

CHALLENGING LIFE SCIENCE UNIVERSITIES TO
DELIVER LEADERS FOR A GLOBAL WORLD:
IMPACT OF THE CHANGING ROLE OF FOOD,
AGRICULTURE AND RURAL AREAS

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CONTENT

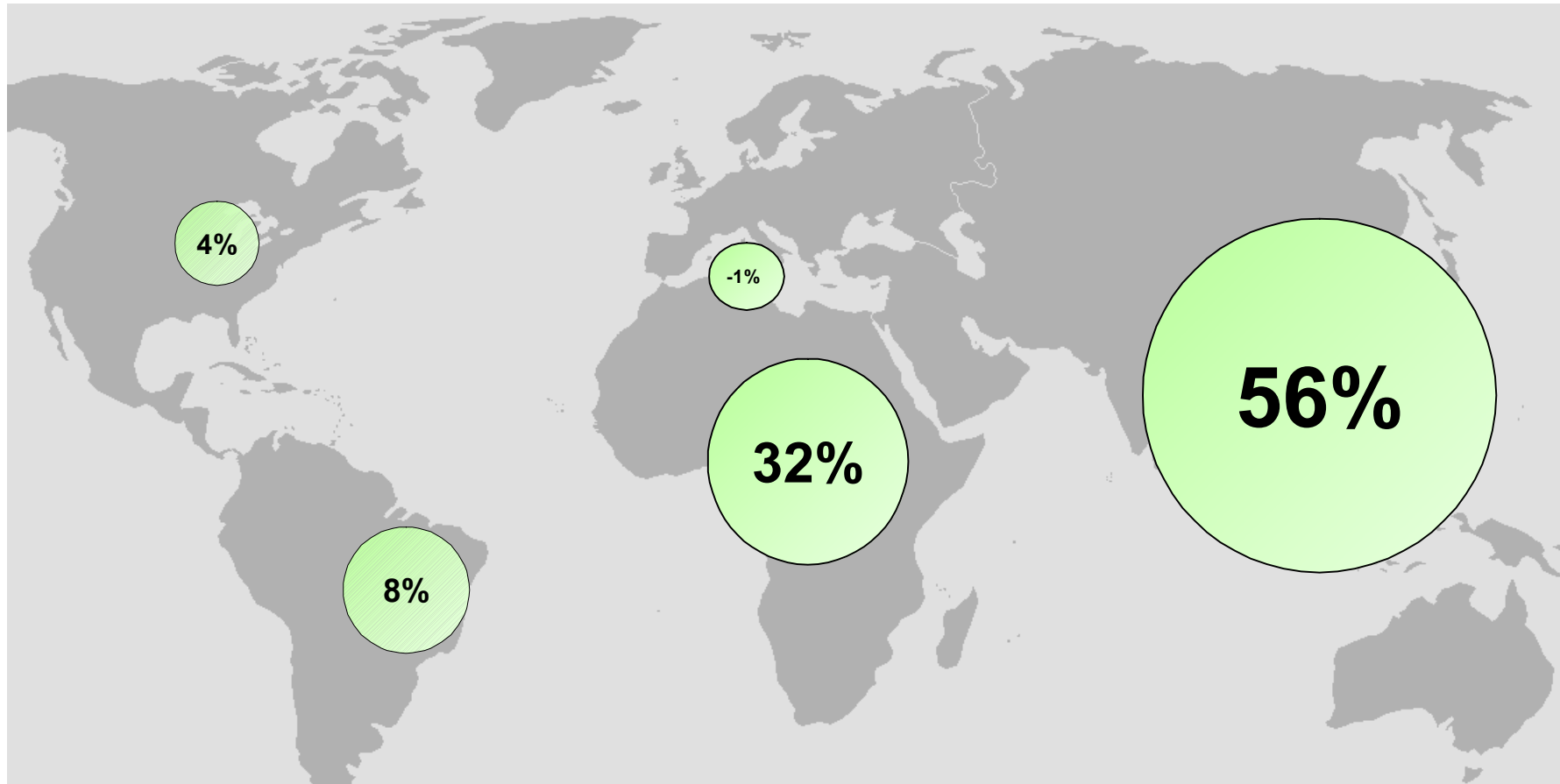
1. The global challenges for food, agriculture and rural areas
2. Impact for the role of agriculture
3. New business models in agriculture
4. Conclusions: what does this mean for life sciences education

1. THE GLOBAL CHALLENGES FOR FOOD, AGRICULTURE AND RURAL AREAS

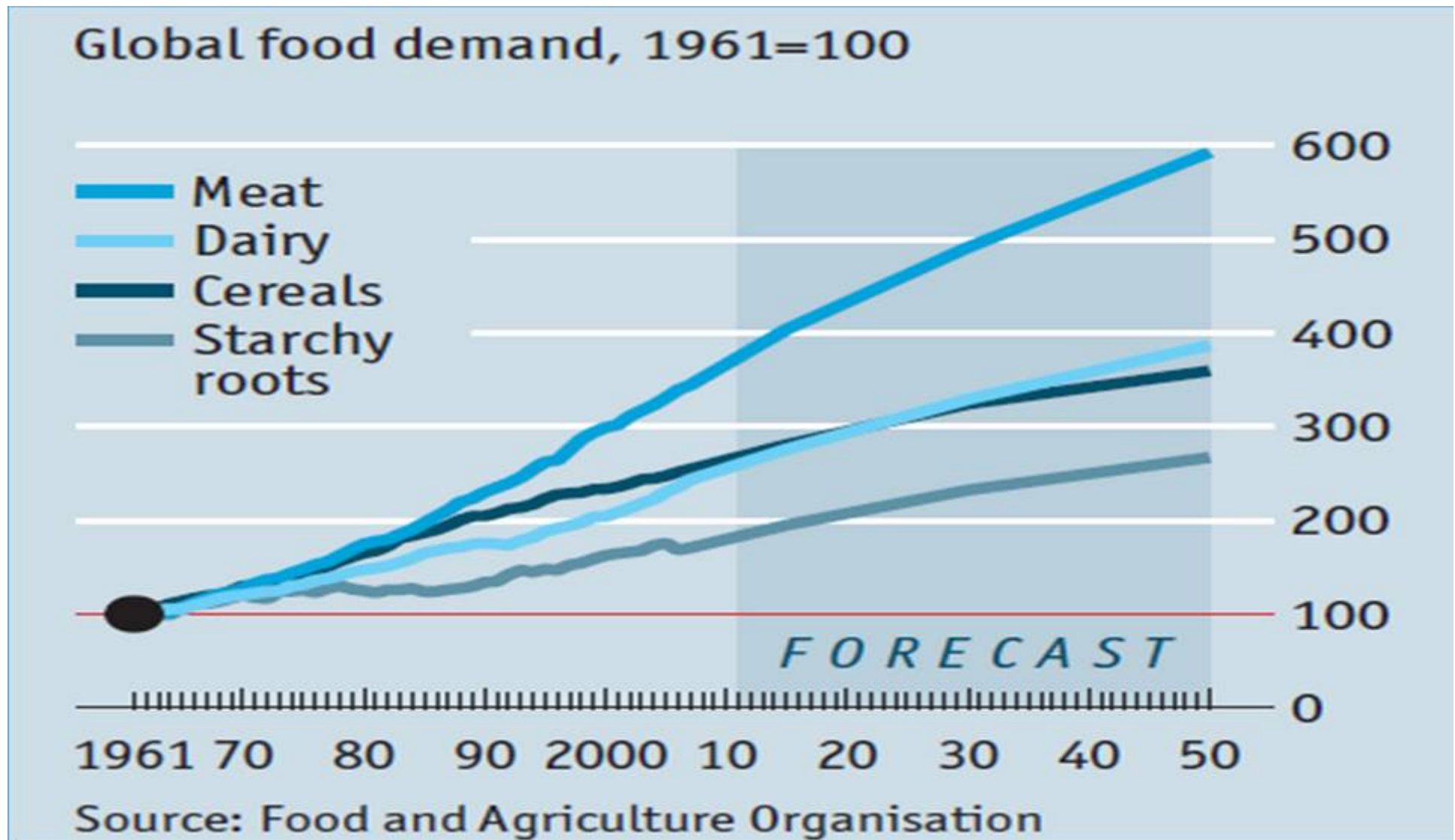
MAIN CHALLENGES

- Growing world population and migration
- Biodiversity decline and climate change
- Globalisation of markets
- Price volatility and speculation
- Concentration in the agro-industrial sector
- 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

