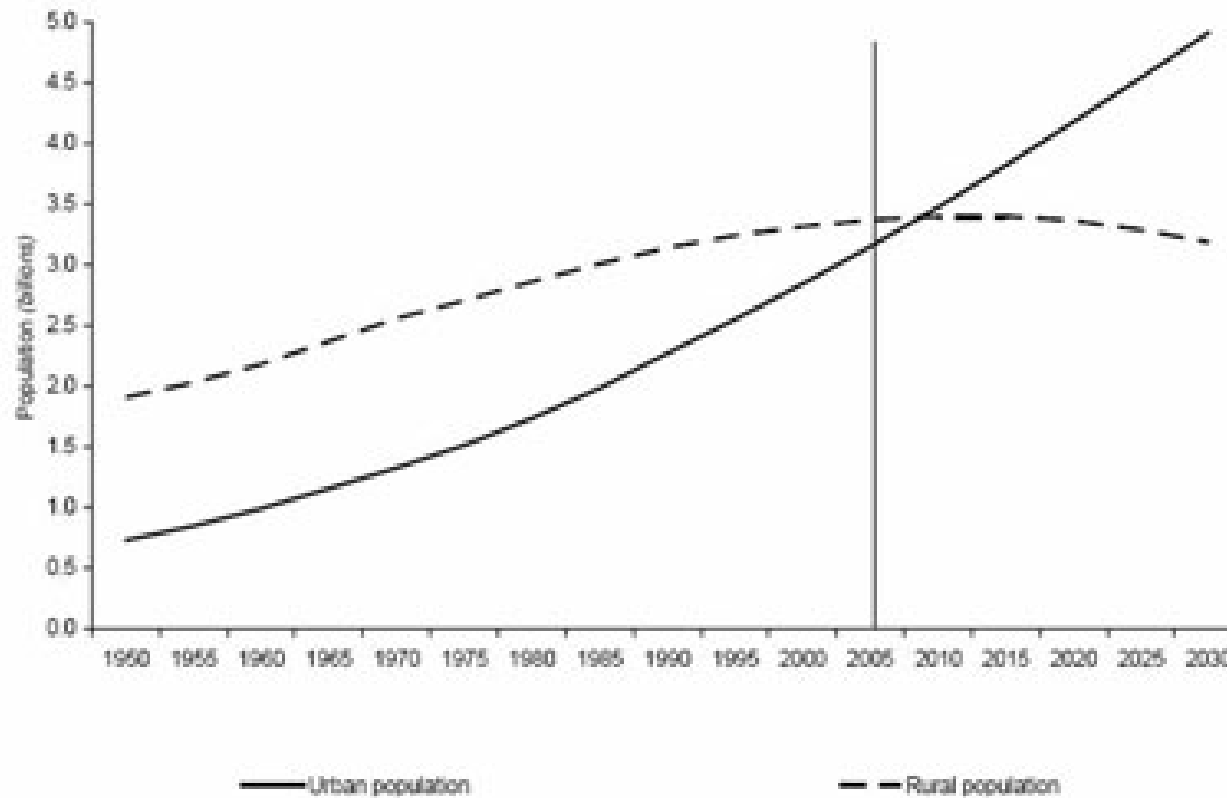
Source: von Braun and Meinzen-Dick 2009,  
with data compiled from media reports 2007-2009.

# Other uses of biomass: feed versus fuel

## Biofuel: ethanol growth (bln liters) *So far a bioeconomy with mixed blessings*



# World wide trend of urbanisation



# The demand for space and public goods and services



## 2. Challenges for EU agriculture

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## Agriculture in Europe

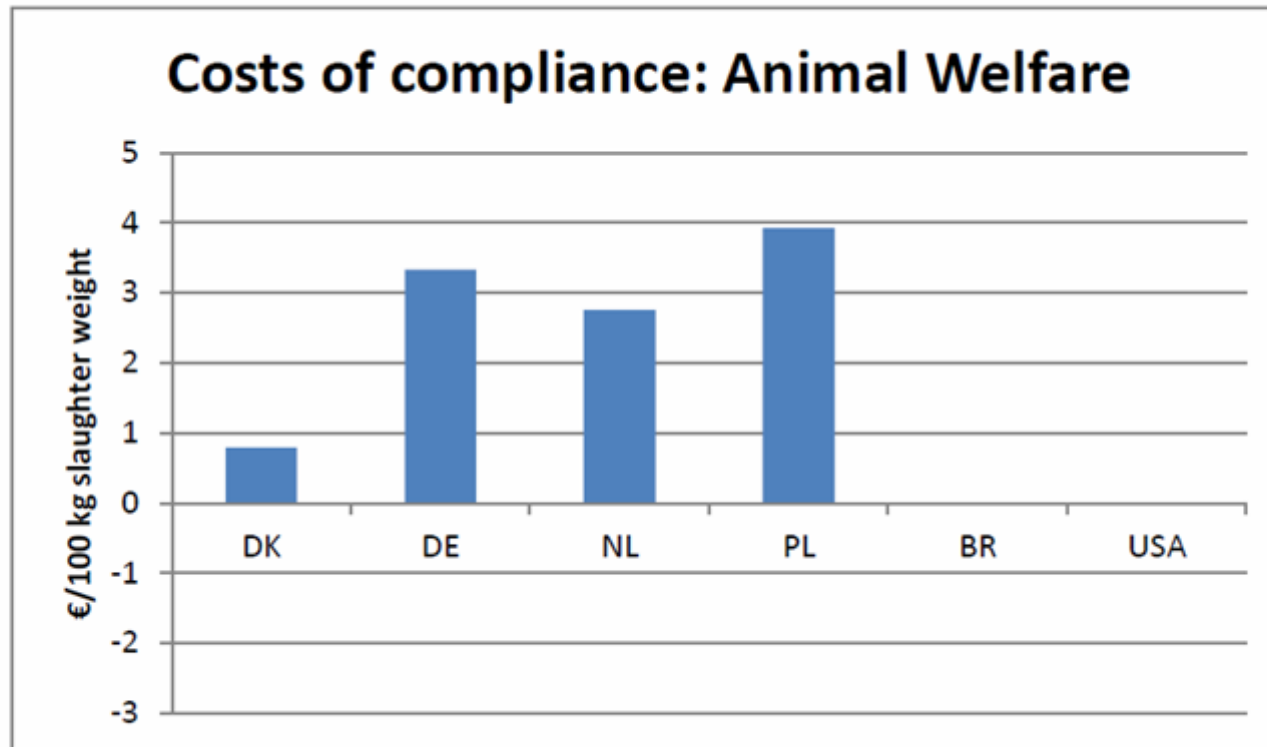
- Highly diversified production possibilities and thus high diversified production systems in the 25 member states
  - High density of population and thus high presence of consumers, but also high pressure of citizens
  - Highly productive agriculture but depending on external (often imported) inputs
  - High labour costs in comparison with competitors
  - Strong regulatory framework resulting in higher costs
-



