SMART SURVEYORS FOR LAND AND WATER MANAGEMENT
CHALLENGES IN A NEW REALITY

Presented at the FIG e-Working Week 2021
21-25 June 2021 in Virtually in the Netherlands

FIG**NL**
THE NETHERLANDS

e **WORKING WEEK 2021**
20-25 JUNE

Bastiaan P. Reydon
11183

Land Governance for Land Markets

23/06 at 20:00

Land Governance for Land Markets

Bastiaan P. Reydon

Marije Louwsma

June 2021

Summary

- Land price determinants theory and an Institutionalist proposition

- Mass Land Valuation – techniques and examples – the bunded system;

- Dutch system – cadaster integrated with valuation for taxation and others

- Hedonic prices: an example from Brazil

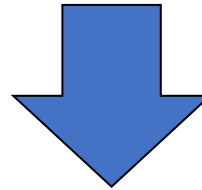- Bunded system for land consolidation: a case from the Netherlands

A Global Land Administration Perspective

Enemark , Williamson (2010)
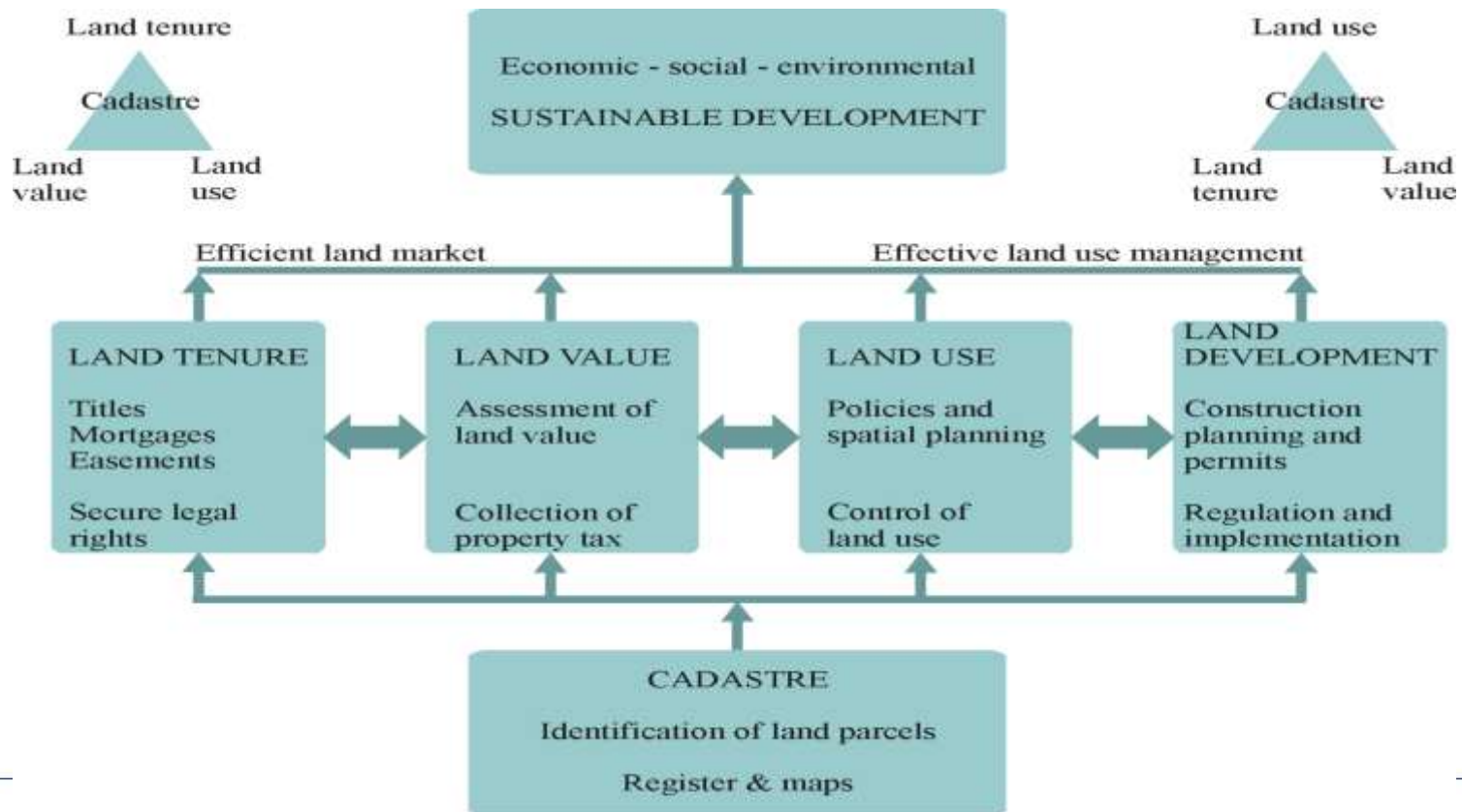
Adequate Land Administration and Land Markets