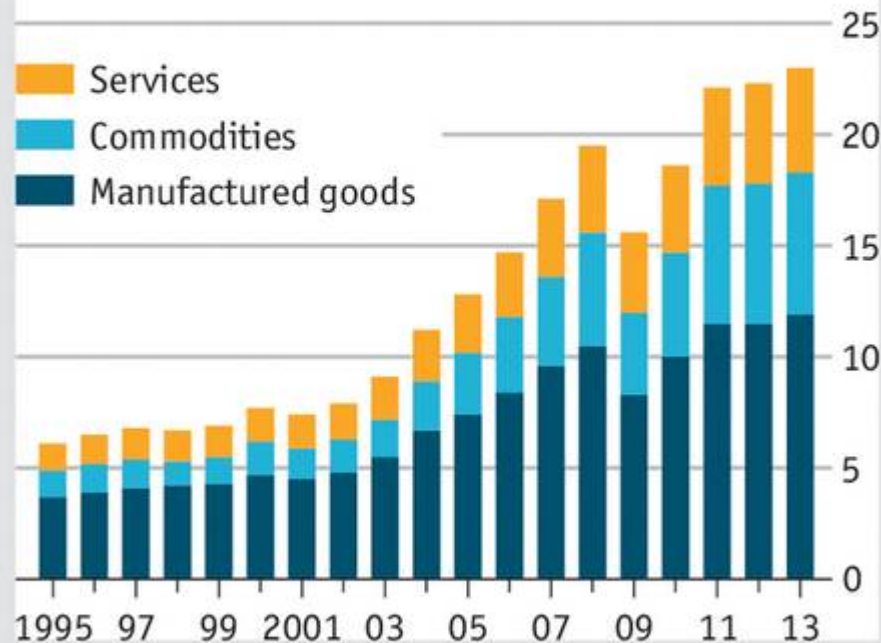
Climate change



TRADE GLOBALISATION

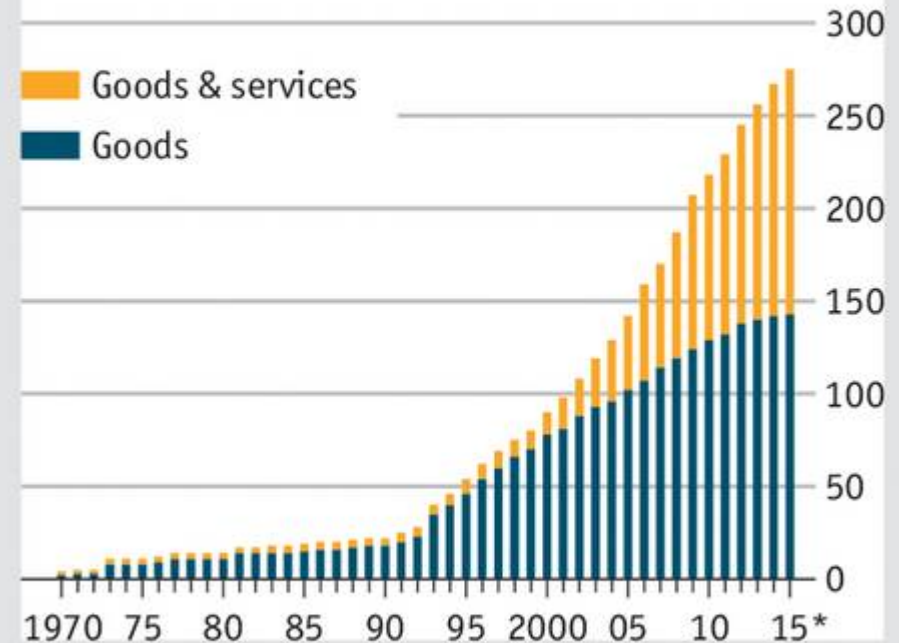
Global exports and trade agreements

Exports, \$trn



Sources: UNCTAD; WTO

Cumulative number of trade agreements

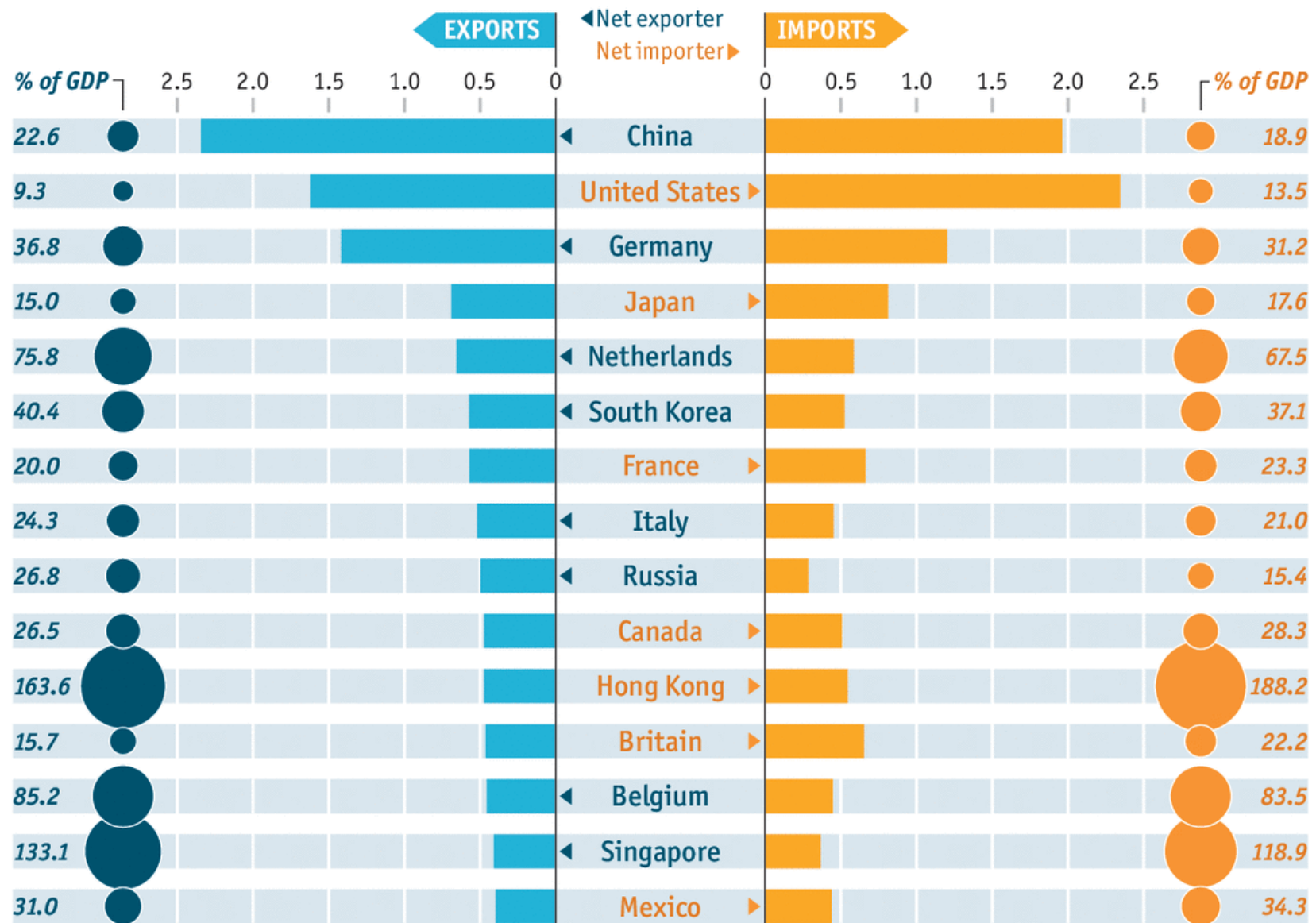


*To October 5th

Economist.com

Trade flows

Largest global exporters, 2014, \$trn



Source: IMF

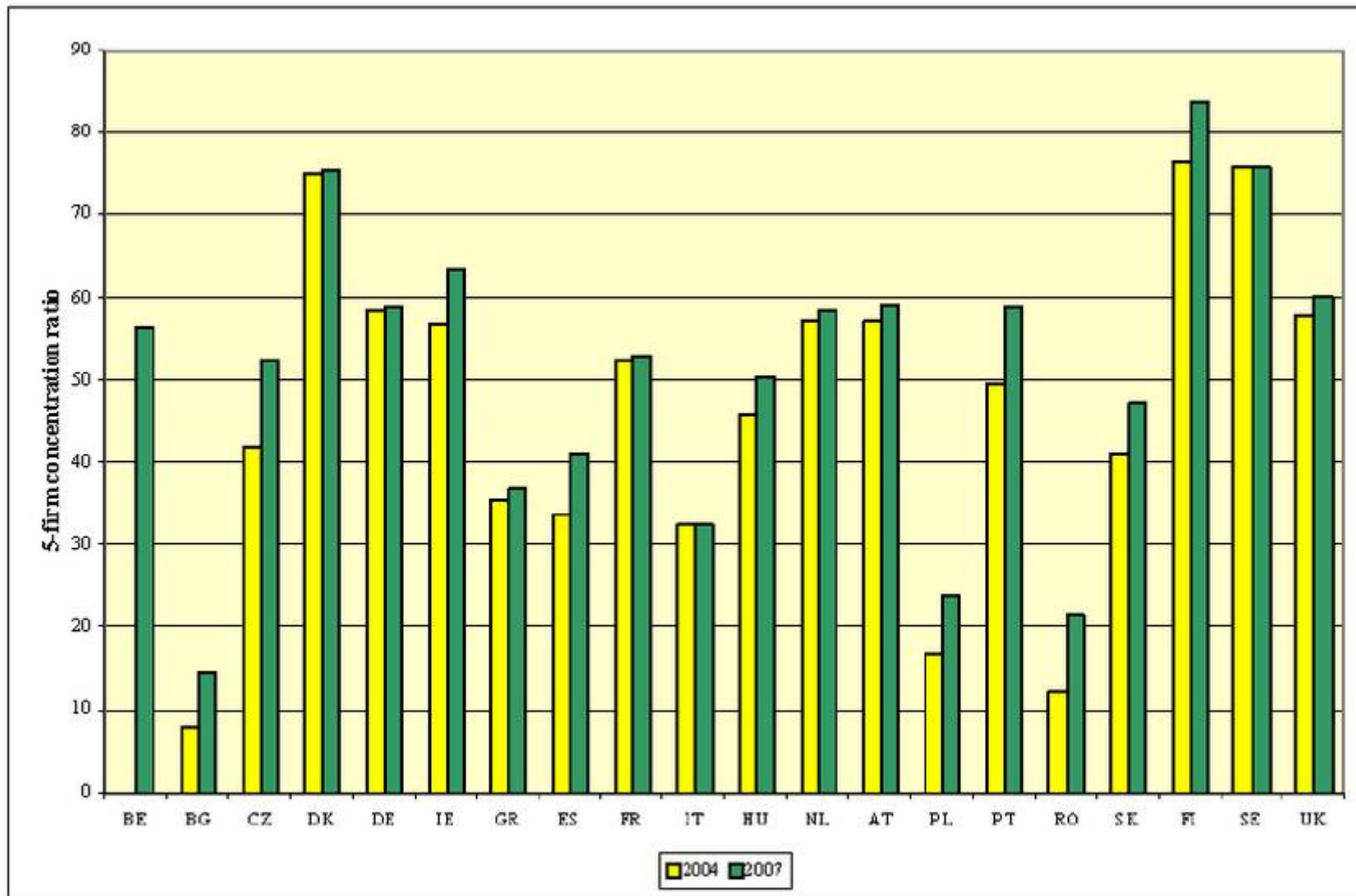
Economist.com

Protest against trade agreements

Problems to come to agreements: e.g. CETA



Concentration in the food sector (top 5 firm concentration ratio)