## EU agriculture : Strong increases in productivity

<b>Productiviteitsstijging NL-ldb</b>	<b>1960</b>	<b>1985</b>	<b>2010</b>
Tarwe (kg/ha)	100	144	210
Aardappelen (kg/ha)	100	144	157
Tomaten (kg/m <sup>2</sup> )	100	183	320
Melkproductie/koe/jaar	100	127	203
Grootgebrachte biggen/zeug/jaar	100	119	179

Figure 2.18 – Costs of compliance with animal welfare legislation for pigs in selected countries



Own calculation

Source: preliminary results of Contract No 30-CE-0467350/00-79 for DG Agriculture and Rural Development.

Figure 2.17 – Costs of compliance with environment legislation for pigs in selected countries

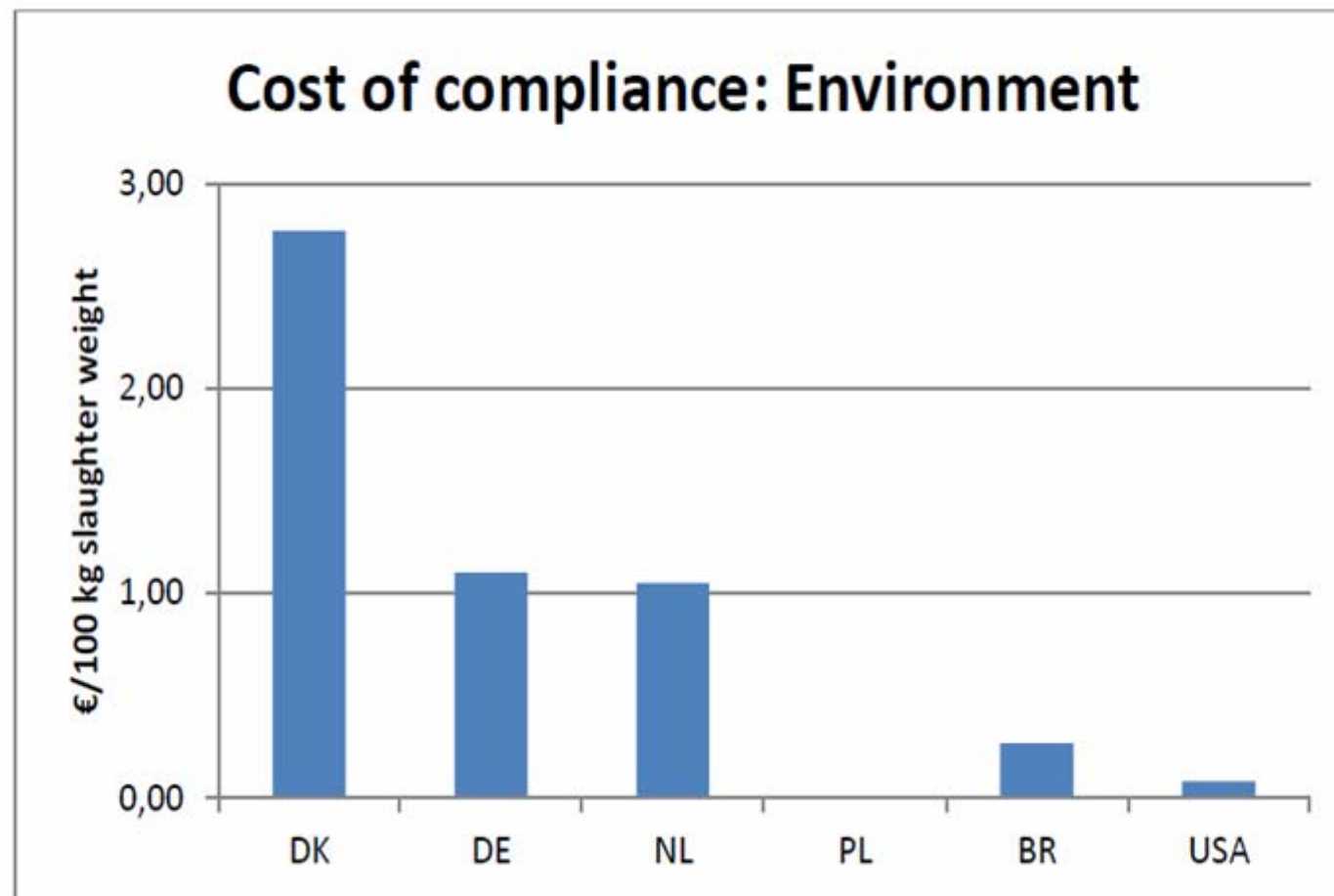
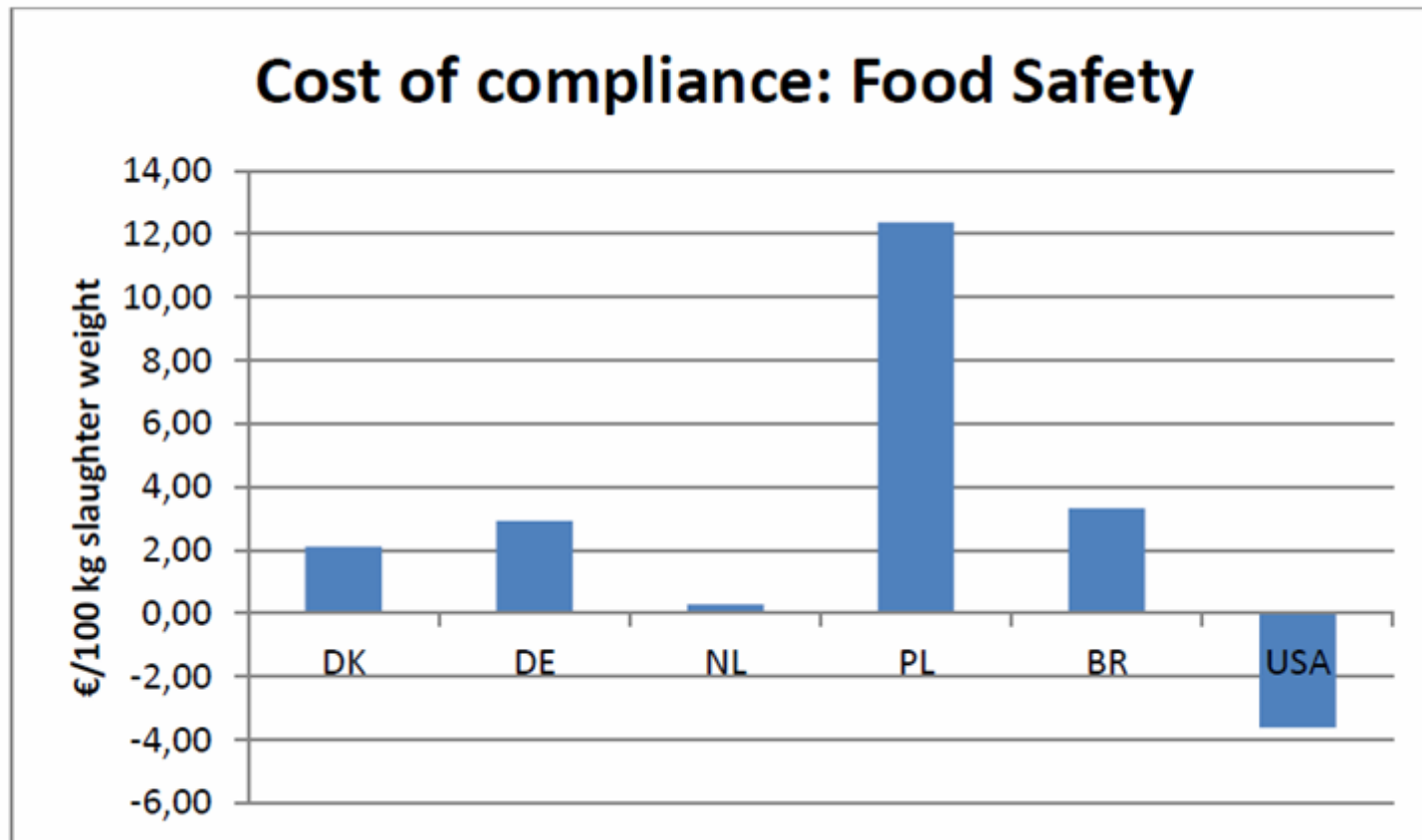


