

*Future farmland requirements in a densely
populated area:
The case of Flanders in Europe*

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Introduction

Land use and its policy face modifications caused by:

EU enlargement, climate change, diversification of regional economy, structural changes in agric, **demographic changes** (Verburg, 2006; Verboom, 2007; Busch, 2006)

⇒ Increasing population density ⇒ demand for space for different purposes ⇒ limits land for agriculture (Heimlich, 2001)

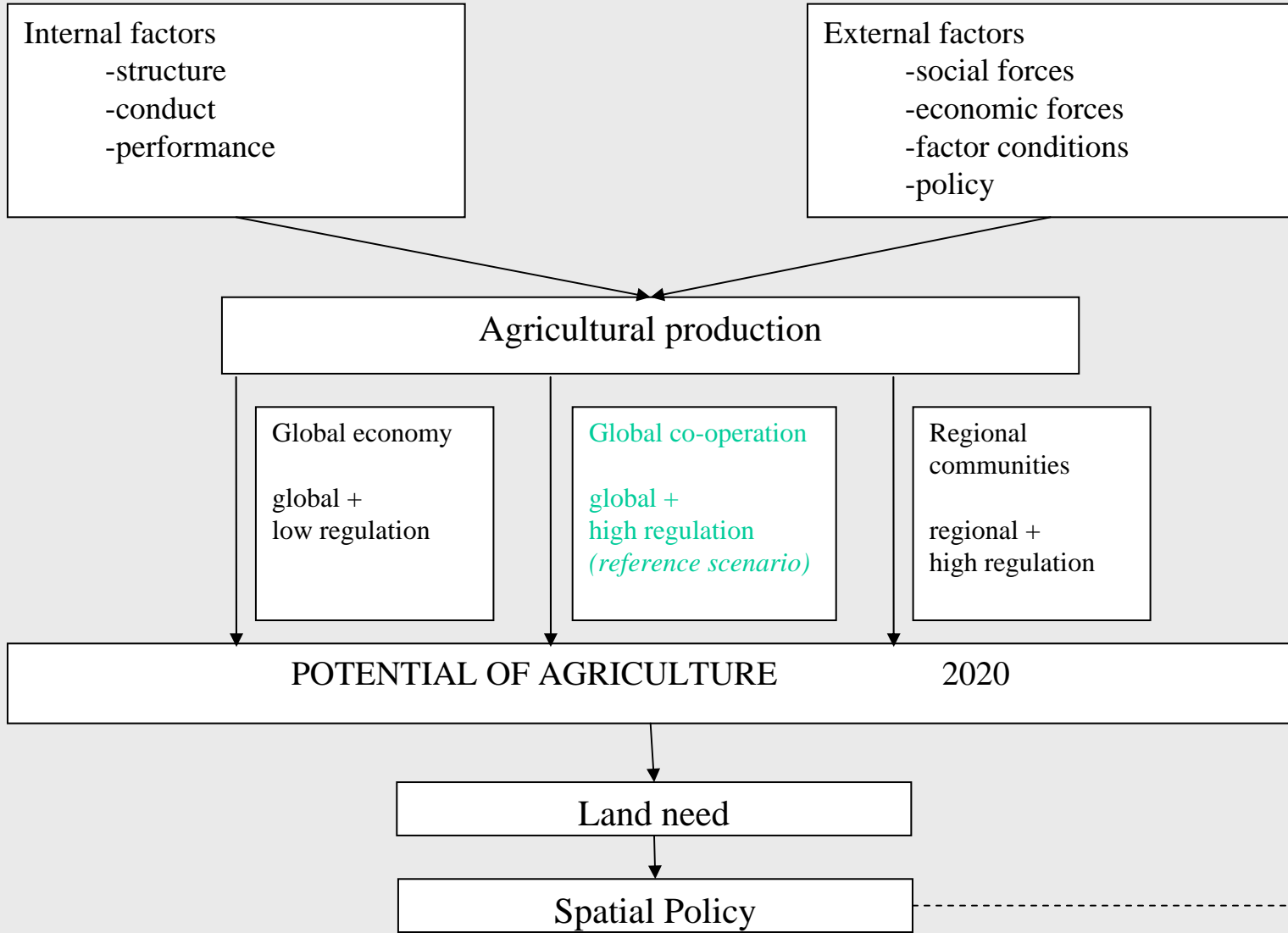
⇒ **Spatial planning policy** ⇒ for the future

⇒ Based on research by scientists

⇒ How to define land need in the future?