Also concentration at the input side:
e.g. agrochemicals, seed,



COMMODISATION OF FOOD



PRICE VOLATILITY AND SPECULATION

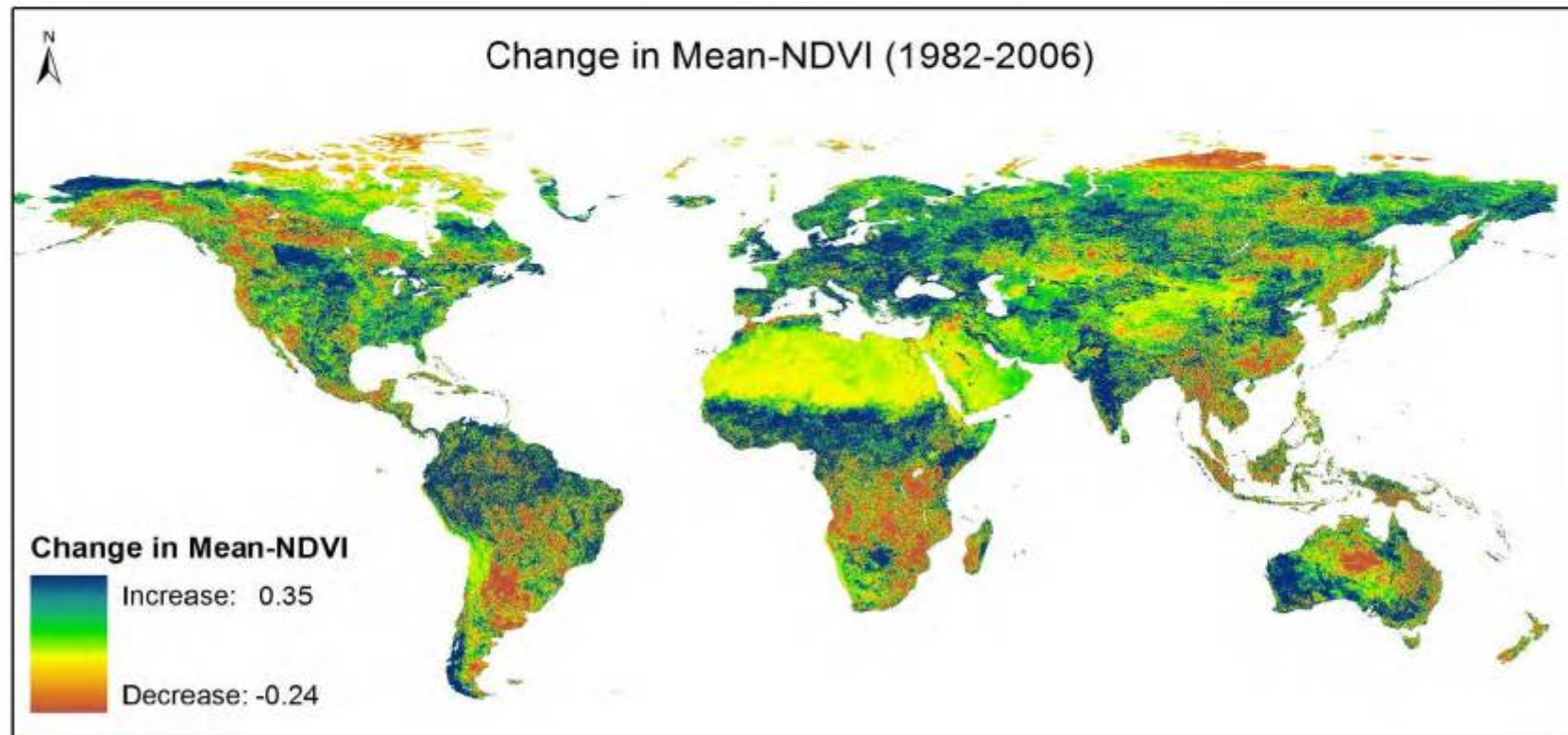


Land shortage and land degradation constrain production

Change in NDVI from 1982-2006

Baseline: 1982-1986

Endline: 2002-2006



42% of the poor live in degraded areas

Growing foreign land acquisitions: internationalization of land use markets



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

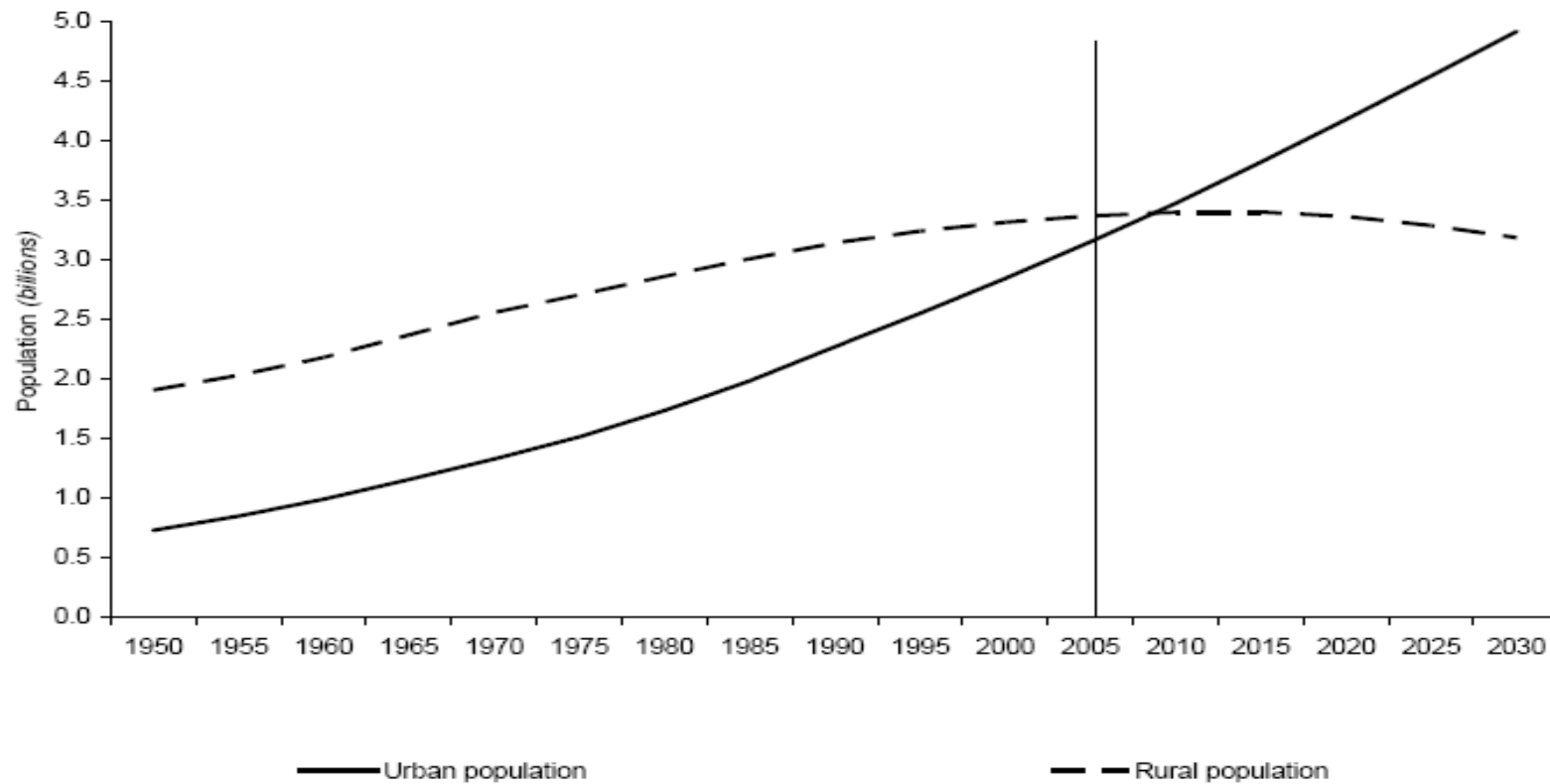
Other uses of biomass: feed versus fuel

Biofuel: ethanol growth (bln liters)