Figure 2.19 – Costs of compliance with food safety legislation for pigs in selected countries



## Fundamental problems

- Price erosion through globalisation
- Cost increases because of increased regulation
- Treadmill of scale enlargement, specialisation, technological progress and labour reduction
- Agricultural policy fighting the symptoms rather than facilitating structural solutions
- Model of intensification is socially questioned
- Need of a new model? Can this be 'multifunctional' agriculture ?

### 3. Multifunctionality and bio-based economy : A basis for innovation ?

## Vision on EU agriculture

The vision on EU agriculture as expressed by EU in 2000:

*“The fundamental difference between the European model and that of our main competitors lies in the **multifunctional role of agriculture** in Europe and in the role it plays in the economy, for the environment, in society and in the conservation of the countryside. Hence the need for maintaining agriculture all over the EU and protecting the farmers’ income” (EC, 2000)*

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# The multifunctionality paradigm

- Multifunctionality means to accept that farming combines food production, biomass production for non-food applications (commodity outputs) with non-food functions (non-commodity outputs)
- Moyer and Josling (2002) call multifunctionality ‘a third model’ between the old protectionist model and the liberal competitive model
- MF is not a soft paradigm that states that we should keep subsidising non-competitive farms or only support diversification but is arguing for new ways to define efficiency and competitiveness
- Farmers should be performant in responding to all societal needs both with regard to food and non-food issues
- This creates new possibilities for value creation both at regional as at individual farm level



# Possible services by agriculture

## Green

- Landscape management
- biodiversity
- Animal welfare
- Wild fauna management
- Water management
- Flood control



## Bleu



## Red

- Bio-energy production
- Other energy forms
- bio-chemicals
- Rural cohesion
- Rural heritage
- regional identity
- tourism
- Green care services