Conceptual Framework

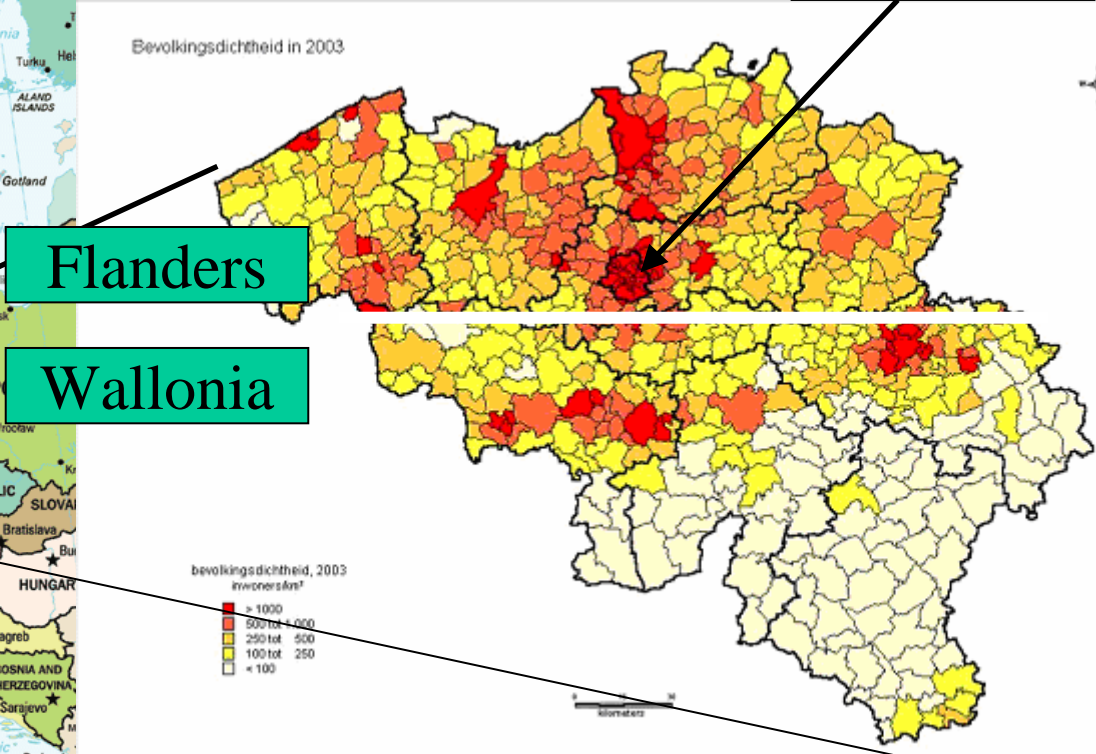
- Although contribution of agric to GNP is limited
- Agric is wanted by society, is a valuable activity
- How much land does it need?