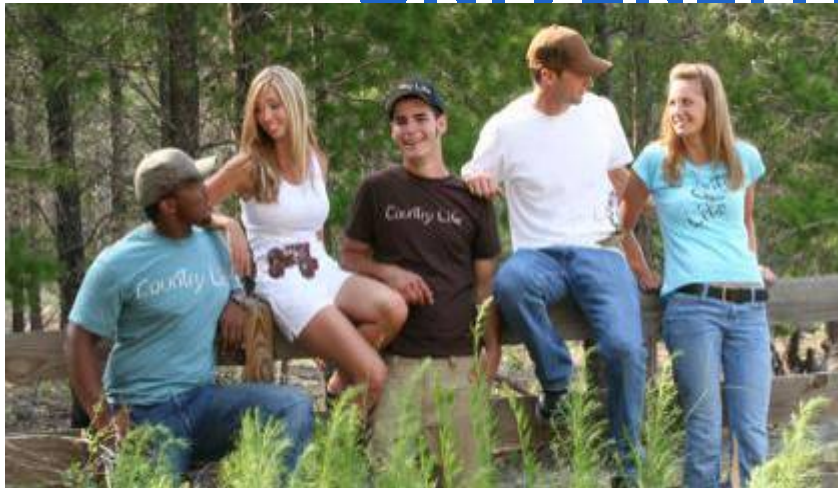
So far a bioeconomy with mixed blessings



WORLD WIDE TREND OF URBANISATION



THE DEMAND FOR SPACE AND PUBLIC GOODS AND SERVICES



MORE INTEREST IN LOCAL AND SPECIALFOOD

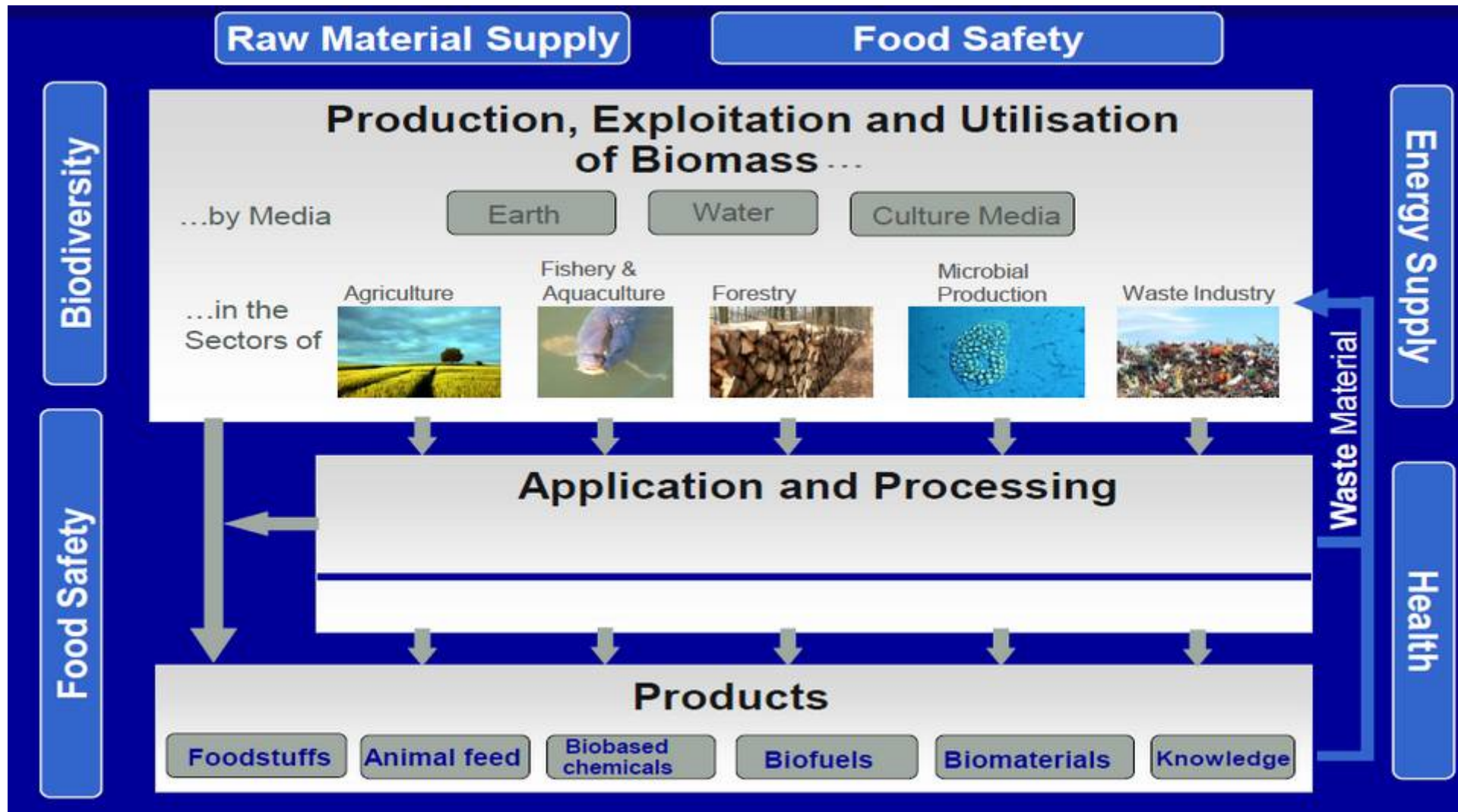


2. IMPACT FOR THE ROLE OF AGRICULTURE

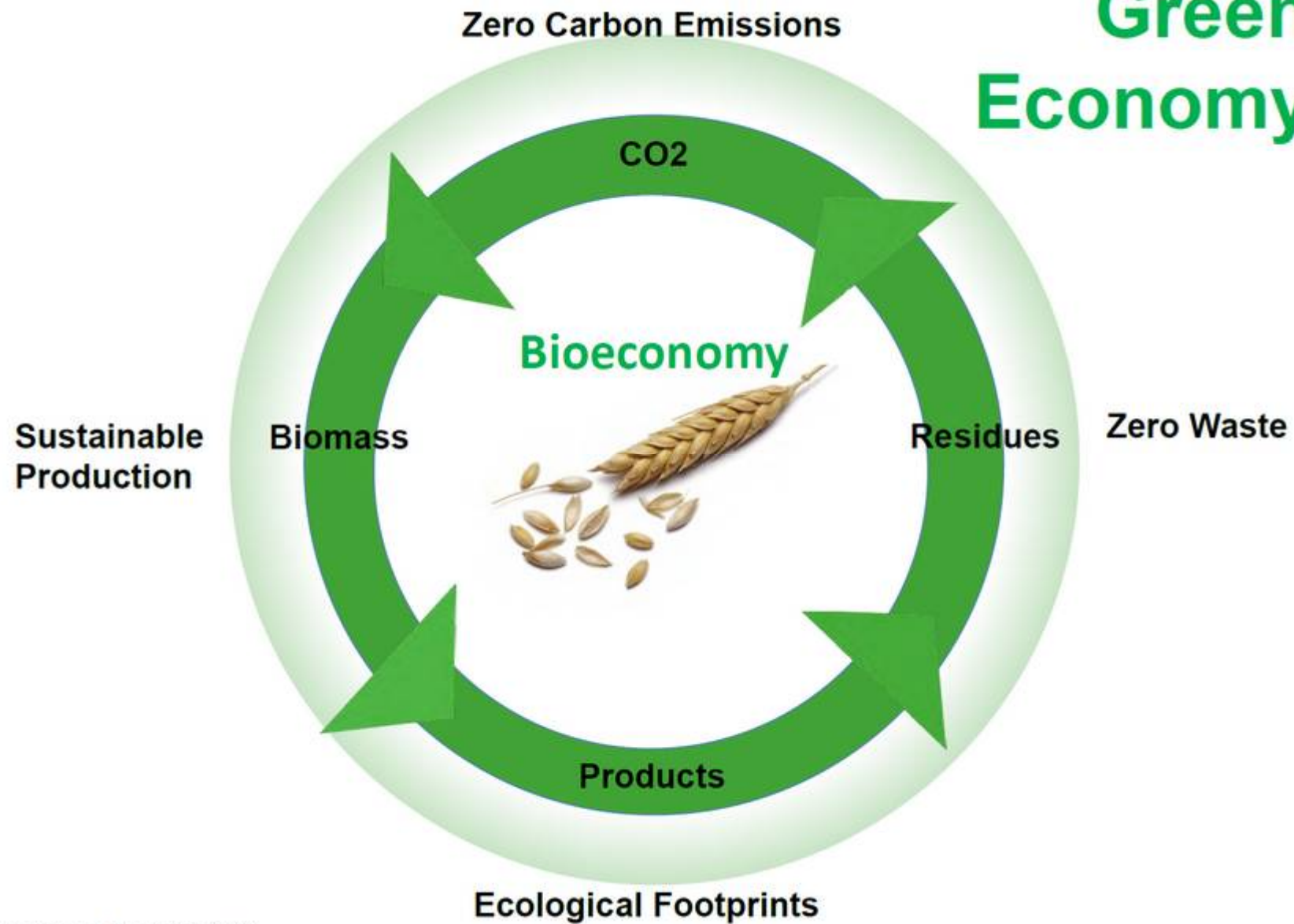
SUSTAINABLE DEVELOPMENT GOALS: NEW INTEREST IN ROLE OF FOOD, AGRICULTURE AND RURAL AREAS