- Good/transparent Land registers and mapped cadaster – secure property rights;

- Land Markets functioning well:

➢ Efficient Renting markets – cost/benefits

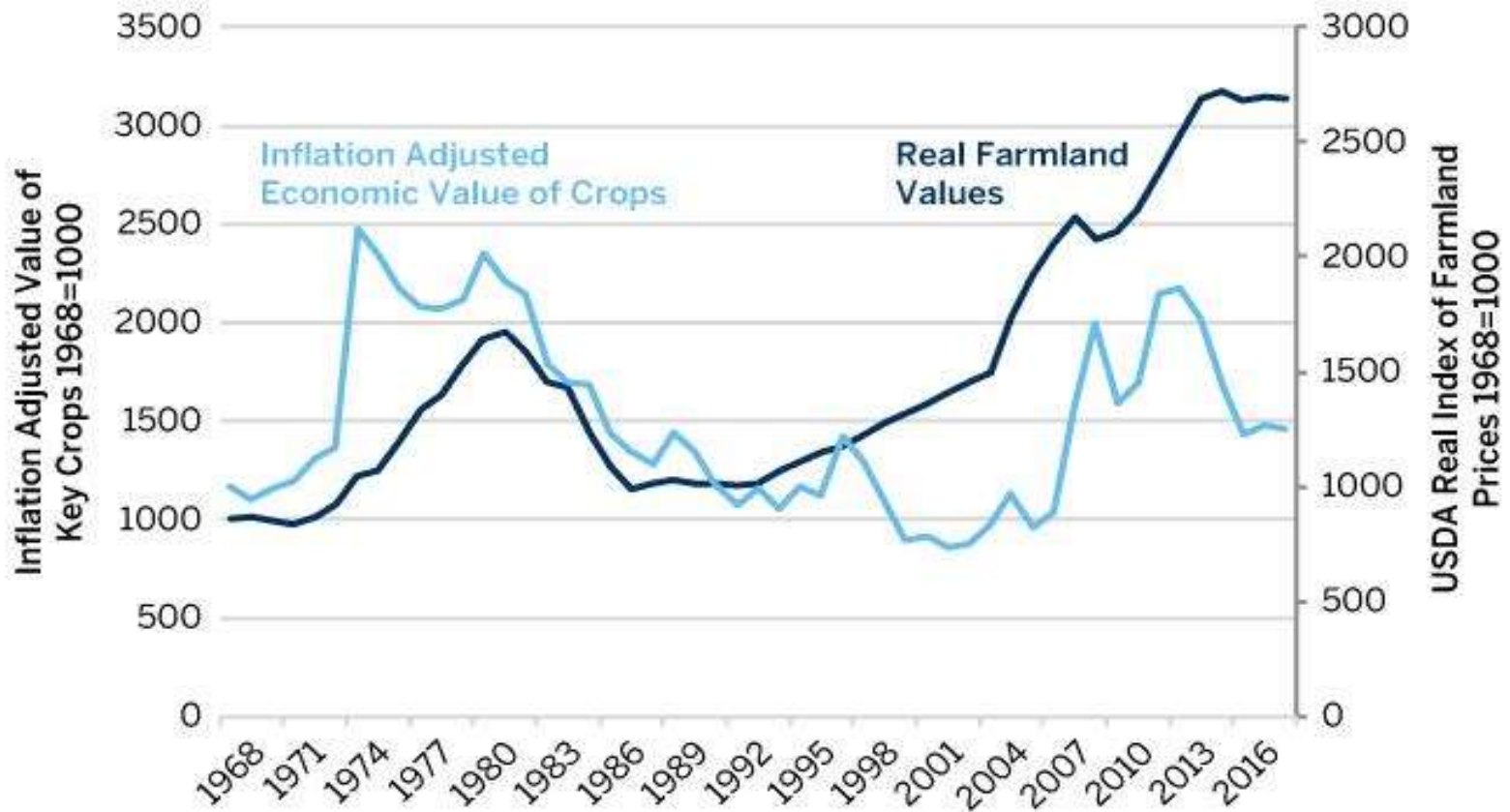➢ Selling Land prices – similar to expected economical gains with land;

Land prices: a Post Keynesian proposition

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Real Price of Farm Land

Source: USDA, Economic Research Service, WASDE and Bloomberg Professional (C 1, S 1, W 1, CPI Index)

Land Prices and Markets

- land prices are determinate by double land aspects: a) as capital asset and b) as liquid asset.

