



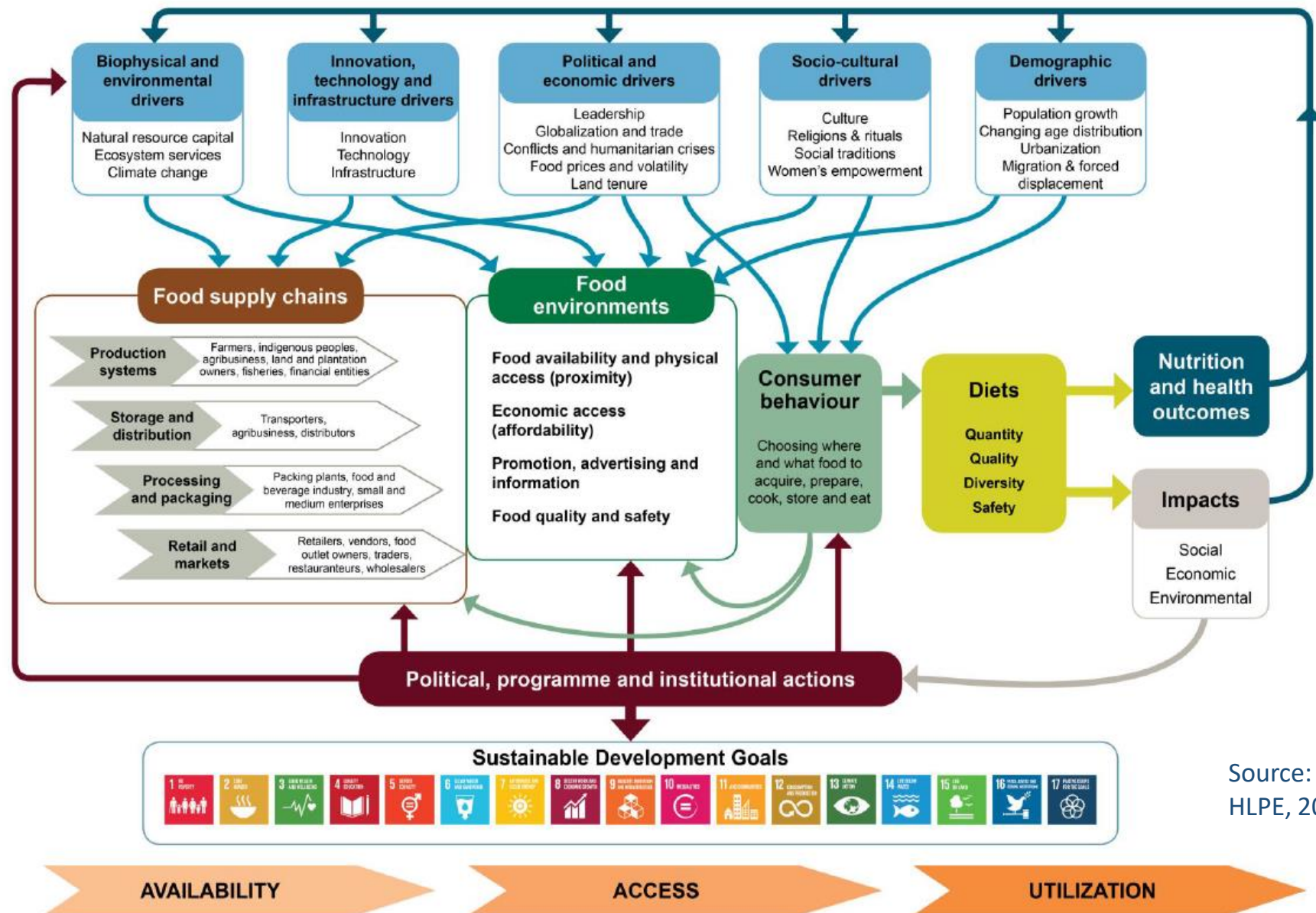
# Practices for sustainable food economies

**Prof. Dr. Ir. Erik Mathijs (KU Leuven)**

Leçon inaugurale de la Chaire Francqui  
Louvain-la-Neuve , 3 March 2020

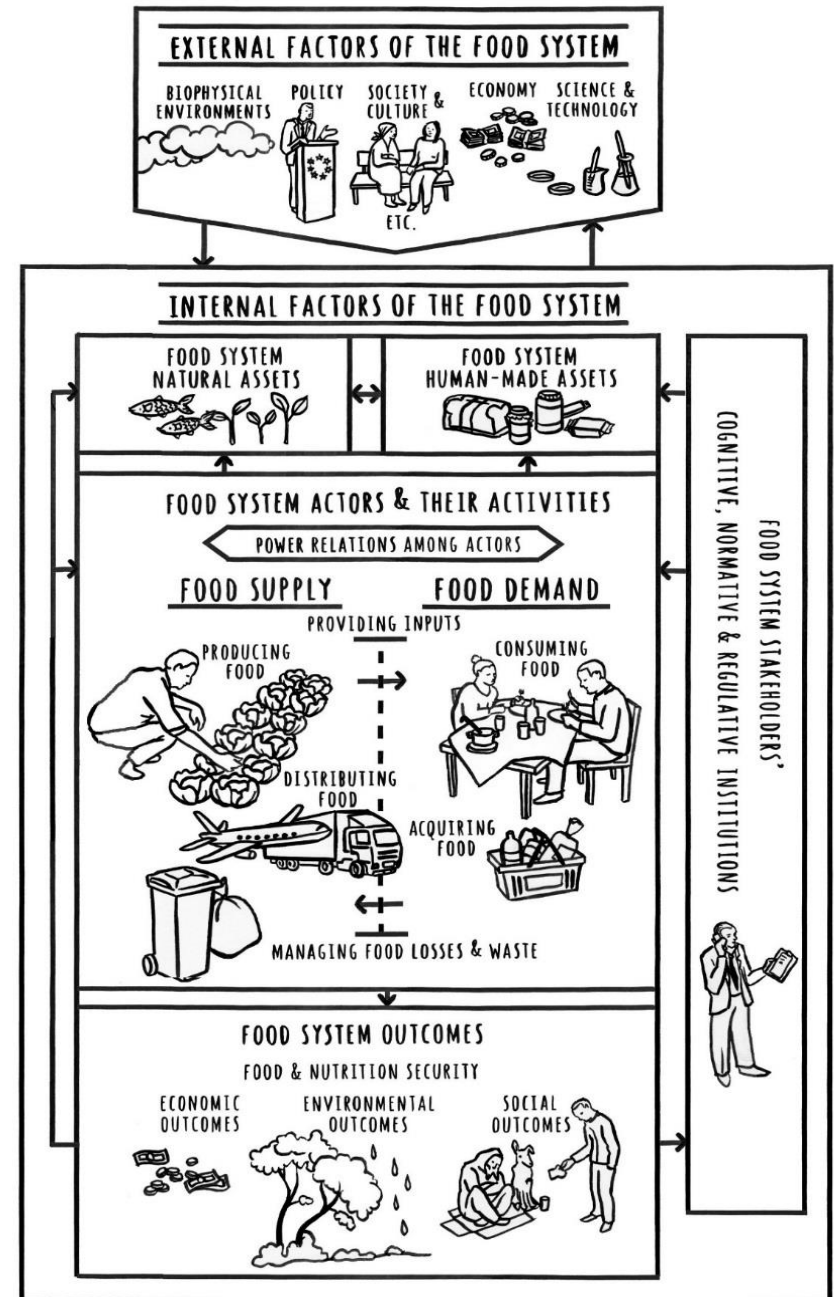
An era of tremendous challenges and opportunities:

- Climate change & environmental pollution
- Biodiversity crisis & resource degradation
- Population growth & nutrition transition
- Obesity and other diseases
- Income inequality & globalization
- Technological advances
- Development of rural areas
- Food and nutrition security for all
- ...



Source:  
HLPE, 2017

Sustainable food systems consists of  
food system **actors**  
who deploy food system **activities**  
to produce desirable **outcomes**  
while sustaining both natural  
and human-made **assets**  
being **resilient** to external  
shocks and stresses  
supported by an enabling  
**institutional** environment



Farmer adoption and  
diffusion of  
**innovations**



Emergence and  
multiplication of food  
system **practices**

Impact evaluation  
and cost-benefit  
analysis



**Sustainability** and  
**resilience** assessment

**Agricultural** policies



**Food** policies

## On metrics:

Current sustainability evaluation methods (Aubin et al., 2011):

- too global or too local
- too linear
- too single-dimensional
- too static
- too predictable and narrow in methodology
- too imprecise
- require data that are difficult to acquire
- are vulnerable to errors

## On policies:

Policy problem 1: Returns for production factors and investment not appropriate for some actors

Policy problem 2: Nature is not sufficiently considered an actor, and thus not compensated

Policy problem 3: Consumer is considered to be outside of value chains, taking 'sovereign' but 'wrong' decisions, leading to undesired outcomes

Economics:

reach an objective in the most  
**efficient** way, i.e., by minimising  
wasting **scarce** resources

**not:** what objective should be  
pursued

competitiveness



innovation



diversification



sustainability



resilience



The international journal of science / 27 February 2020

# nature

## Calling all economists

**Economists and scientists need to reunite – which is why *Nature* is embracing economics.**

**H**e has enriched the world with works that will long remain monuments of science.

Reading *Nature*'s 1873 obituary<sup>1</sup> of the philosopher and economist John Stuart Mill, you would think economists and scientists were two sides of the same research coin – that economics was welcomed as part of the scientific tradition, and vice versa. But that was then. The age of the polymath was coming to an end and researchers were becoming single-discipline specialists. Economists and natural scientists drew apart as universities organized their researchers into engineering, humanities, science and social-science faculties.

The pendulum is swinging back. Economists and scientists are moving closer, as universities and funding agencies embrace more multi- and transdisciplinary research. Over at the World Health Organization, a chief-economist post is being considered. *Nature* will soon appoint an economics editor, following the lead of other *Nature* Research journals, including *Nature Climate Change*, *Nature Energy*, *Nature Sustainability* and *Nature Human Behaviour*.

These moves could not have come soon enough. The world faces a mountain of challenges – and to find solutions, humanity must approach them in multiple ways. One of the biggest puzzles concerns the research enterprise itself. Economists have been pointing out for some years that we don't fully understand why the results of research and innovation – which have ushered in the digital age along with other transformations – are not benefiting

could collaborate to understand other complex networks, such as those involving trade or information. Jim O'Neill, former head of economics research at global investment bank Goldman Sachs in New York City, also reached across the aisle to study the financing of new antimicrobial drugs (see [go.nature.com/2e3bkmj](https://go.nature.com/2e3bkmj)). Economics research, he says, could demonstrate the costs and benefits of investing more in public health, to encourage governments in low- and middle-income countries to make such investments.

Similarly, with the pharmaceutical industry and governments still not properly funding development of a badly needed new generation of antibiotics, he says, biomedical researchers need to collaborate with economists and public-policy specialists to create a workable financial model.

The environment is one area in which natural-science researchers and economists do have a long-standing shared interest. Economics research, for example, is assessed by the Intergovernmental Panel on Climate Change, and *Nature*'s research and comment sections publish influential work from ecological and environmental economists<sup>2</sup>.

But here, too, there's potential for more joint problem-solving. Success in many of the United Nations Sustainable Development Goals will require an understanding of how far economies can continue to grow within planetary limits. But there are many views on this, including various intellectual traditions in economics. Some economists, for example, argue that a planet under pressure from industrialization cannot withstand continued economic growth. But for others, growth is essential to alleviating poverty – as long as growth becomes greener.

To solve these problems, economists, natural and social scientists and engineers must all engage with and learn from each other. It is often too easy to say 'more research will help'. But here, it is necessary – especially economics research, which we look forward to publishing.

**“More economists than ever are reaching across disciplinary divides, and they want journals to recognize the results.”**

1. *Nature* 8, 47 (1873).