## Yellow

## White

- Food safety
- Food security

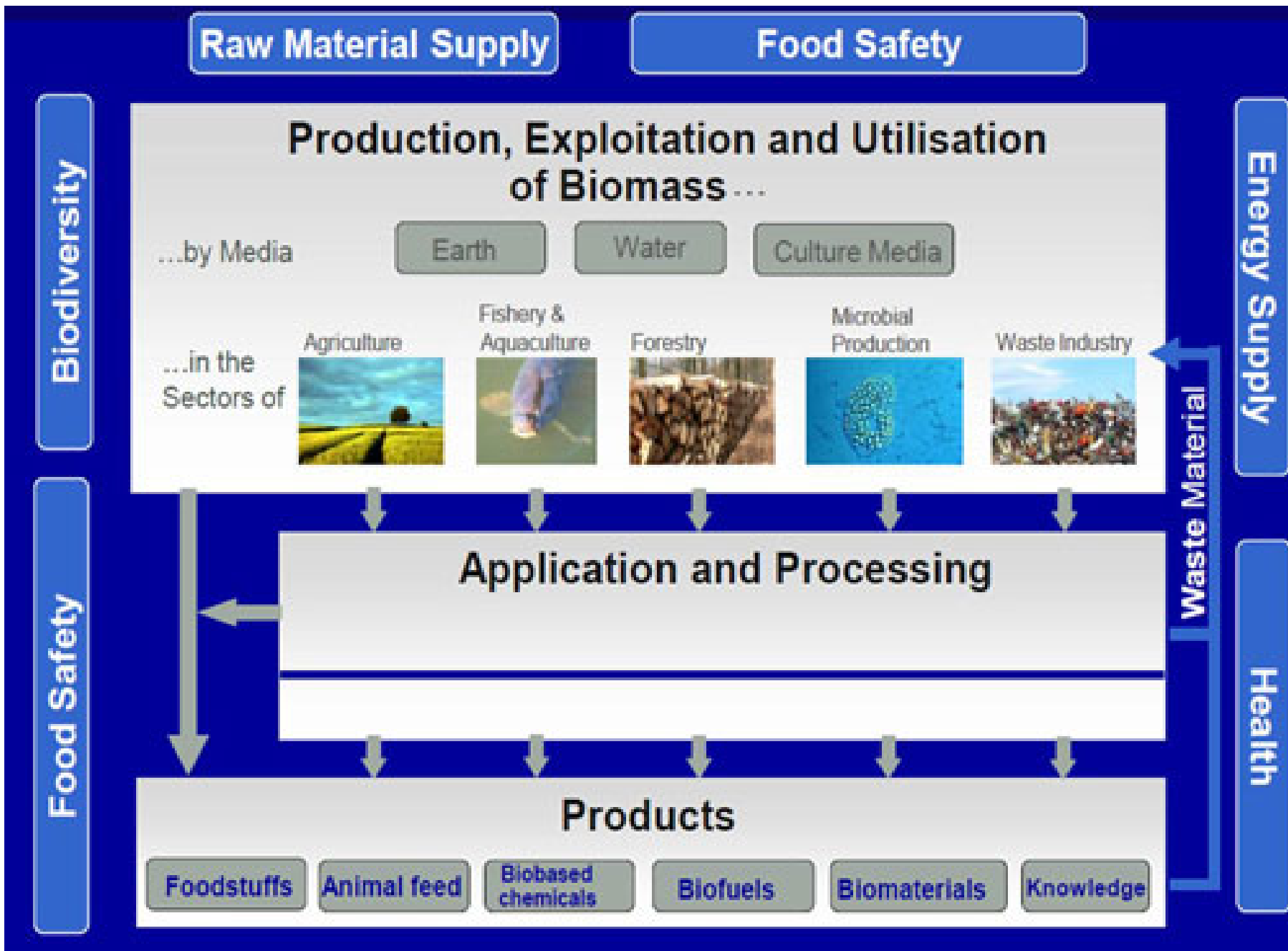


# MF agriculture fits in the transition towards a bio-based and green economy

Why: Fossil resources are non-renewable and exhaustible, thus not sustainable. They are affected by high price volatility and influence our economy and environment. Therefore there is a need to replace them

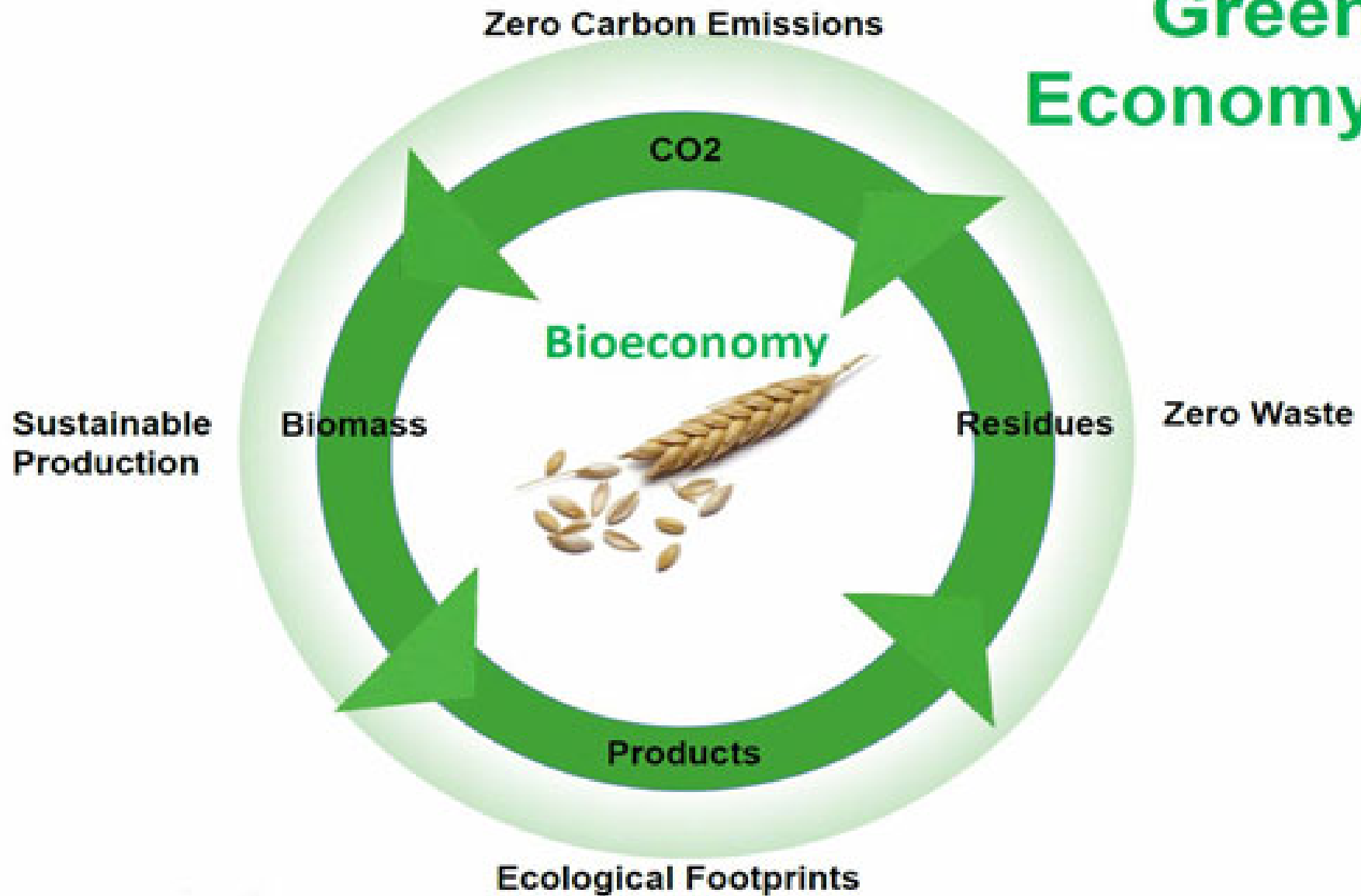
What: a bio-based economy is an economy in which the building blocks of materials, chemicals and energy are derived from renewable resources, thus mainly biomass and in which loops are closed (green economy) .

This will change and enlarge the role of agriculture in society: from provider of food towards provider of biomass, recycling sector for waste, provider of rural recreation, ....