- As capital asset land does not have a fix-price market (as most capital assets), because it cannot be produced.

- As landowners speculate over the future prices of their stocks of land, selling when they think is the best moment, land is traded in a flex-price market.
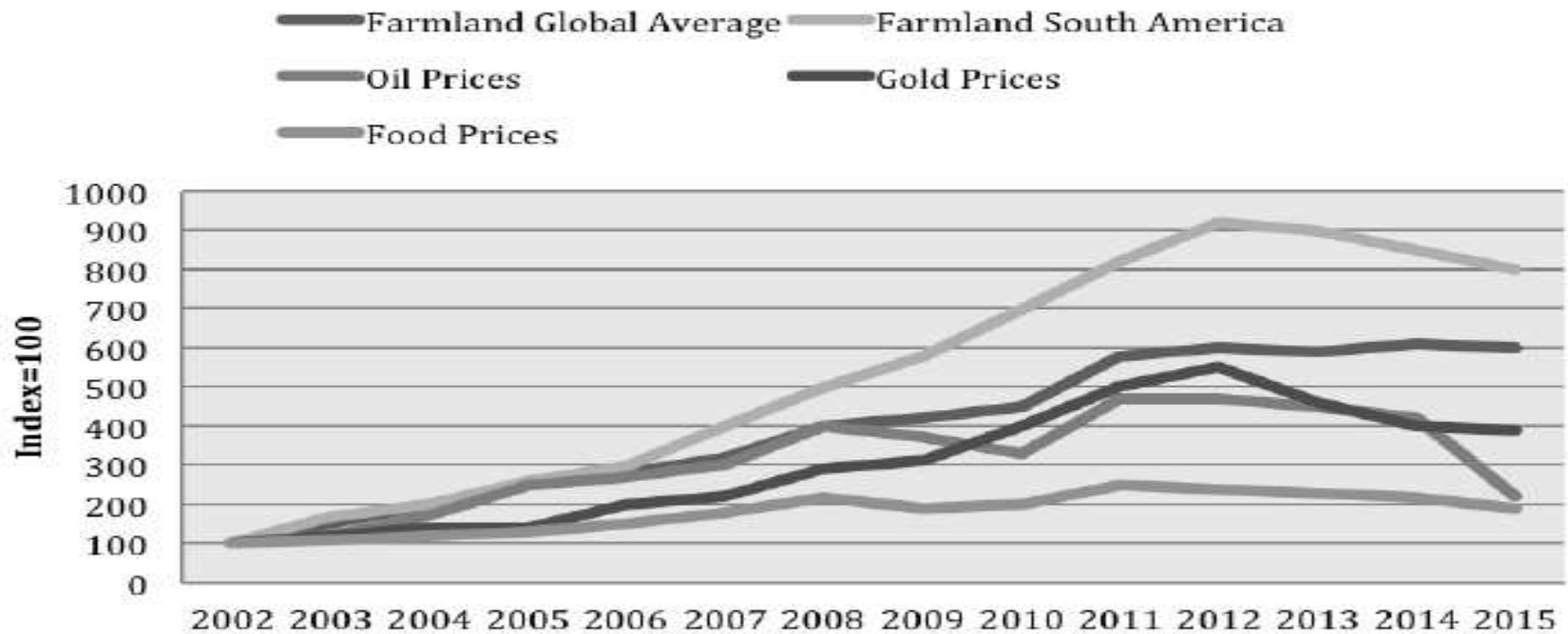
Land Markets analysis

- Land markets - regions or areas where land is being traded.

- Land is bought and sold because buyers think a property will yield a better global return than other assets.

- Local land price reflects:

✓ a) macro tendencies and

✓ b) local conditions (can capsize tendency);

Graph 3

Source: Savills Research.

http://www.savills.co.uk/research_articles/141557/204108-0

Land valuation – techniques and challenges

Valuation

- methodologies to determine the value of real estate (land or buildings).