2. Haldane, A. G. & May, R. M. *Nature* 469, 351–355 (2011).

3. Costanza, R. et al. *Nature* 387, 253–260 (1997).

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## ***Challenges:***

**Inter- and transdisciplinary:** economics + sociology, psychology, management, environmental sciences + stakeholders

**Reductionist → integrated and holistic methods**

The role of **multiple** paradigms and theories



**On practices**



family ☐ industrial  
small ☐ large  
conventional ☐ alternative  
rural ☐ urban  
North ☐ South  
processed ☐ raw  
GMO ☐ agro-ecology  
land sparing ☐ land sharing  
animal ☐ plant  
regime ☐ niche

Polarization ('OR') →  
dialectical change

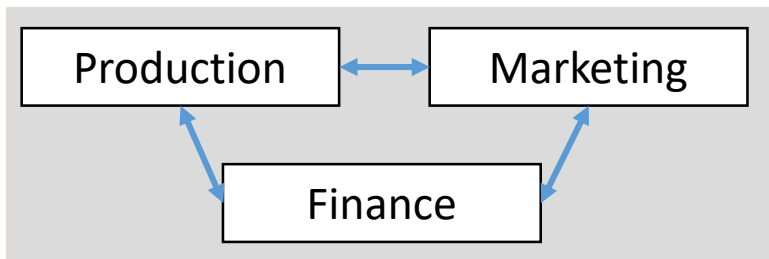
Synthesis ('AND') →  
change through  
reconfiguration and  
reassembly