FACULTEIT BIO-INGENIEURSWETENSCHAPPEN

Brussels



Flanders

Wallonia

General characteristics

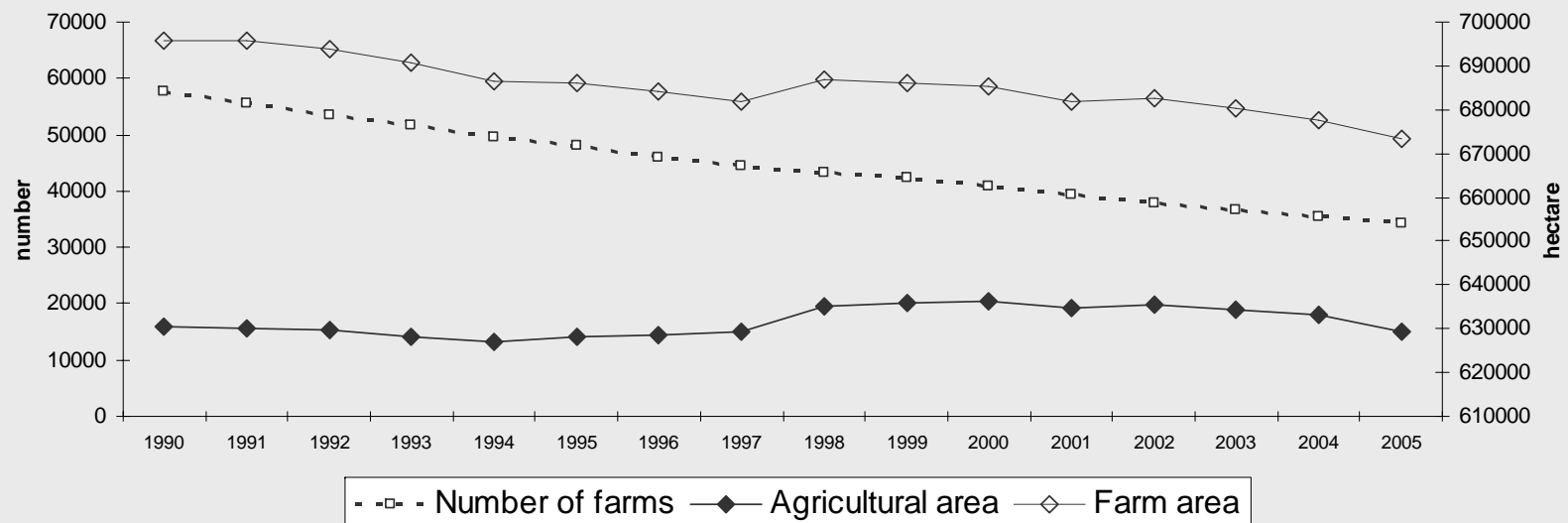
	Flanders	US
Population	6 million	302 million
Area	13.5 thousand km ²	9 million km ² = Connecticut (2nd smallest)
Population density	448 inhabitants/km ²	31 inhabitants/km ² Higher than any state Mean density in EU : 116 inhabitants/km ²

Agricultural Characteristics

- 50% of land is used by agriculture
 - 60% used by cattle, 30% by arable farming and 10% by horticulture
- Share of agriculture in GVA = 1.3%
 - Mostly created by pigs, cattle and vegetables
- 18 ha per farmer (0.18km²)