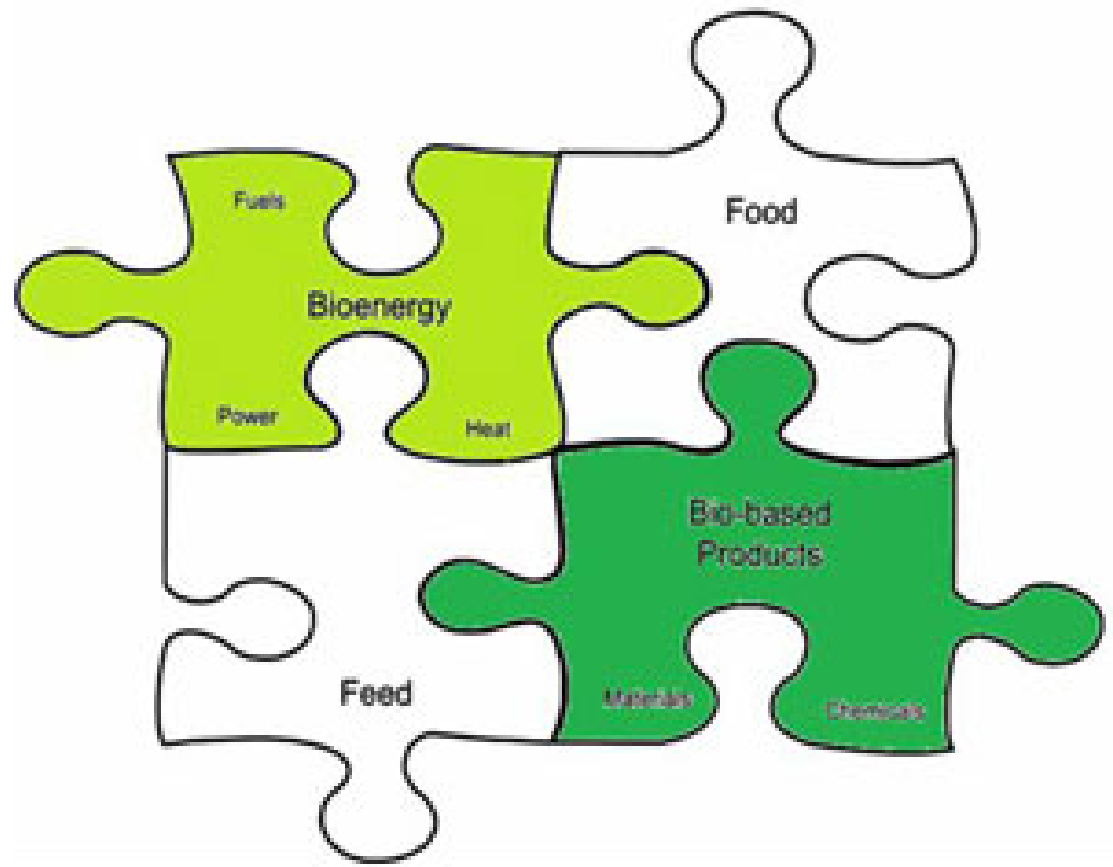
Bron: Von Braun, 2011 adapted from Bioeconomy Council, Germany, 2010

# Green Economy



# Biobased economy = Broadening the role of agriculture = multifunctionality

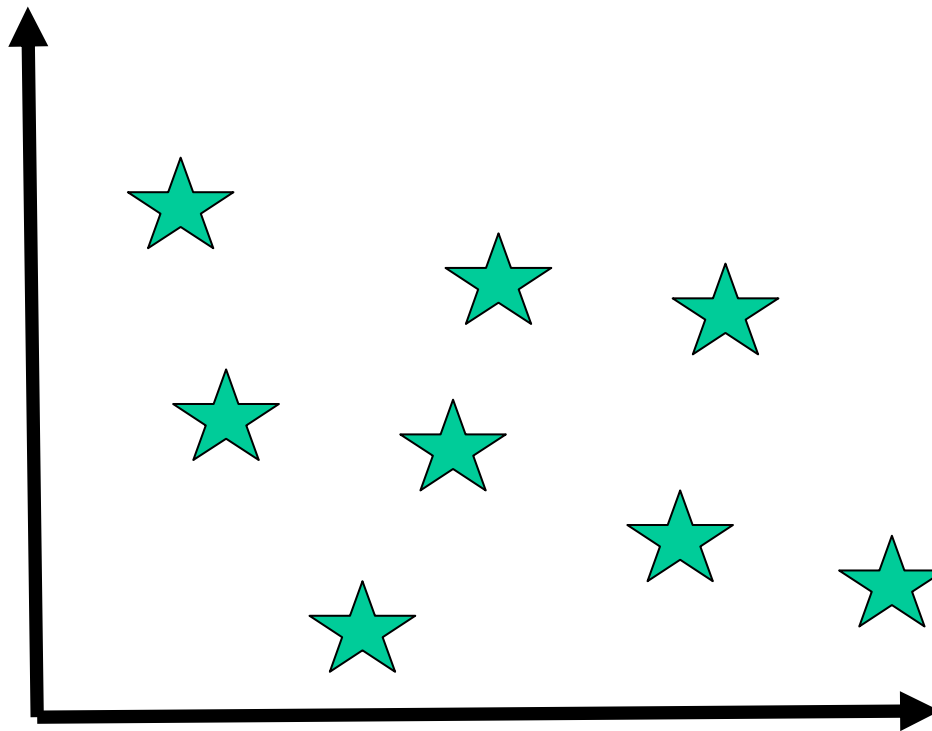
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## 4. New farm models

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VERTICAL, DEEPENING, CHAIN



LATERAL, BROADENING, DIVERSIFICATION

New types of rural companies:

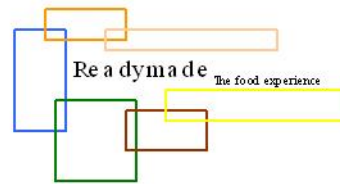
- chain companies
- partnerships

Source: visiontext of Flemish Policy Centre for Sustainable Agriculture

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# Option 1: chain companies

## 'Chain company'



- bundling of supply, production, processing and distribution
- farmers as franchise takers
- different establishments (others in NL, D, F)
- Sell to 'Crossroads' (retail group, food services, ...)