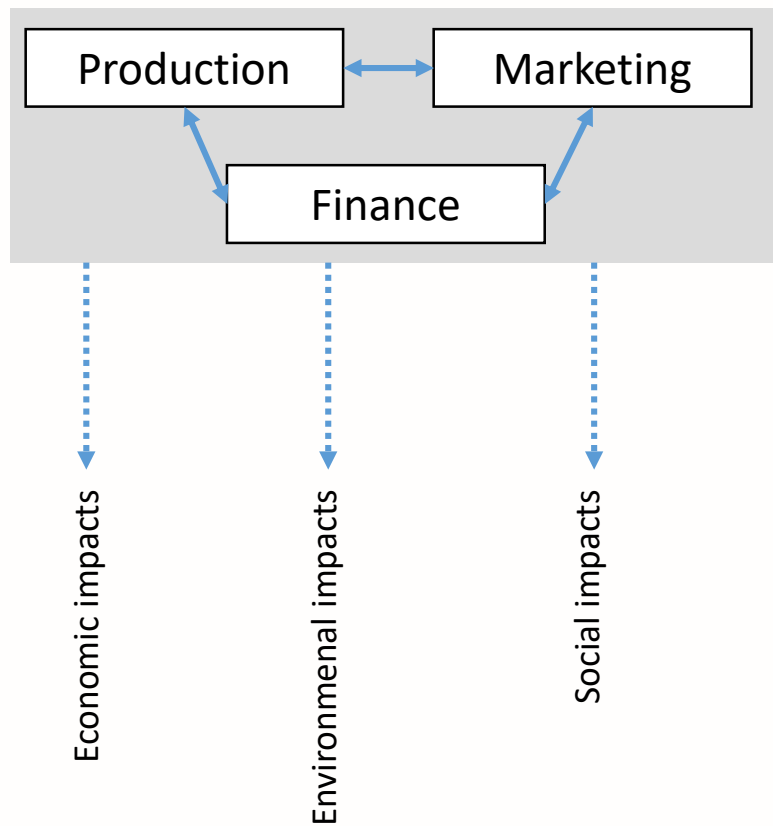
Production

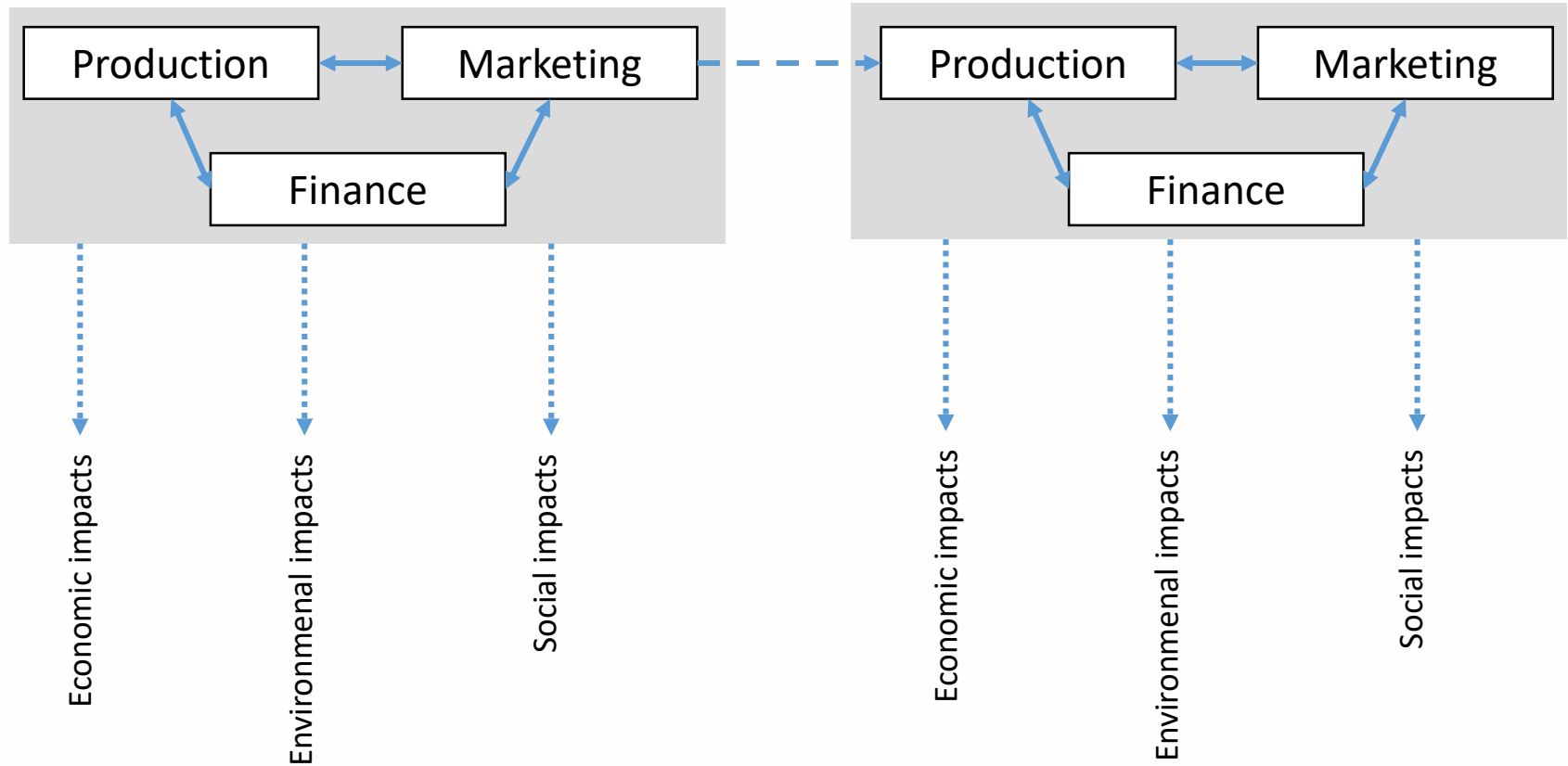


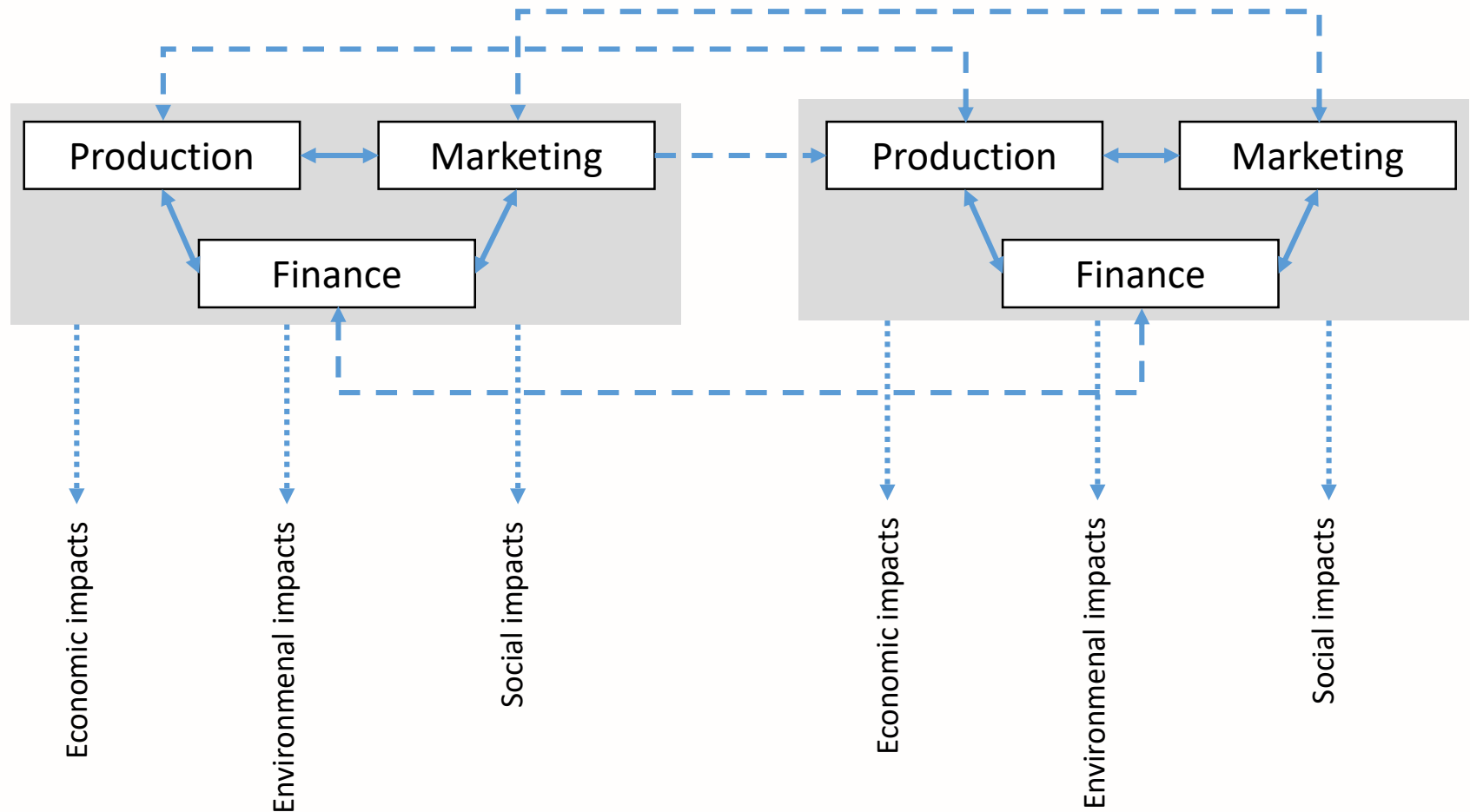


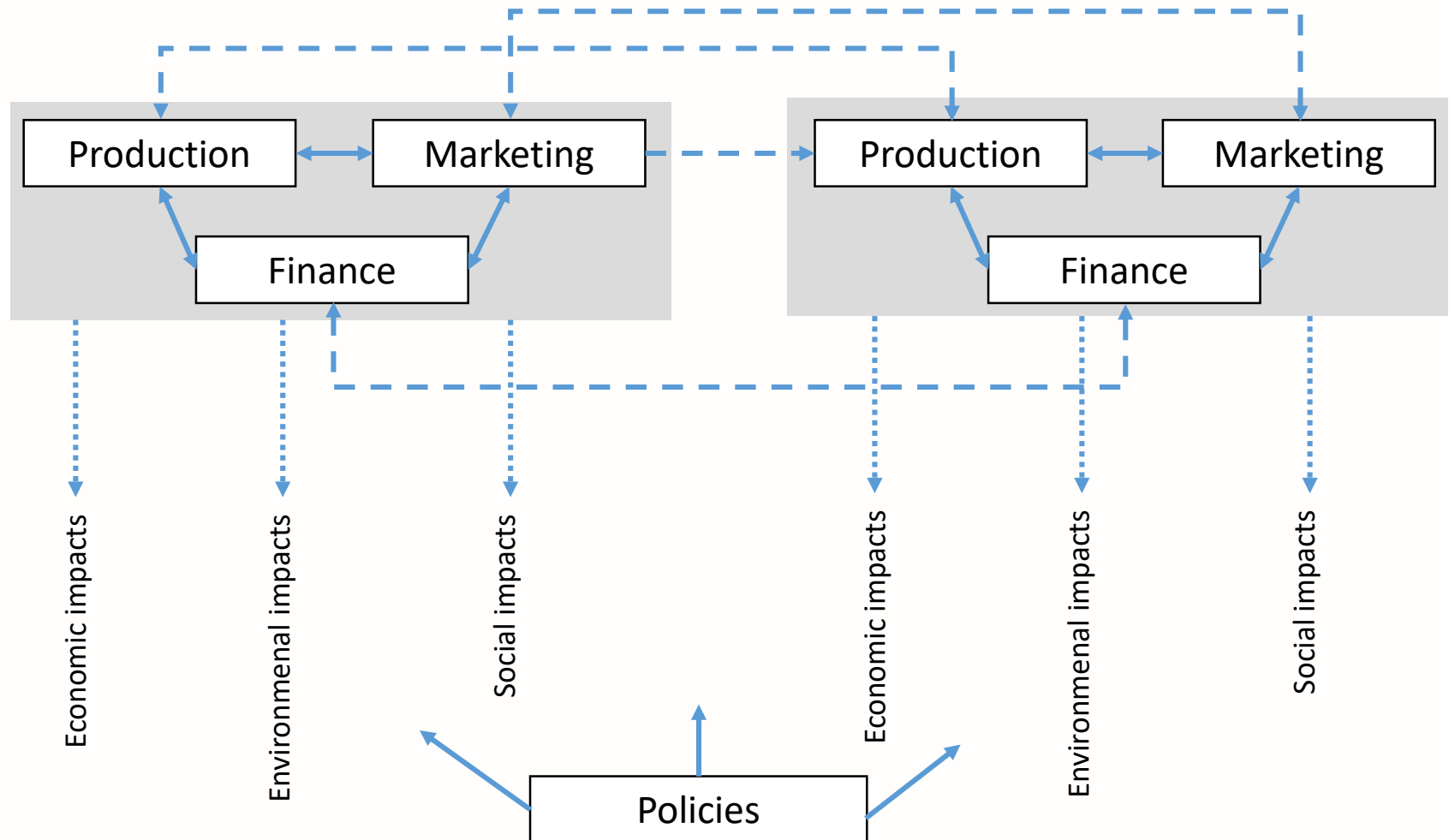












**Barriers to consumer satisfaction:**

- Space/place separation
- Time separation
- Ownership separation
- Value separation
- Information separation

**Marketing functions:**

- Exchange
  - Selling
  - Buying
- Physical
  - Processing
  - Storage
  - Transportation
- Facilitating
  - Standardisation
  - Finance
  - Risk bearing
  - Market intelligence

**Utilities (satisfaction) added by marketing:**

- Form
- Place
- Time
- Possession

**Spot market** exchange → insufficient coordination of actions across supply chains when:

- Products are perishable
- Products are differentiated
- Product quality is difficult to observe