AGRICULTURE AS PROVIDER OF BIOMASS

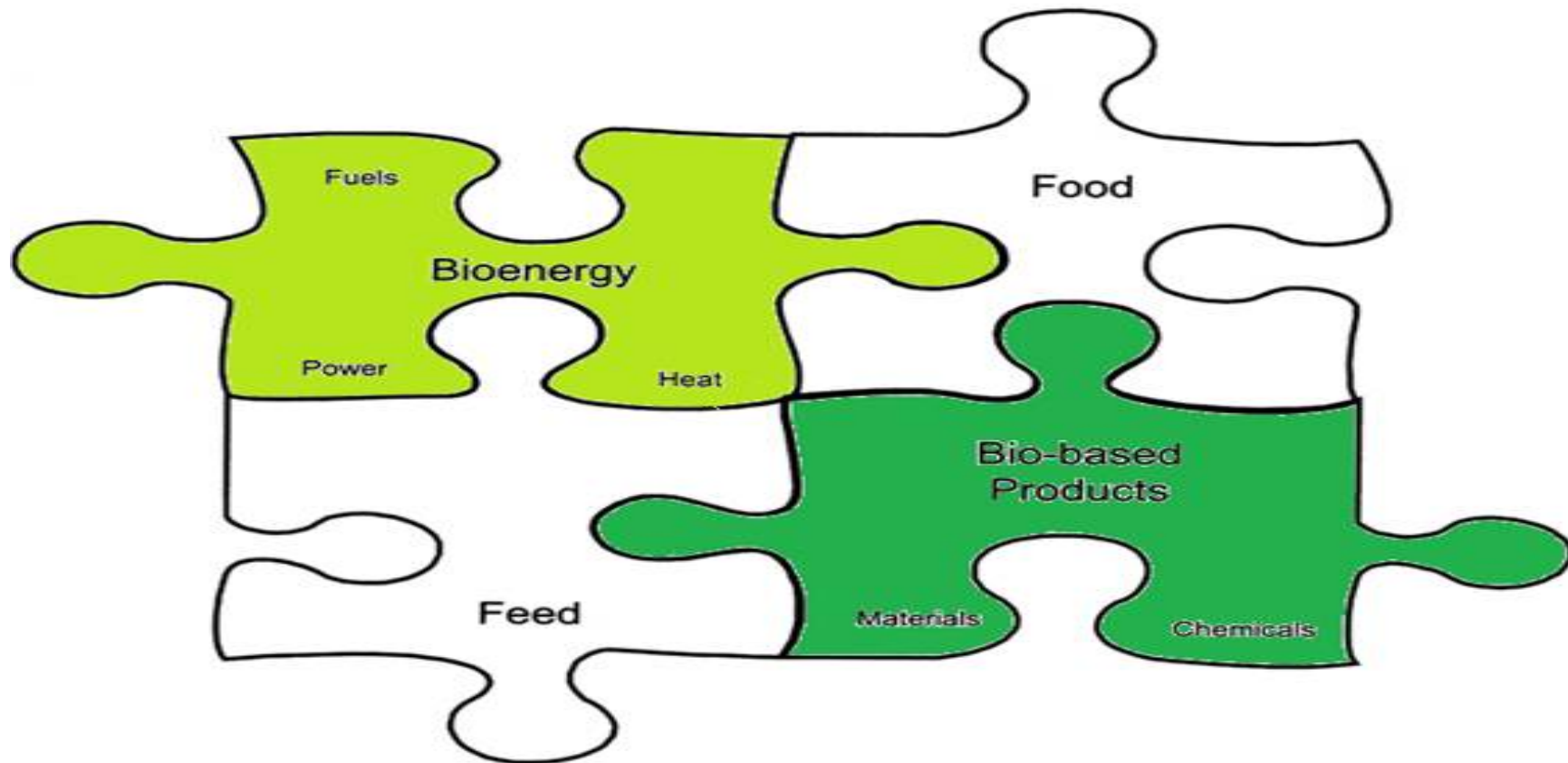


Green Economy



BIOBASED ECONOMY = BROADENING THE ROLE OF AGRICULTURE = MULTIFUNCTIONALITY

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NEW SERVICES BY AGRICULTURE AND RURAL AREAS

Green

- Landscape management
- biodiversity
- Animal welfare
- Wild fauna management

Bleu

- Water management
- Flood control

Red

- Bio-energy production
- Other energy forms
- bio-chemicals

Yellow

- Rural cohesion
- Rural heritage
- regional identity
- tourism
- Green care services