## 'Chain company'



- strong auto-control and traceability
- eco-efficiency and industrial ecology
- redistribution of value when necessary
- go beyond EU regulations, proactive, own R&D division (in joint venture with Food Solutions, a University spin-off)



# Smart innovation

## Genomics (better use of genes):

- ▶ Faster selection of varieties/races (biotech ?)
- ▶ Better control of diseases

## Precision agriculture (ICT use)

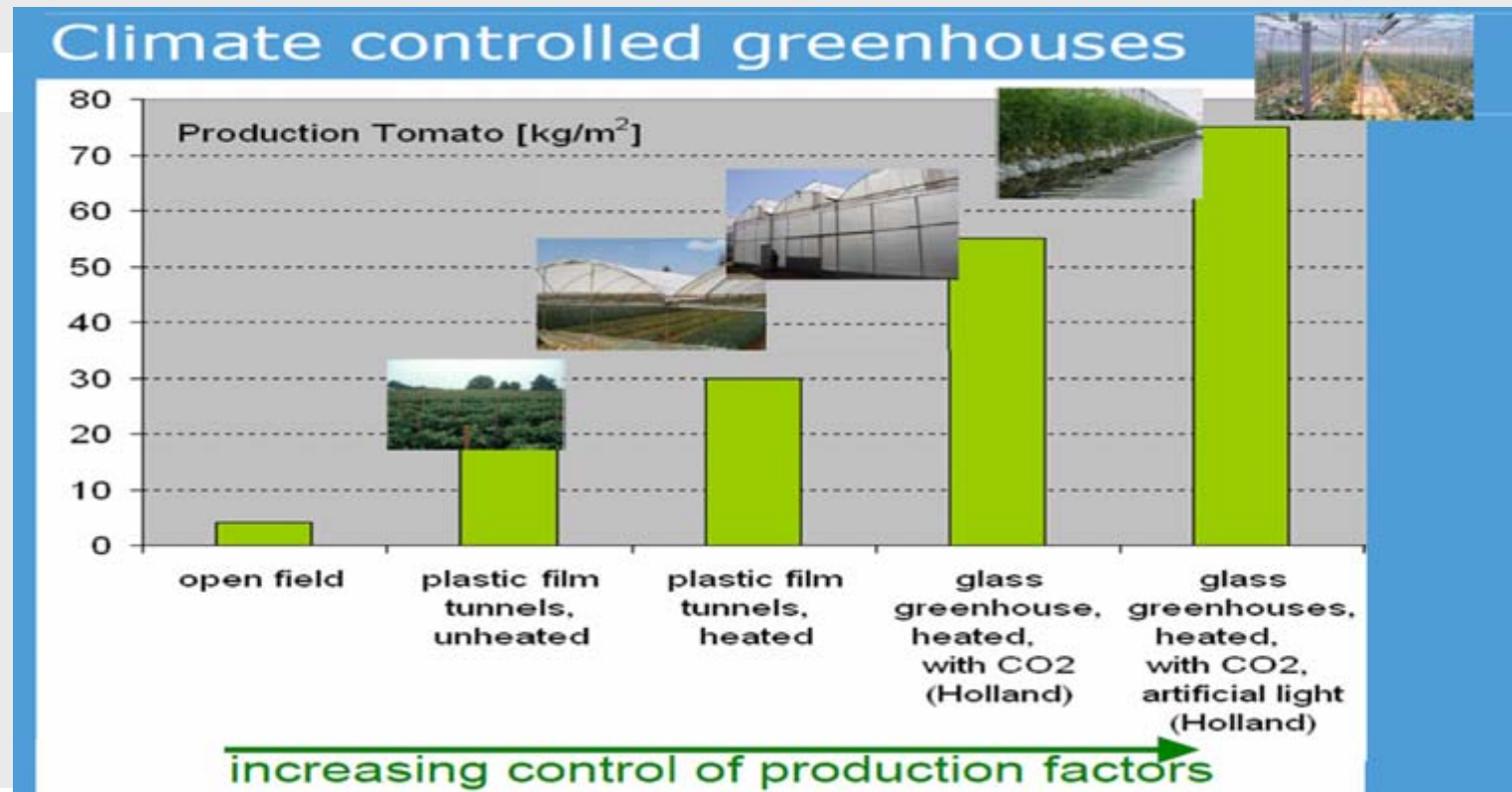
- ▶ More with less
- ▶ Use of agro-ecology

## Post-harvest techniques (max taste/min waste)

- ▶ Food technology
- ▶ Intelligent post-harvest techniques
- ▶ Bio-refinery (waste = byproduct)