- Consumers value new product characteristics
- Liability and traceability requirements increase
- ...



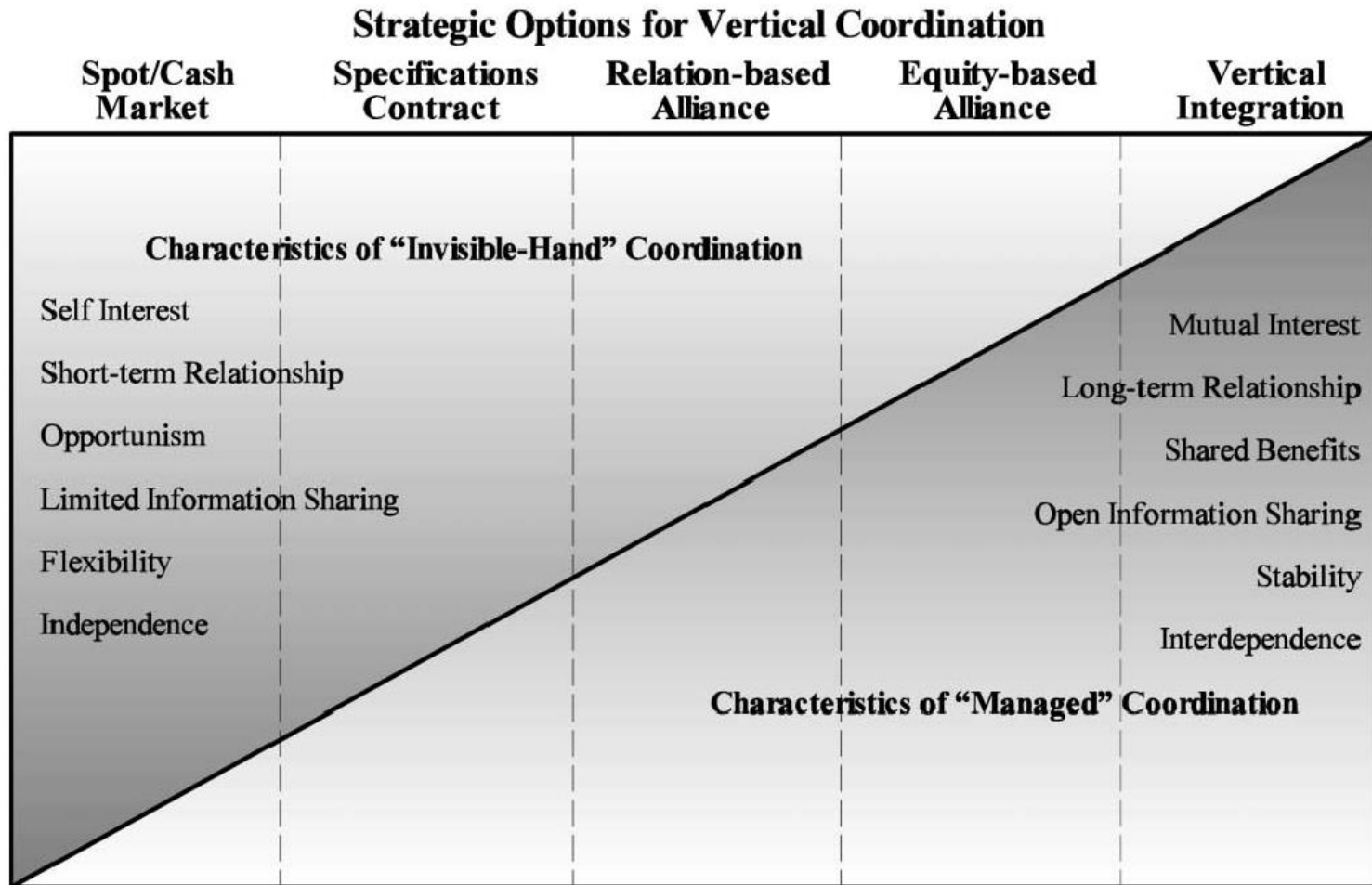
Hobbs and Young (2000)

**It's a jungle out there – the strange  
animals of economic organization in  
agri-food value chains**

edited by:  
Gaetano Martino, Konstantinos Karantinidis,  
Stefano Pascucci, Liesbeth K.E. Dries and  
Jean Marie Codron



Wageningen Academic  
Publishers



**NOTE:** The diagonal line represents the mix of invisible-hand and managed coordination characteristics found in each of the five alternative strategies for vertical coordination. The area above the diagonal indicates the relative level of invisible-hand characteristics and the area below the diagonal indicates the relative level of managed characteristics.