White

- Food safety
- Food security

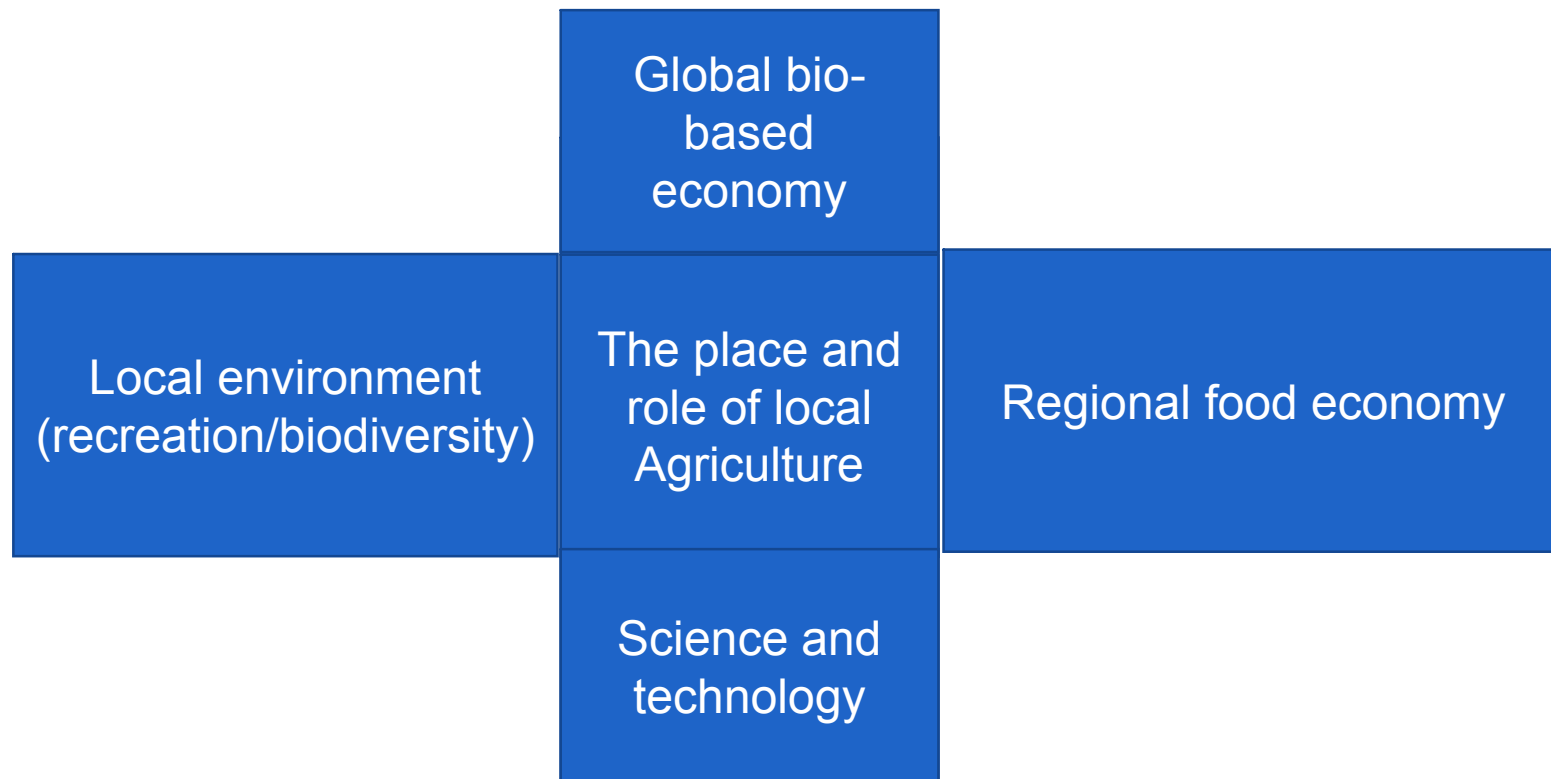


UNIVERSITEIT
GENT



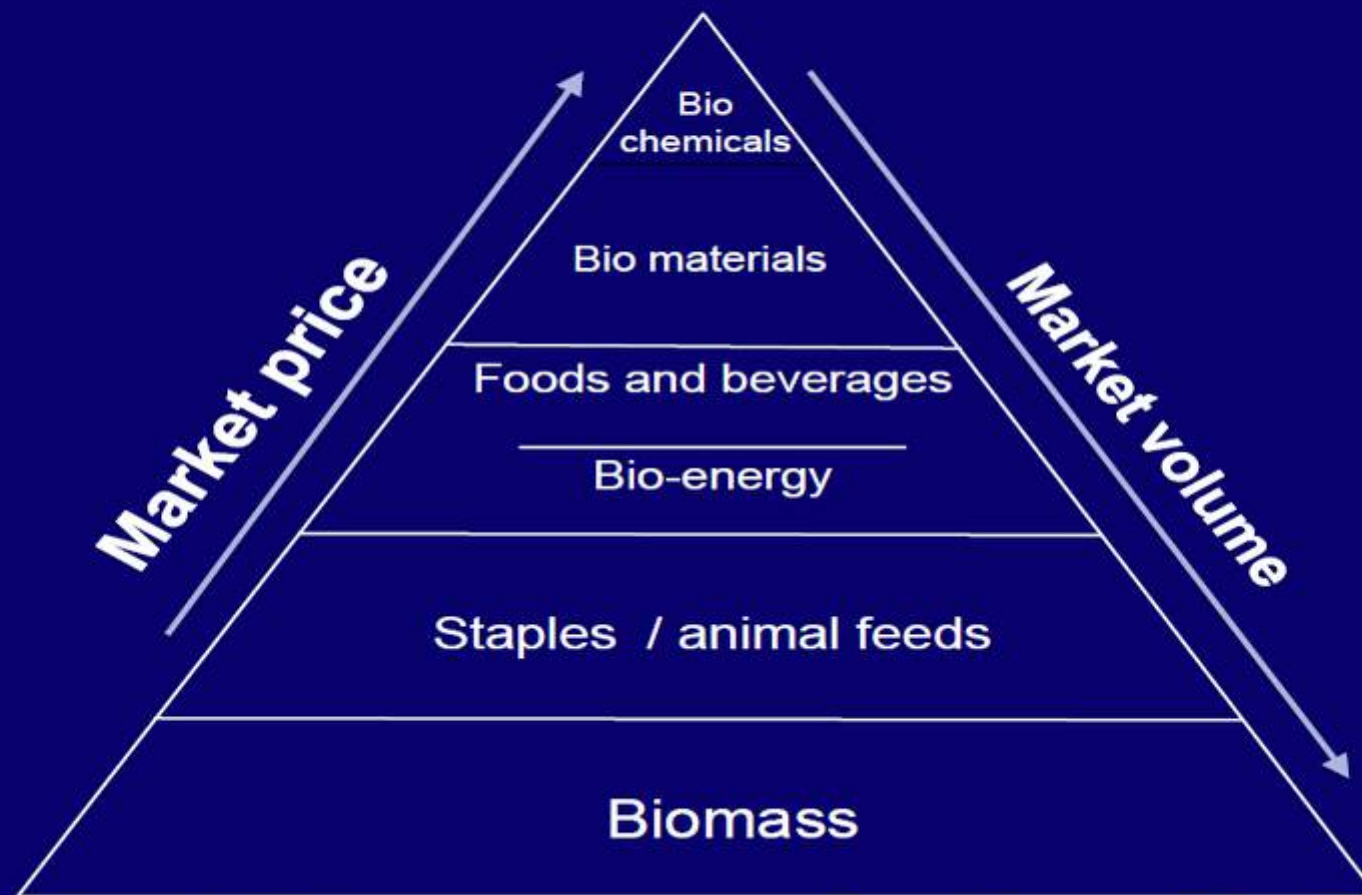
3. NEW BUSINESS MODELS IN AGRICULTURE

RETHINKING ROLE OF AGRICULTURE = THINKING ABOUT VERTICAL AND HORIZONTAL LINKAGES



BUT ALSO ABOUT AGRICULTURE IN THE GLOBAL VALUE CHAIN

Pricing of biomass based products



AND MAKING LINKAGES BETWEEN SECTORS





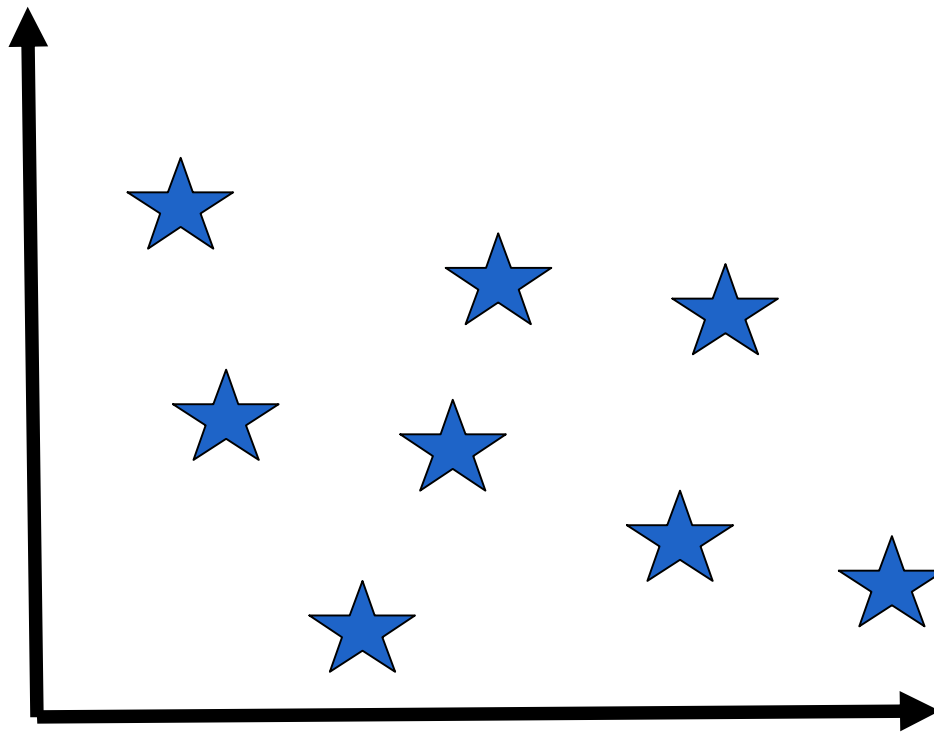
Biobased Industries PPP



Biobased Industries PPP

DEVELOPING NEW BUSINESS MODELS

VERTICAL, DEEPENING, CHAIN



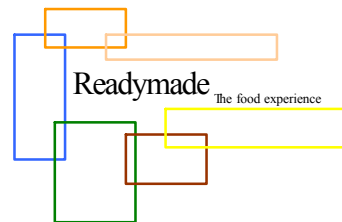
New types of rural companies:

- chain companies
- partnerships

Source: visiontext of Flemish Policy Centre for Sustainable Agriculture

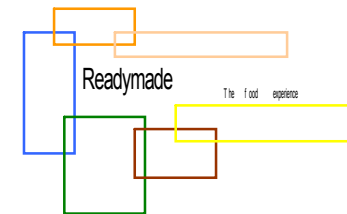
OPTION 1: CHAIN COMPANIES

'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, ...)

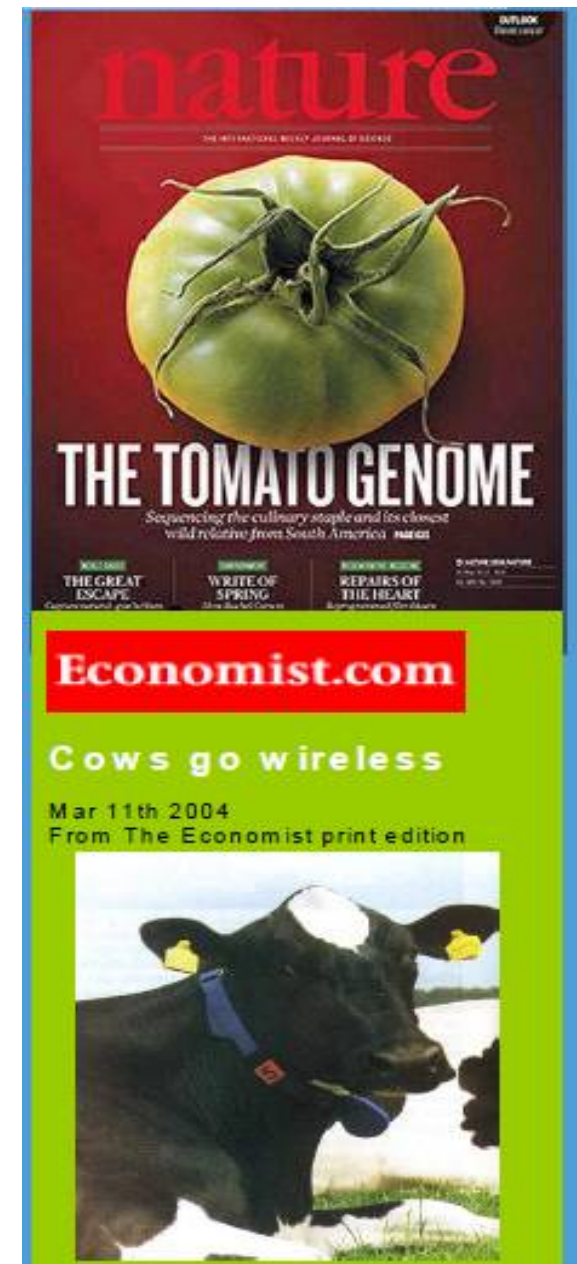
'Chain company'



- 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)