Agricultural Characteristics

**Number of farms, agricultural and farm area in Flanders
1990-2005**



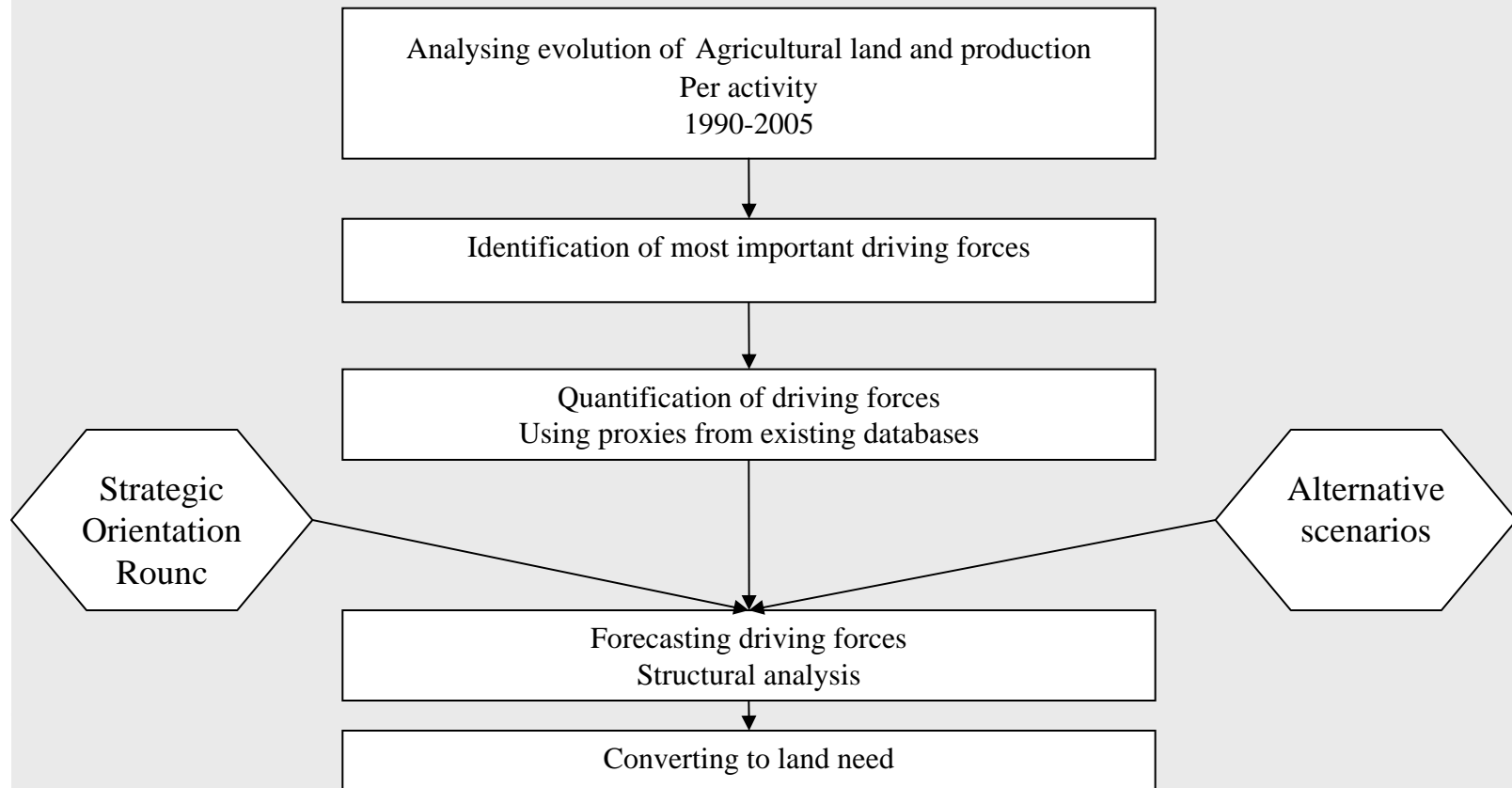
Empirical Analysis

• Dependent Variables

- Data on end production values
- Added value not available for each activity

	2005 End production value (€ million)
SECTOR ARABLE FARMING	
o Grain	66.3
o Sugar beat	114.3
o Potatoes	187.6
o Other arable crops (corn)	65.7
SECTOR HORTICULTURE	
o Vegetable in open air	313.2
o Greenhouse vegetables	256.9
o Fruit	303.5
o Ornamental plant cultivation	457.2
SECTOR GRAZING ANIMALS	
o Dairy cattle	549.2
o Meat cattle	491.4
o Fodder crops and grazing land	
SECTOR NON-GRAZING ANIMALS	
o Pigs	1295.2
o Laying hens	231.1
o Fryers	113.8
Totaal	

Empirical Analysis



Step 1 Describing the evolution of agricultural land and production (90-05)

Question: How did agricultural production develop in the past?

Method:

- Trend analysis on data from 1990-2005
- ARIMA model

• *Results:* First impression of future expectations

- No explanation for development

Step 2 Identifying driving forces for agriculture

Question: What drove agricultural production in the past?

Method: Based on literature

- Porter's diamond for external driving forces
- Structure-Conduct-Performance model for internal

Results: Definition of driving forces that explain past developments (SWOT matrix)

Step 3 Quantifying these driving forces

Question: How can we quantify these driving forces?

Method:

- Find proxies for the driving forces
- Regression analysis

$$vEP_{ta} = \alpha + \sum_{i=1}^p \beta_i (\text{External factors}) + \sum_{i=1}^q \delta_i (\text{Internal factors}) + \mu$$

Results: Define relative importance of each force

Step 4 Forecasting the driving forces (2020)

Question: What will be the estimated development of the selected driving forces?

Method: Strategic Orientation Round

- Subjective preferences, Expert knowledge, Objective information
- Based on assumptions, scenarios

• *Results:* refinement of the structural analysis

Step 5 Converting to land need

Question: What is the expected land need for agriculture?