## Benefits from closer **vertical** coordination:

- Less stock
- Less waste
- Better match between supply and demand (quantity, quality)
- Less transaction costs

But: higher interdependency with risk of opportunistic behaviour and hold-up



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## Colruyt prépare un « écoscore »

Published in  
Food on 02-01-  
2020

Redactie





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Published in  
Food on 08-10-  
2018

[Pauline Neerman](#)



## Benefits of closer **horizontal** coordination:

- Capture economies of size and scope (risk pooling, marketing, input provisioning,...)
- Economise on transaction costs (joint negotiation)
- Build countervailing power
- Competitive yardstick

But: solidarity under pressure with increasing farmer heterogeneity (farm size, quality)

### Physical flows

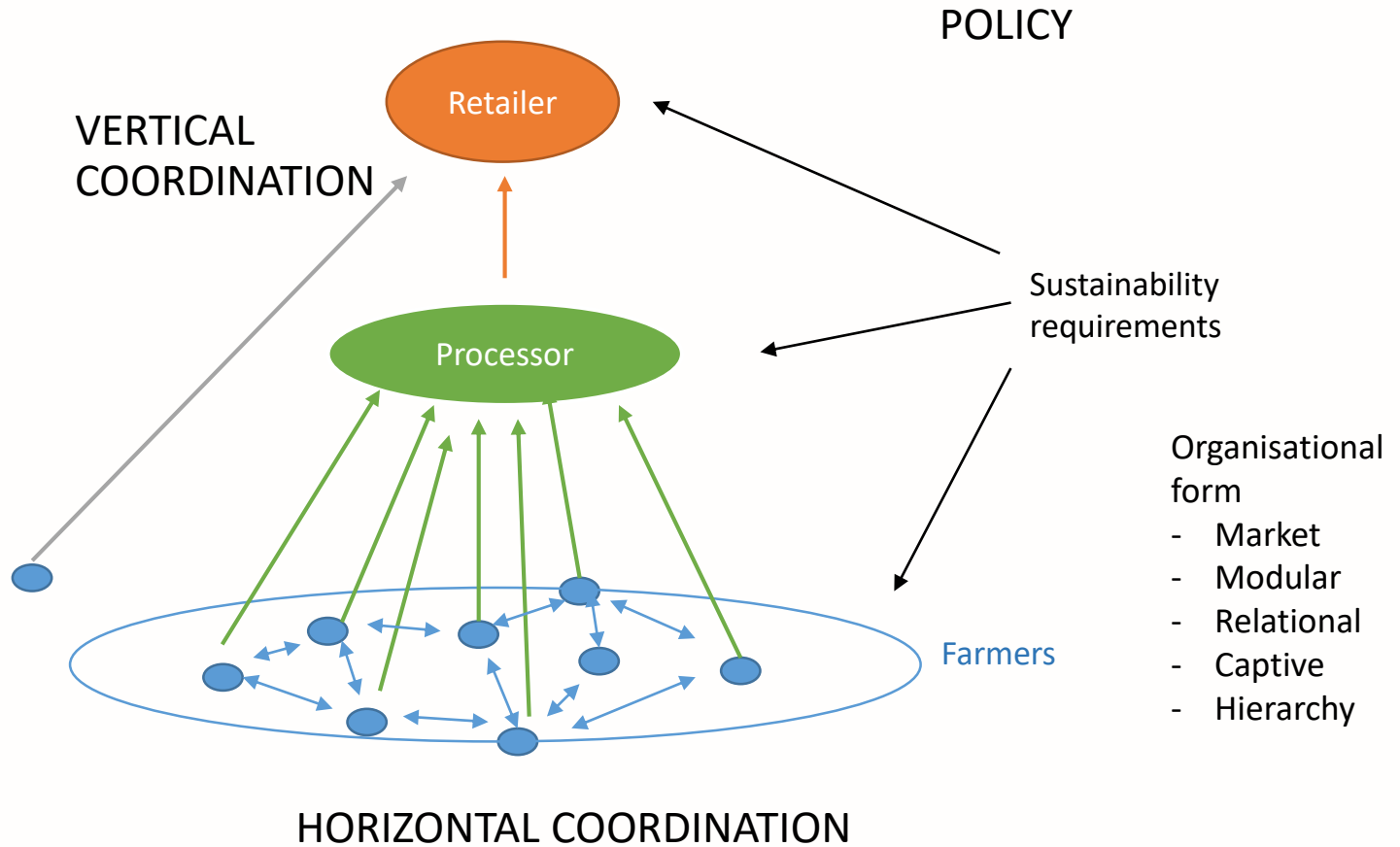
- Storage
- Sorting
- Packaging
- Processing
- Transporting
- Inputs

### Monetary flows

- Price
- Added value
- Downward risk
- Investment

### Information flows

- Standards
- Labels, brands
- Knowledge





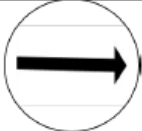
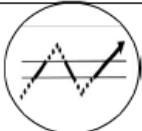



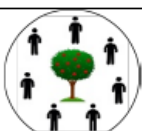
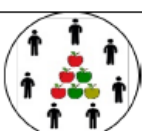


## *Question 1:*

*What kind of arrangements do farmers prefer?*

- Price and volume
- Risk
- Specifications



Discrete choice  
experiment,  
Flemish apple &  
pear farmers,  
preferences for  
marketing channel  
attributes  
(Bonjean et al.,  
2020)

Attribute	Attribute level	Pictograph
Price volatility	The price is constant during the whole season	
	The price may fluctuate between -10% and +10% of the average price during the season	
	The price fluctuates very strongly during the season	
Performance poolin	The price determined by both your individual performance as the one of other farmers	
	The price is determined by your individual performance	
Early agreement	The agreement is made at start of the sales season	
	The agreement is made during sales season, for each transaction	
Brokerage	There is brokerage	
	There is no brokerage	

Note: the levels of the price attribute are not displayed in this table

- Main results:
  - Farmers prefer to maintain some price volatility over a single constant price.
  - The majority of farmers prefers revenue to be fully dependent on their individual performance.
- Trade-offs in marketing channel design between
  - limiting farmers' risk exposure,
  - their price speculation opportunities
  - exposure to free-riding problems.



## *Question 2:*

*Can horizontal and vertical coordination be combined?*

- Combine advantages of horizontal with those of vertical coordination
- Branche organisations (MilkBE): sector-wide non-price coordination
- Private initiative?