SUSTAINABLE INTENSIFICATION

**Optimalisation
input/production
unit**

Land

Water

Energy

Nutrients and feed

Crop protection

Animal welfare



**Respect for
ecosystems**

soil

Water

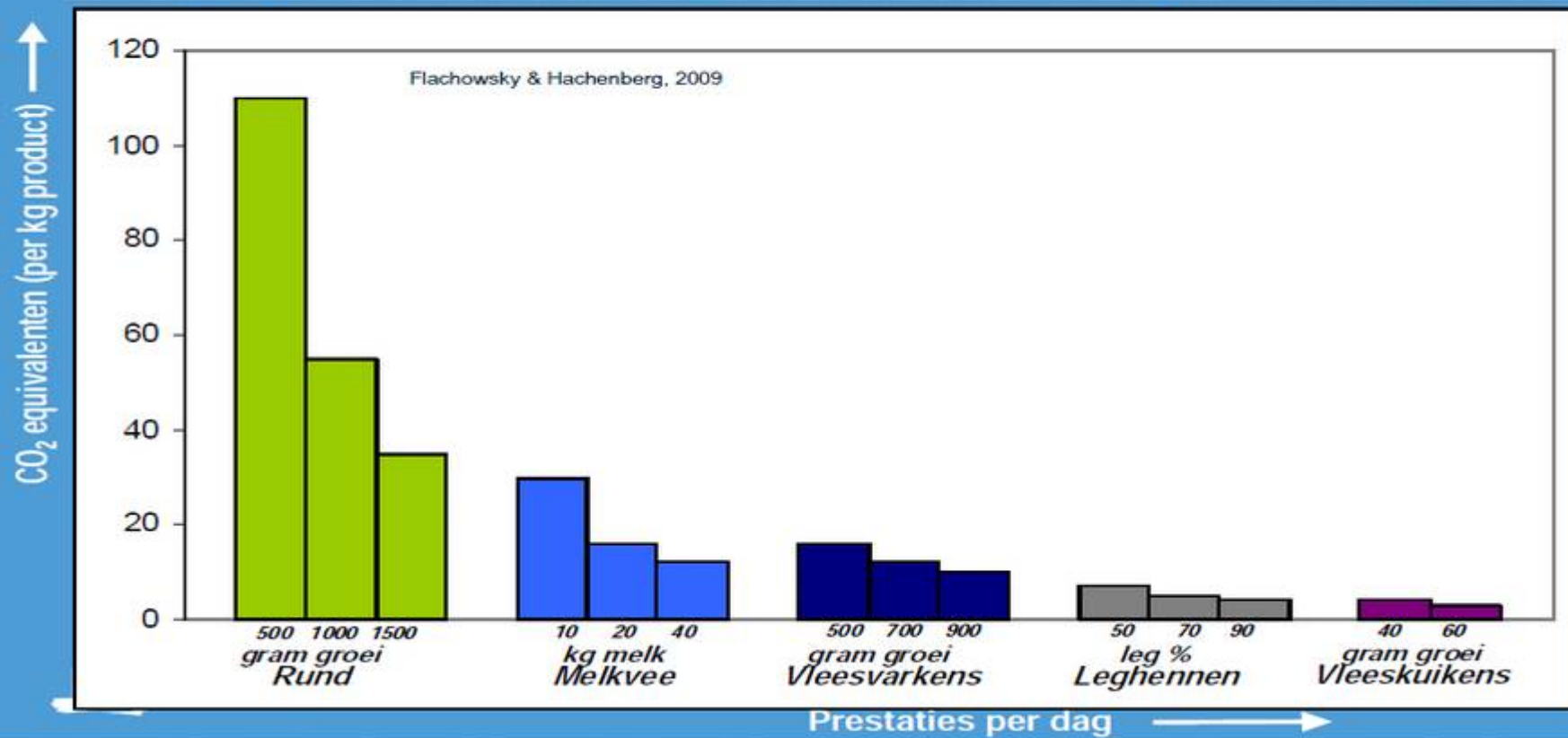
air

Biodiversity

Landscape

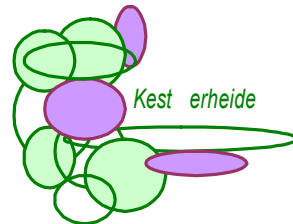
SUSTAINABLE INTENSIFICATION = LESS USE OF ENVIRONMENT

Hoog productief doet het in dit opzicht beter



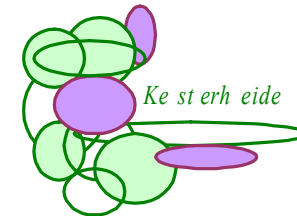
OPTION 2: PARTNERSHIP FARM

'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 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