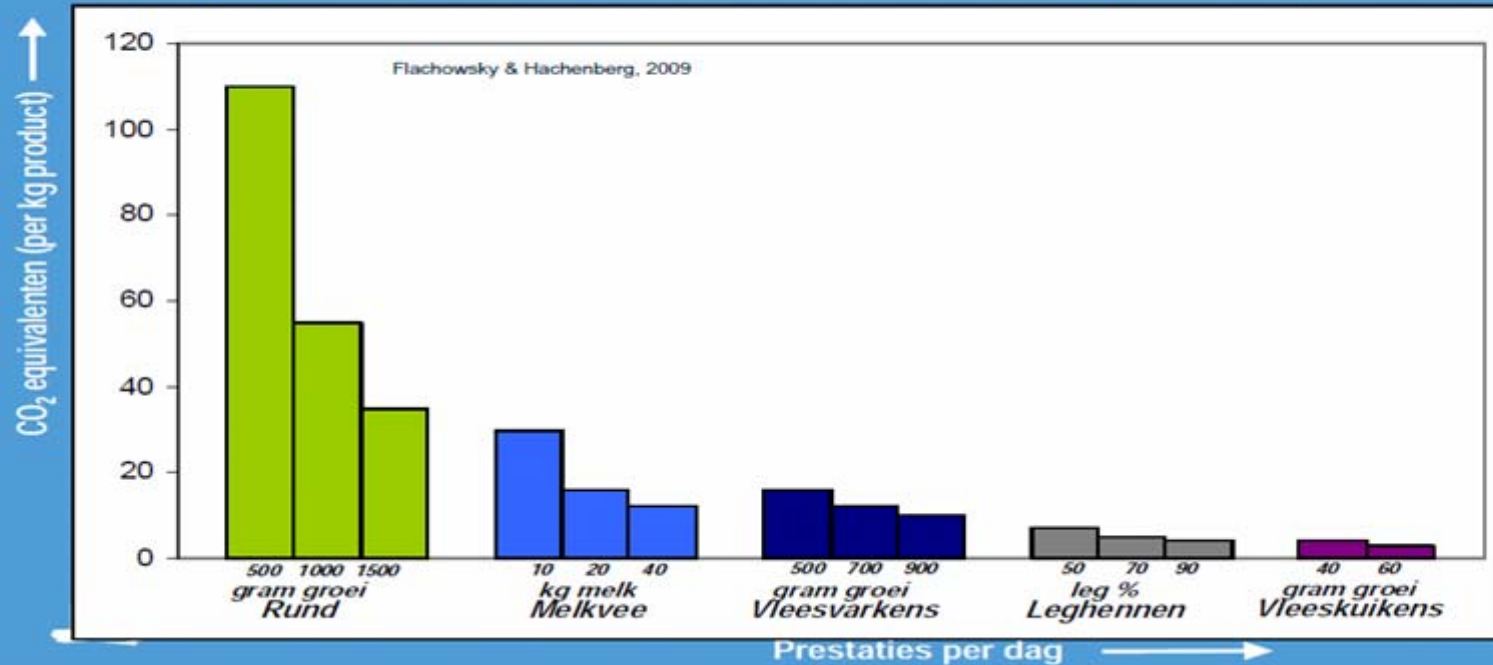


Smart intensification = increased control of production factors



# Smart intensification = less use of environment

Hoog productief doet het in dit opzicht beter



## New ways of creating value

### Past and present:

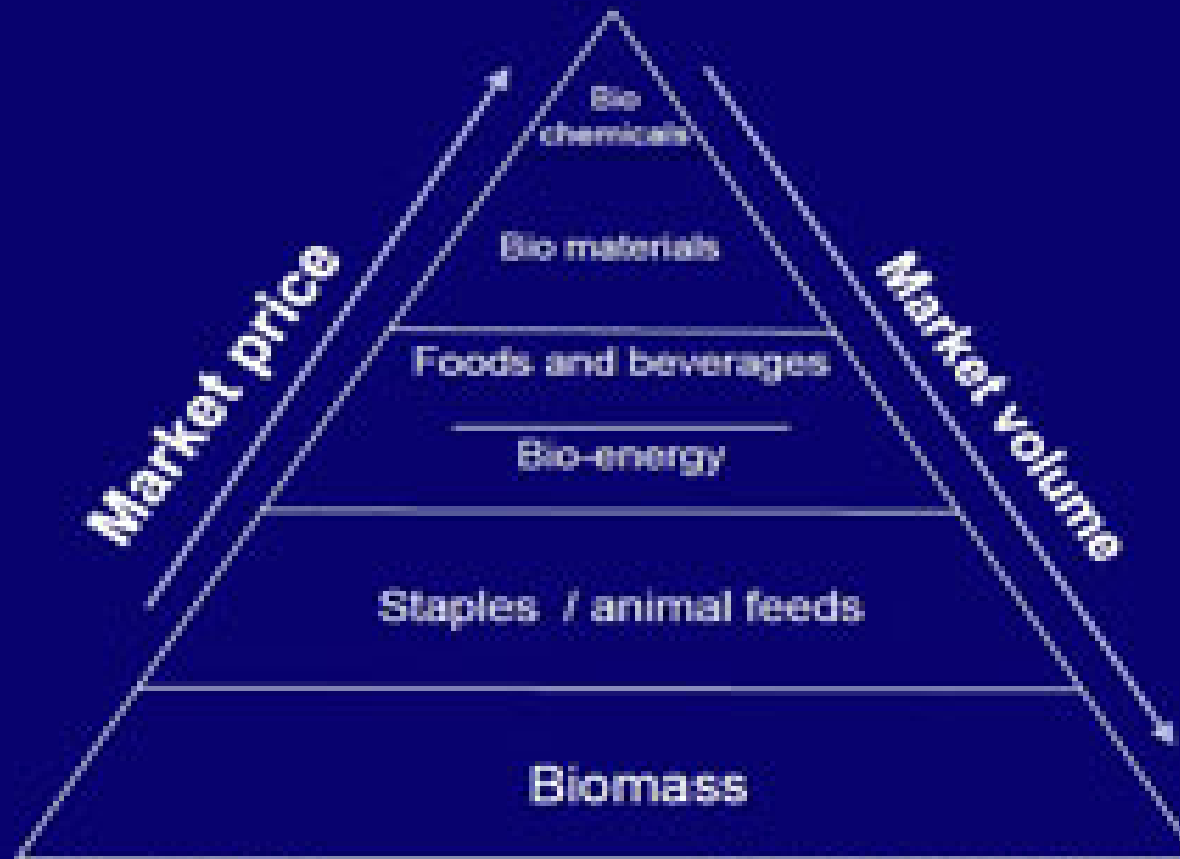
- Mass production
- Lowest price
- Consumer as threat
- Supply driven chains

### Future:

- Customized, flexible
  - Correct price
  - Consumer and retail as active actor in co-creation
  - Consumer-centered networks
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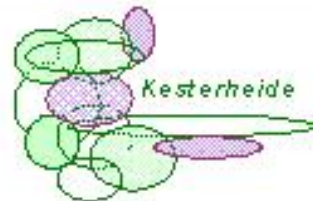
Chain companies = agriculture in the global value chain

## Pricing of biomass based products



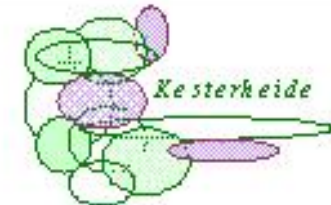
## Option 2: partnership farm

### 'Partnership'



- 7 farms, 1 society for nature conservation, 4 municipalities, 1 food team and 1 countryside team
- the whole is not a family firm
- Activities of the partners are complementary

### 'Partnership'



- Own products supplemented with those of neighbouring partnerships; with local identity
- Marketing via own channels (eg. farmers markets, food teams and central farm shop)
- Highly customized (eg. order by computer)
- Nature and landscape management, walking and cycling paths, water management
- income both from market as from society support mechanisms (agri-environmental payments, ...)