Home > Nieuws > Samenwerking Veiling Haspengouw en UNIVEG is rond



31.08.2015 Samenwerking Veiling Haspengouw en UNIVEG is rond



De intentie tot samenwerking tussen Veiling Haspengouw en UNIVEG is rond. De intentie tot samenwerking tussen Veiling Haspengouw en UNIVEG is rond. De intentie tot samenwerking tussen Veiling Haspengouw en UNIVEG is rond.

## PERSBERICHT

### Greenyard Foods stapt uit Veiling Haspengouw

Sint-Katelijne-Waver, België, 2 september, 2016

**Greenyard Foods maakt bekend dat er een akkoord is met Veiling Haspengouw om volledig uit het aandeelhouderschap te stappen. Greenyard Foods zal zijn participaties in H-Fruit en H-Pack verkopen aan Veiling Haspengouw.**

Greenyard Foods maakt bekend dat er een akkoord is met betrekking tot een volledige uitstap uit Veiling Haspengouw. De aanhoudende Ruslandboycot, gecombineerd met slechte weersomstandigheden, zorgt aanhoudend voor problemen bij de lokale, Belgische telers. De Raad van Bestuur van Veiling Haspengouw heeft haar wens uitgedrukt om horizontaal te integreren met andere coöperaties. Een samengaan met andere marktpartijen zou het mogelijk maken om de nodige kostenbesparingen te realiseren.

Greenyard Foods wenst Veiling Haspengouw te steunen in haar beslissing om schaalgrootte te creëren hetgeen de efficiëntie ten goede komt. Daardoor werd er gekozen om uit de joint venture te stappen. Het akkoord houdt in dat de aandelen in H-Fruit (50,00%) en H-Pack (50,01%) volledig door Veiling Haspengouw worden overgenomen.



Adverteren | Handboeken | Ons team | Reageren | Werken bij AGF.nl



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groenten	fruit	bananen	citrus	aardappelen	uien	bio	exoten	kruiden	noten
bedrijfsnieuws	detail	retail	koeling	automatisering	logistiek	verpakkingen	machines	management	agenda



Greenyard Foods over einde samenwerking met Veiling Haspengouw

**"Greenyard verkiest verticale boven horizontale integratie"**

Tholen - "Vorig jaar heeft Univeg haar verantwoordelijkheid genomen toen Veiling Haspengouw een partij zocht. We hebben een jaar geprobeerd om samen te werken maar de marktomstandigheden beslisten hier anders over", reageert Greenyard Foods op het stoppen van de samenwerking met Veiling Haspengouw.

#### Markt niet pushen

Veiling Haspengouw kwam dit jaar zelf naar Univeg toe om aan te geven dat ze horizontaal wilden integreren met andere coöperaties. "Voor ons zou dat moeilijk werken. Als zij gingen samenwerken met andere veilingen werd het voor ons allicht niet gemakkelijk. Greenyard legt de focus namelijk zo veel mogelijk op verticale integratie. Dat wil zeggen dat we echt naar fork to field gaan om te keten zo kort mogelijk te houden. Wij zoeken naar producten in de markt naar aanleiding van de klantvraag. Niet omgekeerd. Dit is toch verschillend van de plannen die Haspengouw zelf in gedachten had. We hebben toen besloten om uit mekaar te gaan."

#### Omstandigheden zaten niet mee

Greenyard Foods geeft aan dat ze van tevoren al wisten dat het een transactie was met een hoog risicogehalte. "Natuurlijk hebben we ontzettend hard gewerkt, maar de omstandigheden zaten niet mee. De Rusland-boycot blijft aanhouden. Ook het komende hardfruitseizoen wordt moeilijk."

Samenwerkingen met andere veilingen sluit Greenyard Foods niet uit. "Wij werken al veel samen met veilingen en coöperaties, maar het liefst verticaal als we de mogelijkheid hebben. Zo kunnen we meer controle over de kwaliteit en versheid van het product houden in een kortere keten."

Publicatiedatum: 6-9-2016

Auteur: Gertrude Snoei



Home > Nieuws > Samenwerking Veiling Haspengouw en UNIVEG is rond



31.08.2015 Samenwerking Veiling Haspengouw en UNIVEG is rond



De intentie  
onderteken  
perenpluk-  
door de sa-  
financiële s-  
de positie van de Belgische fruitteler versterkt

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Publicatiedatum: 6-9-2016

Auteur: Gertrude Snoei



## *Combination of horizontal and vertical coordination?*

Qualitative analysis of cooperative club marketing in the Belgian apple sector (Lievens et al., 2020):

- Aim: overcome quality issues related with farmer heterogeneity (adverse selection), open membership and obligation to sell all produce
- Club marketing as solution: club membership, differentiated product, better prices

## INFO

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Luxembourg

Flandre

# Le Groupe Colruyt valorise deux nouvelles variétés de pommes



*Question 3:*

*How to shorten supply chains efficiently?*

- Vertical coordination is easier with less actors involved
- Value added has to be distributed among less actors
- Marketing functions have to be performed by remaining actors
- Alternative or mainstream?



## Alternative food networks (AFNs)

**Table 1**

Type of social enterprises covered in the study of the CFBGs operating in Belgium. “Non-distribution constraint” refers to non-distribution of assets or income to individuals as owners or managers except for fair compensation for services rendered (Anheier, 2005, p. 40). “Limited distribution constraint” allows for the distribution of profits, but under strict conditions defined in the regulatory framework.

	Legal form	Cases analysed in this paper (details of acronyms in Table 2 below)	Paid work	Voluntary work
Total non-distribution constraint	Association	GAC/AMAP/GASAP Voedselteams La Ruche qui dit Oui	To the farmer (produced food)	Accounting Product search
Limited distribution constraint (under Belgian and French law)	Social interest solidarity enterprise (ESUS: France, Decree of 5 August 2015)		To the farmer (produced food) To the software designers (8,35% of the sales) To the person making selling space available (8,35% of the sales)	Organisation of meetings Educational activities Training Network activities Support to other food buying groups Software (except for “La Ruche qui dit Oui”)
	Social interest Cooperative enterprise (CVBA-so: Belgium, law of 13 April 1995)	CSA (Community Supported Agriculture)	To the farmer (produced food)	

Dedeurwaerdere et al. (2017)

## Main results:

- Social enterprise activities: organisation of food provisioning logistics
- Social network activities: sharing of resources with other sustainable food initiatives, dissemination of information and broader discussion on sustainability issues.
- Social networking activities of these groups → specific governance mechanisms

Dedeurwaerdere et al. (2017)