NEW INCOME OPPORTUNITIES FOR LOCAL FARMERS

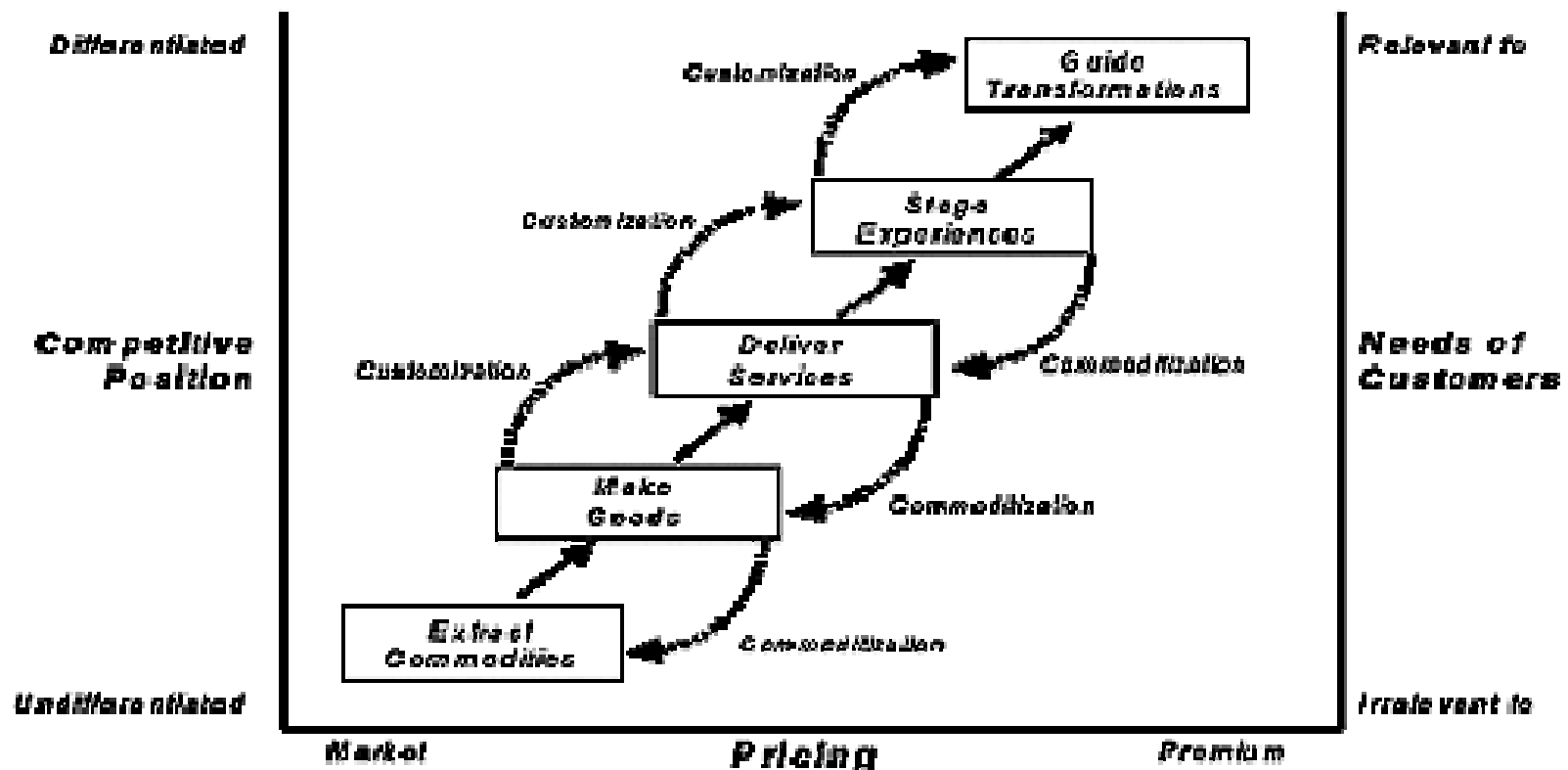


The LATTE concept:
Local
Authentic
Trustworthy
Traceable,
Ethic



LATTE CONCEPT AND CREATING ADDED VALUE

Completing the Progression of Economic Value

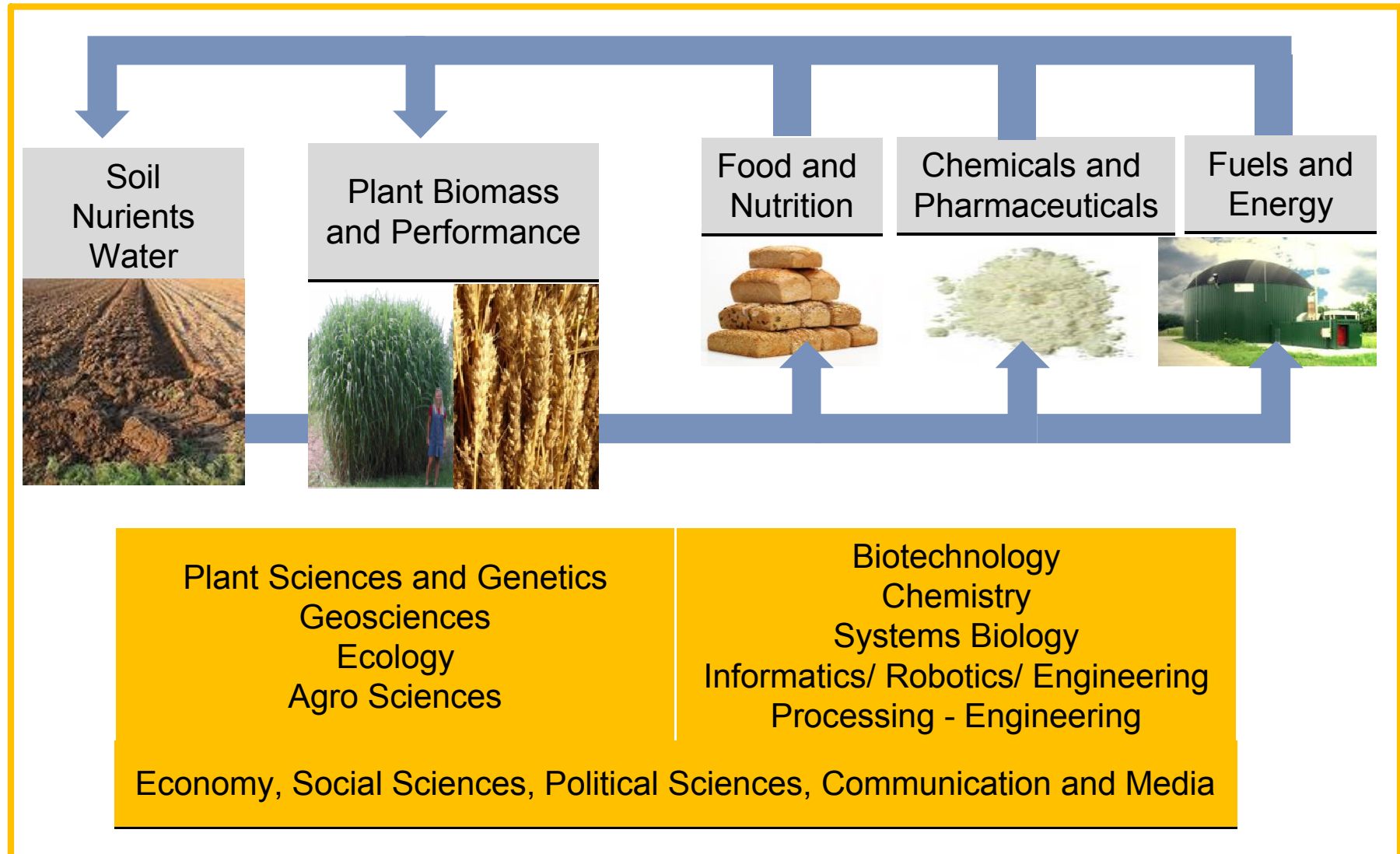


4. CONCLUSIONS: WHAT DOES THIS MEAN FOR EDUCATION

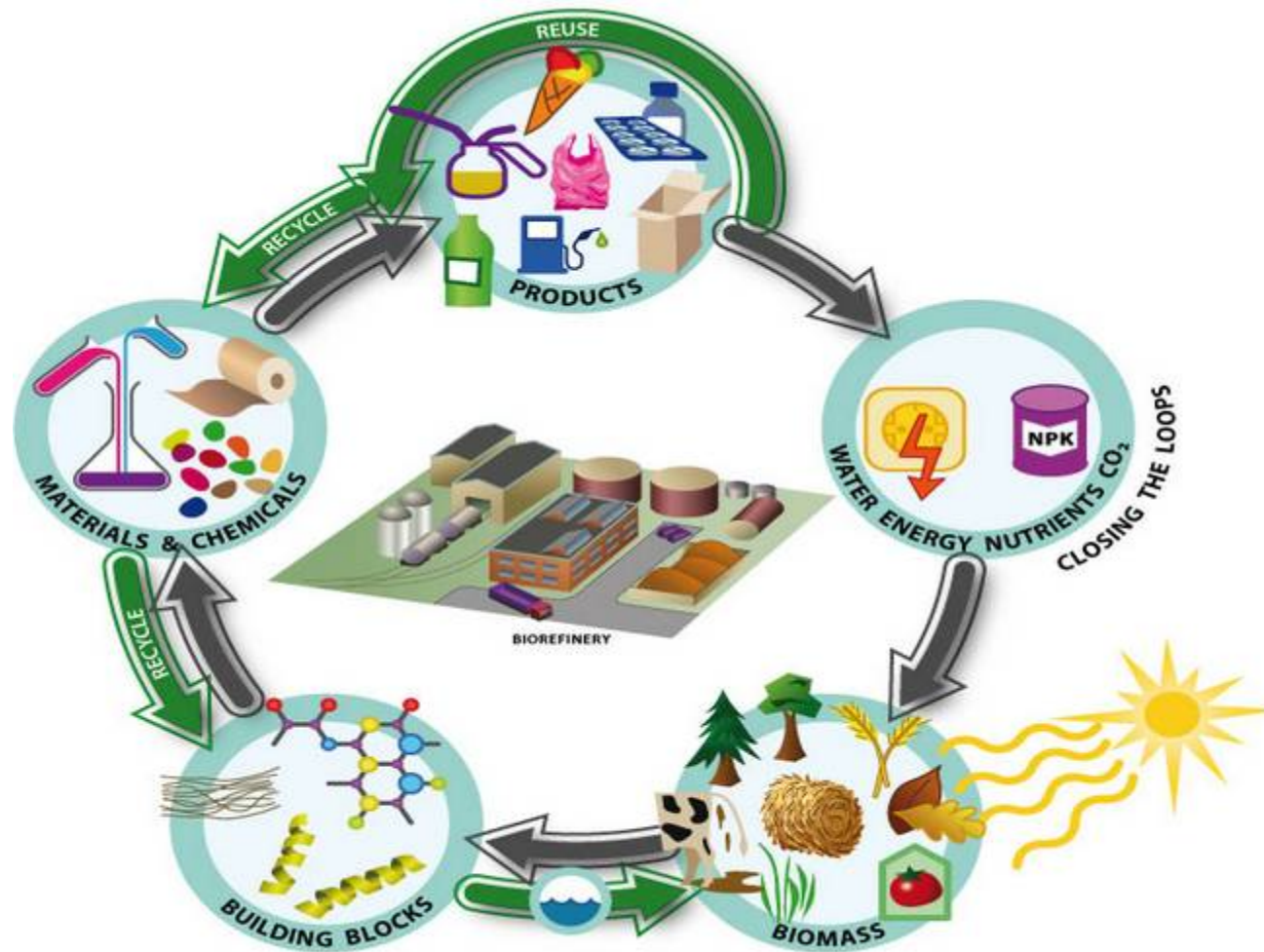
REQUIREMENTS FOR THE GREEN TRANSITION

- 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 international, national and 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

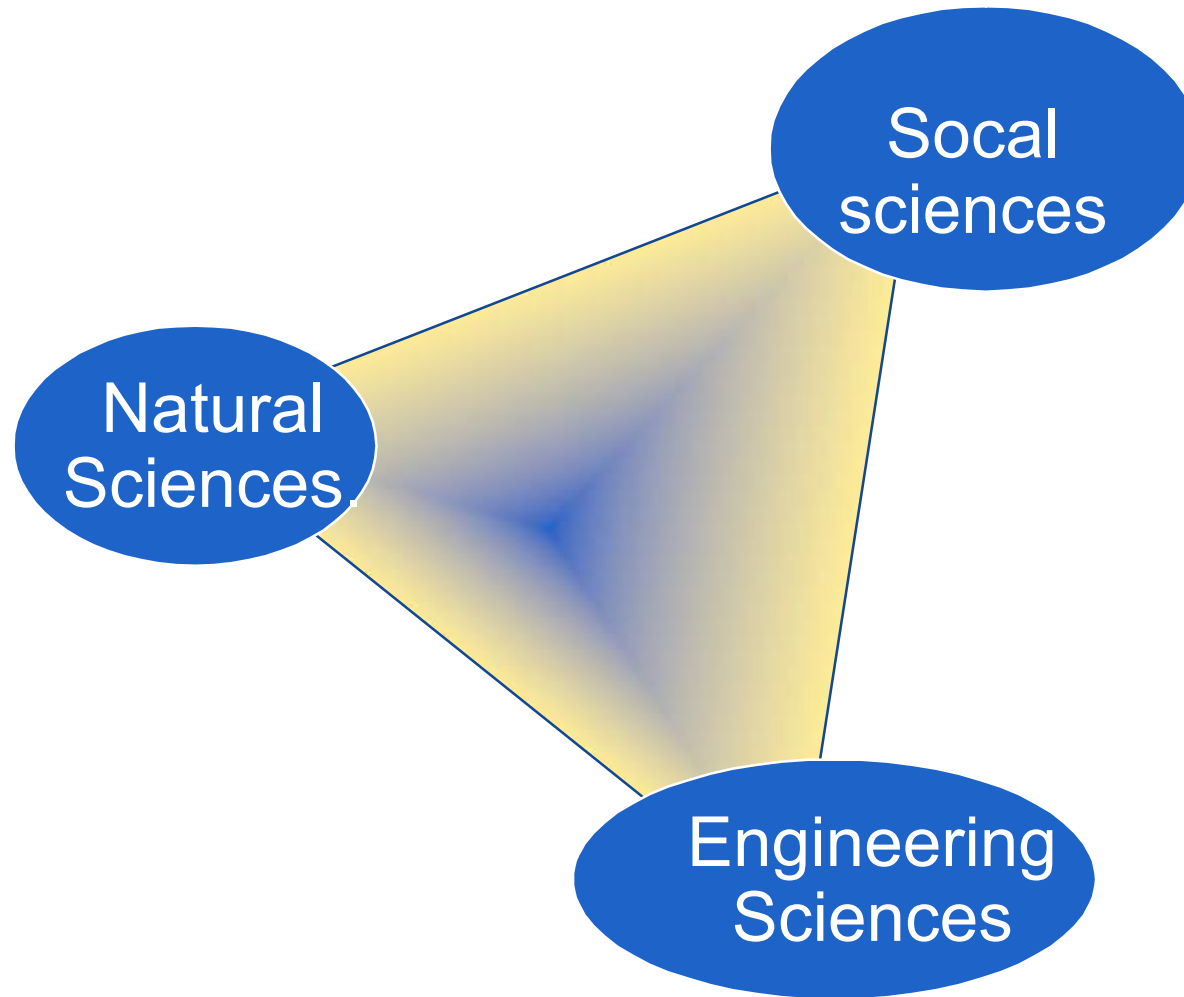
**This new role of agriculture demands also new professionals:
Multidisciplinary and cross-sectorial education involving many
sciences**



The knowledge circle for the new life science professional



OR IS IT A TRIANGLE?



Thank you for your attention