# New income opportunities for local farmers

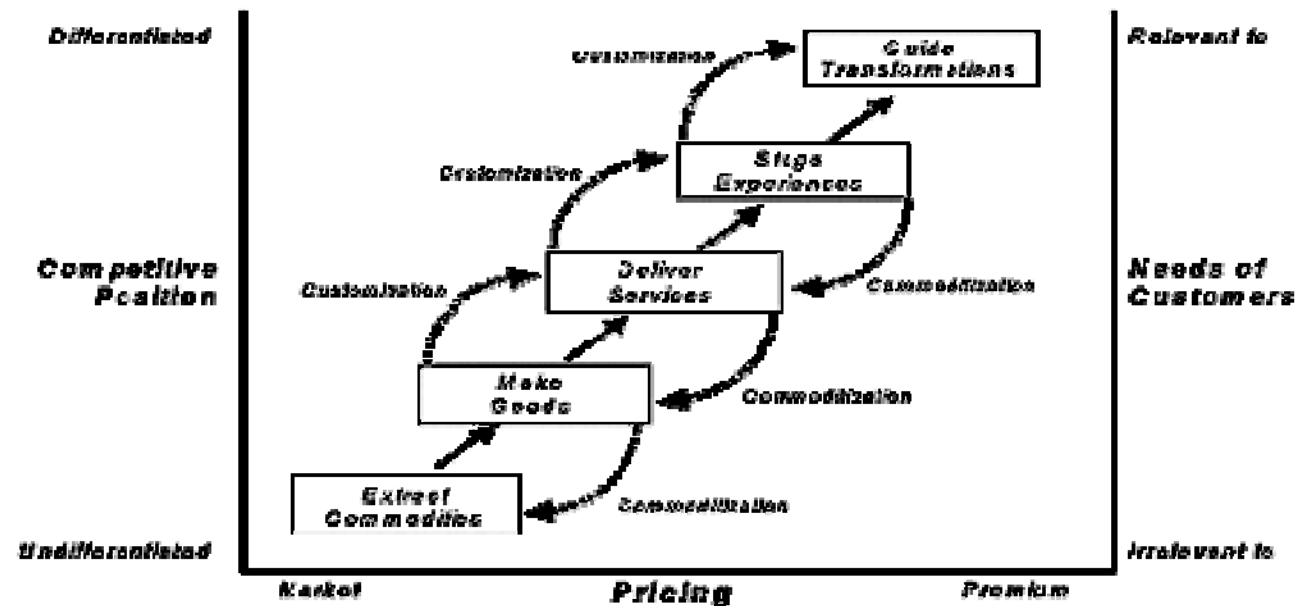


The LATTE concept:  
Local  
Authentic  
Trustworthy  
Traceable,  
Ethic



# LATTE concept and creating added value

## Completing the Progression of Economic Value





## 5. Conclusions

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## Closing the global and local innovation gap

- Both models will co-exist and have their place in the market
- Smart intensification by chain companies = leaving room for other uses of land ( = partnership companies)
- Smart intensification = reducing inputs and less pressure on environment
- Bio-based economy and MF agriculture require moving from individual strategies to network and system strategies involving the whole value chain and the whole portfolio of possible outputs of agriculture

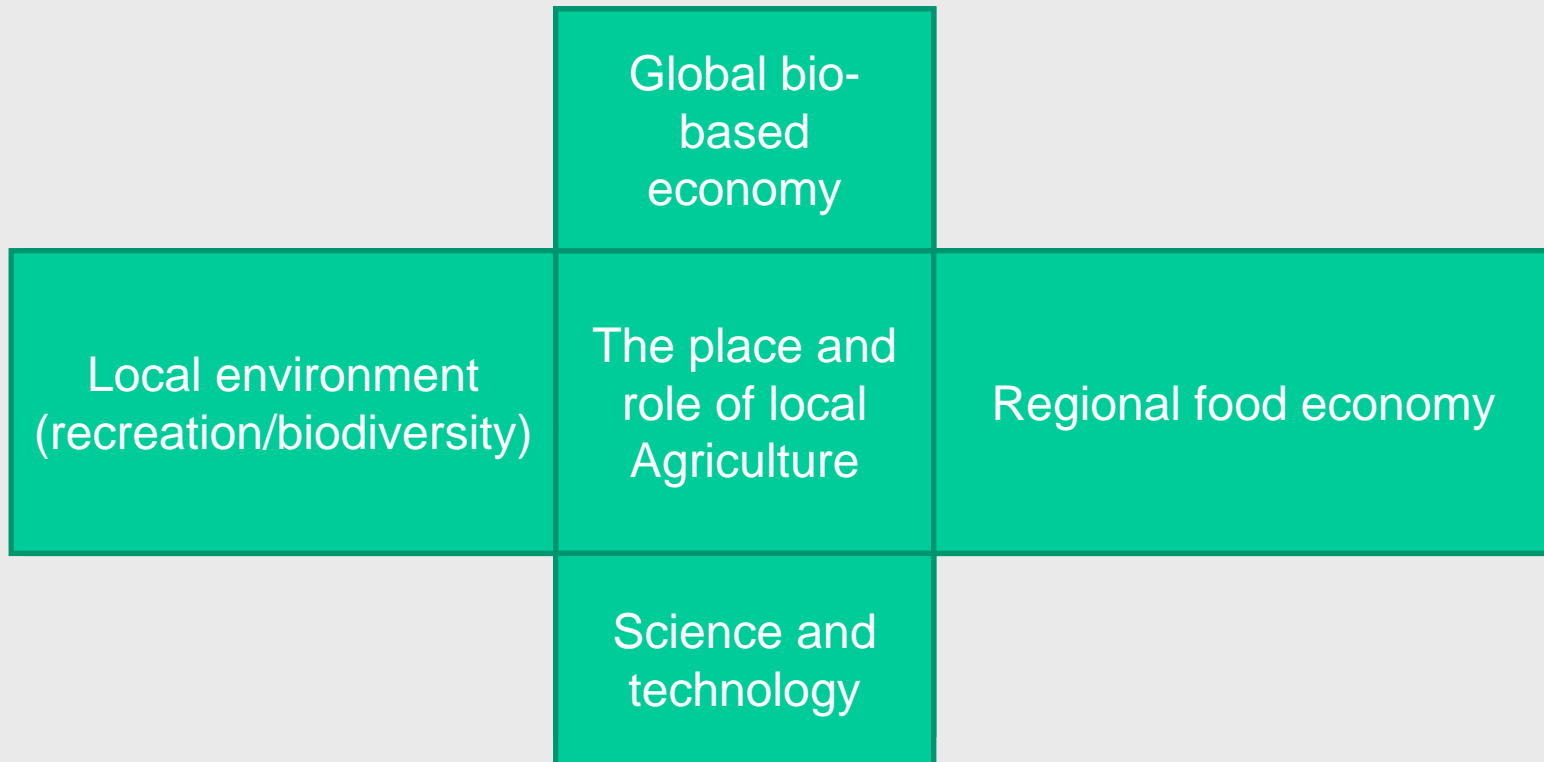
**Bio-based economy = a multifunctional agriculture integrated in the global economy**



# Requirements

- Scientific and technical innovation: increase in productivity and efficiency in all aspects of production and uses of resources
- Social innovation: mobilising stakeholders around a common project (agreements and conflicts) at regional level
- Institutional innovation: new ways of sharing added value in the global value chain
- Embedding agriculture in a regional economic strategy:
  - Rural – urban relations
  - Branding of regions and products
  - New financing mechanisms to pay for local public goods

Embedding agriculture in the global and local economy  
= thinking about vertical and horizontal linkages



Thank you for your attention