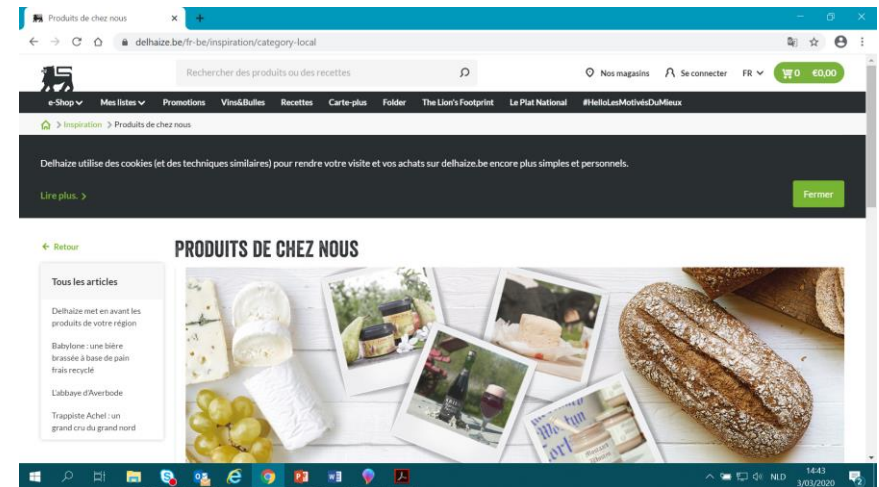
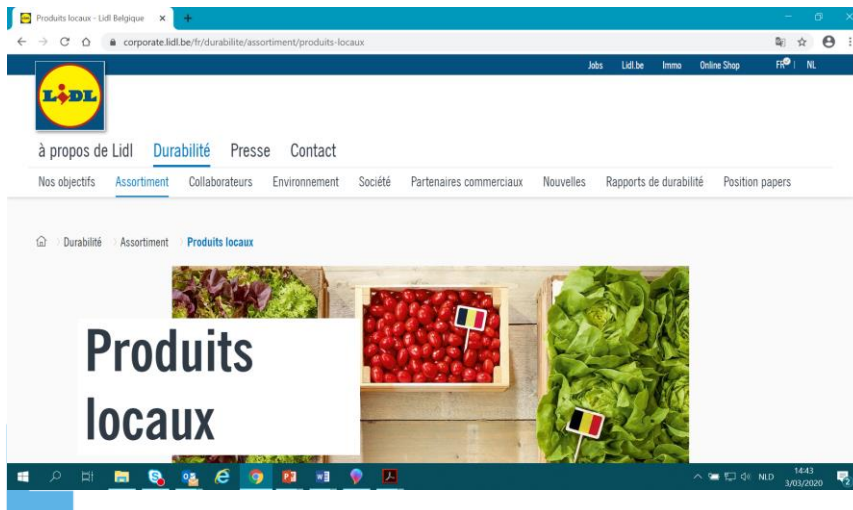
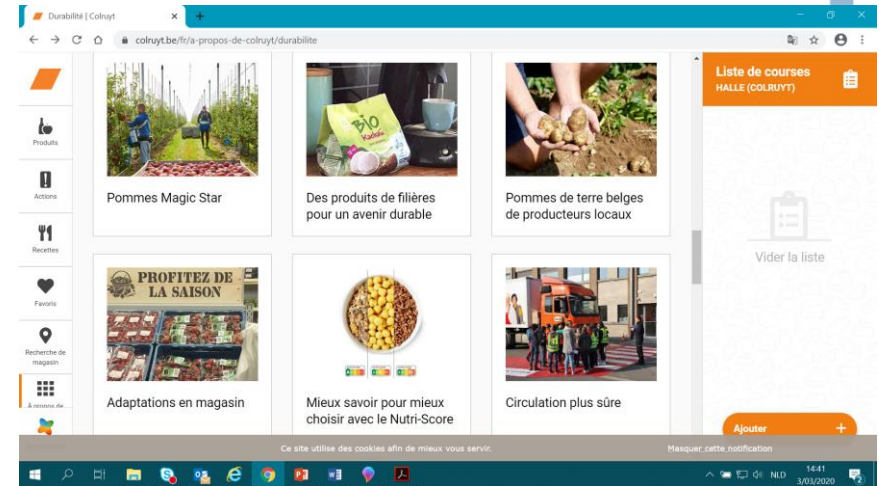


## Hybridisation of AFNs: analysis of *Voedselteams*

- Hybridisation of AFNs to scale-up and increase stability (Cerrada-Serra et al., 2018):
  - Professionalisation of logistics and software
  - Expansion of member base and of the offer (e.g., off-season)
- Importance of matching the new practice with existing practices in everyday life (Zwart and Mathijs, 2020)

## Hybridisation of mainstream systems: exploring local-to-retail through direct contracting

- Increasing trend: direct farmer-to-retailer contracts, cutting out wholesale or cooperatives
- Key: trust and reputation (to avoid hold up), but:
- Access to such contracts is limited (which may result in their **delegitimisation** by some actors)
- Trust is not always present in all types of contexts (sector, region)



## Hybridisation of mainstream systems: exploring local-to-retail through upscaling CSA principles

- Consumers' willingness to participate in scheme in which consumers
  - commit to buy a farmer's produce, using retail logistics, stating intended annual purchases before the season
  - accept produce with cosmetic and form defects
- Upscaling of CSA principles

## Hybridisation of mainstream systems: exploring local-to-retail through upscaling CSA principles

- Choice experiment with 954 households frequently buying organic
- Main results:
  - 43% is willing to join a scheme, 20% already member
  - No 100% commitment: some flexibility needed
  - Half of respondents willing to accept defects without compensation

Bonjean and Mathijs (2020)

**Concluding  
remarks**

- Sustainable food economies require closer horizontal and vertical coordination in order to reach sustainability goals in an efficient way
- Horizontal and vertical coordination are difficult to combine due to conflicting values and interests
- Food system reassembly or reconfiguration may overcome the difficulty of combining vertical and horizontal collaboration
- Needs to take into account existing food system practices or requires other practices to also change
- Any change has to deal with issues of (de)legitimisation (see also lectures on 27/4 and 4/5)

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Towards SUsustainable and REsilient EU FARMing systems (H2020) – [surefarmproject.eu](http://surefarmproject.eu)



Low-Input Farming and Territories (H2020) – <http://www.lift-h2020.eu/>



Innovative down-scaled Food Processing in a Box (H2020) – [www.fox-foodprocessinginabox.eu/](http://www.fox-foodprocessinginabox.eu/)



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