Method: Expected production value / productivity

- Time series analysis + forecast
- Adjusted to expected changes in legislation

Results: land need estimations

Results: Potatoe production

Strengths

High productivity
Market oriented
Promotion efforts

Weaknesses

Soil erosion
Parcelled out areas
Small scaled
Focus on only one variety



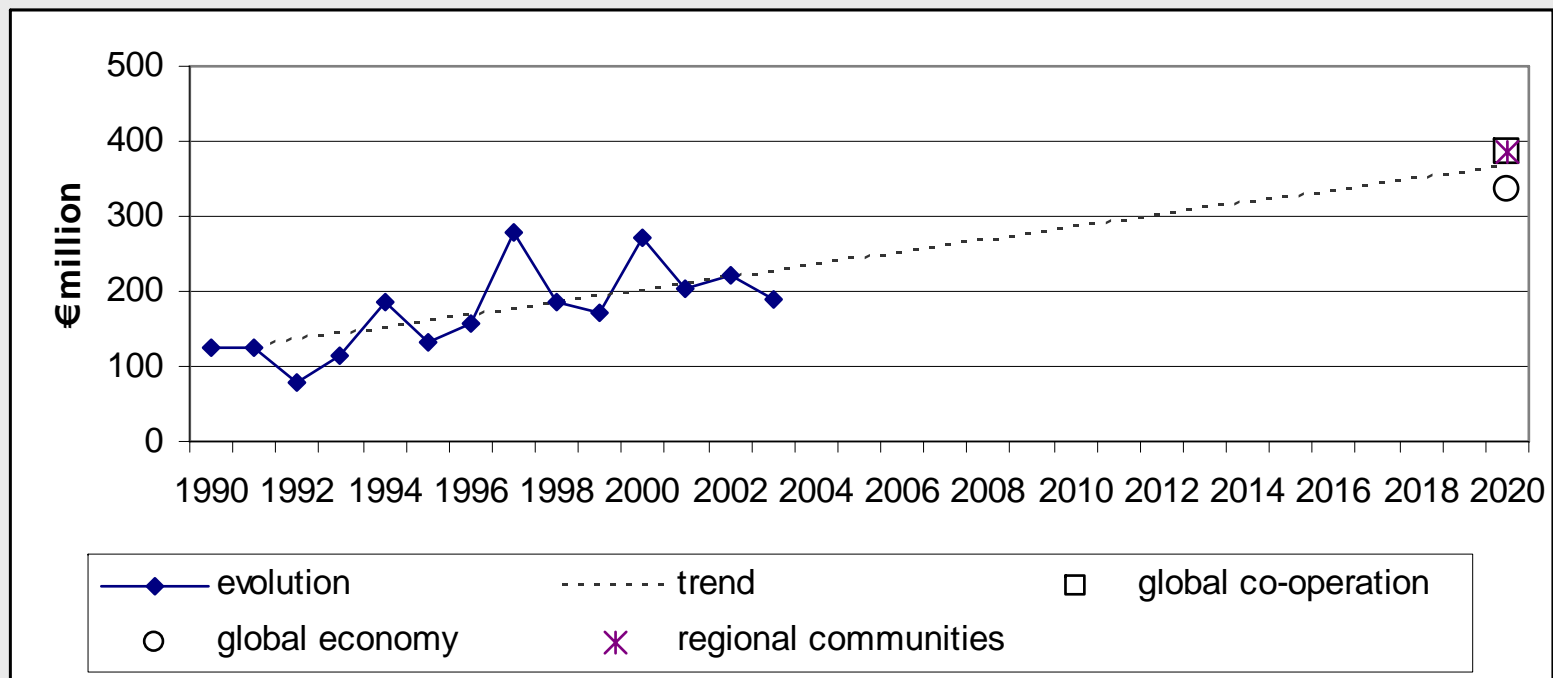
Opportunities

Increasing consumption
Strong processing sector
Bio-energy production

Threats

Increasing competition
Fluctuation in prices
Price pressure by retail

Results: Potatoe production



Results: Need for farm land (ha)

Arable farming	2005	2020
Cereals	93,363	59,035
Sugar beets	33,496	44,998
Potatoes	41,135	77,717
Other	66,835	49,191
Energy crops	153	1,163
Total	234,982	232,104

Horticulture	2005	2020
Vegetables in open air	33,183	39,939
Greenhouse vegetables	3,392	5,935
Ornamental plants	9,094	9,761
Fruit	15,006	25,638
Total	60,675	81,273

Results: Need for farm land (ha)

Animal production	2005	2020
Cattle	369,652	358,950
Horses	10,191	15,150
Pigs	903	1,408
Fryers	231	265
Laying hens	353	159
Total	381,330	375,932

Total Flemish agriculture	Need for farm land (ha)
2005	676,987
2020, Global co-operation	689,309
2020, Global economy	619,334
2020, Regional communities	755,008

Policy recommendations and research agenda

- Scenario approach: degrees of freedom for policy makers -> merely an instrument, not the only truth
- **Spatial Plan Flanders**
 - Added value AND social appreciation
 - Strategic policy plan with specific projects
 - Target figure