- different purposes: for transactions, monitor the trends on the (agricultural) land market, housing market, etc.,

- a systematic valuation of multiple parcels in a project, for taxation of land/real estate etc.

Valuation Theory

- **Market value**
  - The most probable price of a property on the open market
  - Used in most cases

- **Net income value**
  - The present value of future yearly net income
  - Used e.g. for
    - investment decisions
    - market simulation

- **Cost value**
  - Replacement costs minus depreciation
  - Used e.g. for
    - insurance compensation
    - market simulation

Bandend system of Land valuation

Countries use the Banded system with:

a. the absence of funds to pay for a more complex system;

b. the need for a system that would be broadly acceptable to the taxpaying public;

c. the absence of up-to-date sales data and therefore an inability to produce an 'ad valorem´ tax base;

d. the absence of a complete register of landowners; the need for a speedy introduction of a tax system.

Elements for a banded system

1. the range covered by the bands (which should reflect the range of *'values'* of the real estate within the jurisdiction);

2. the number of value Bands and linked to that the Band widths (the fewer the bands, the wider the *'value'* ranges and the more tolerant they are to rough estimates of property *'values'*); and

3. the tax multiplier (or tax ratio) per Band or the tax rate (%) per band.

Monitoring Land Markets – The Dutch Kadaster

Dutch system of Key Registers
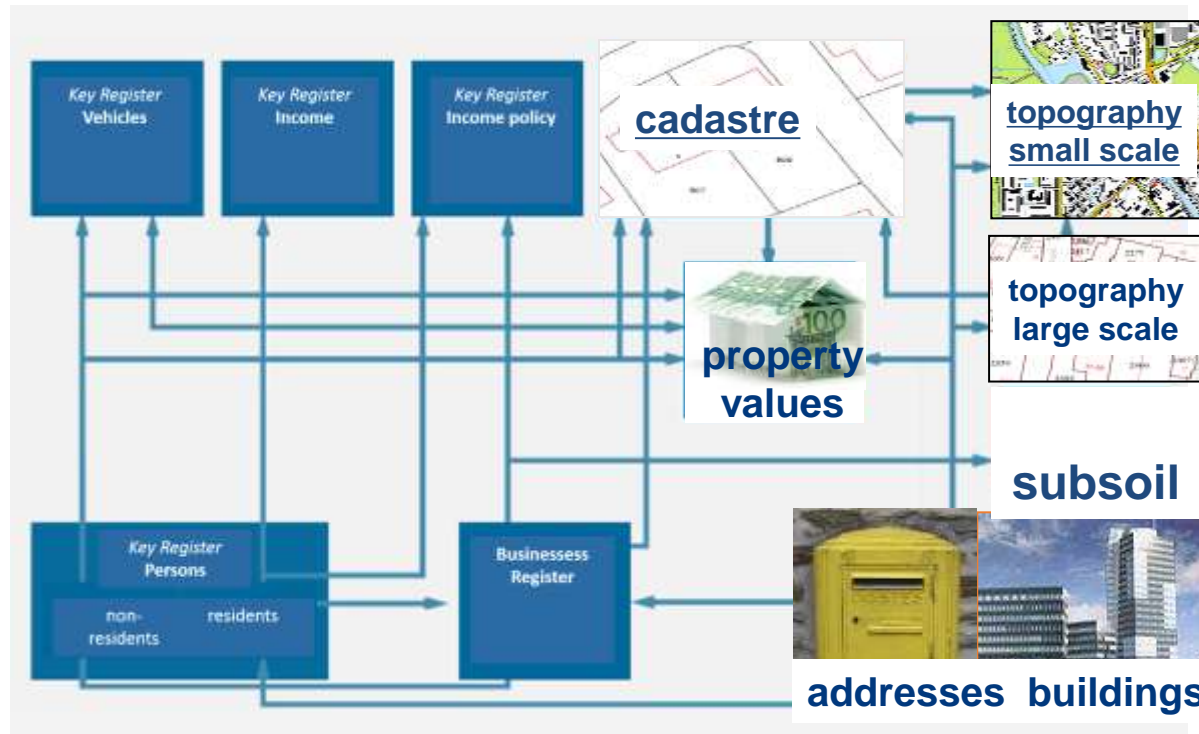
SDI developments in the Netherlands are strongly related to the key registries of e-government policy (interrelated system).

Spatial key registries with Legal Acts for:
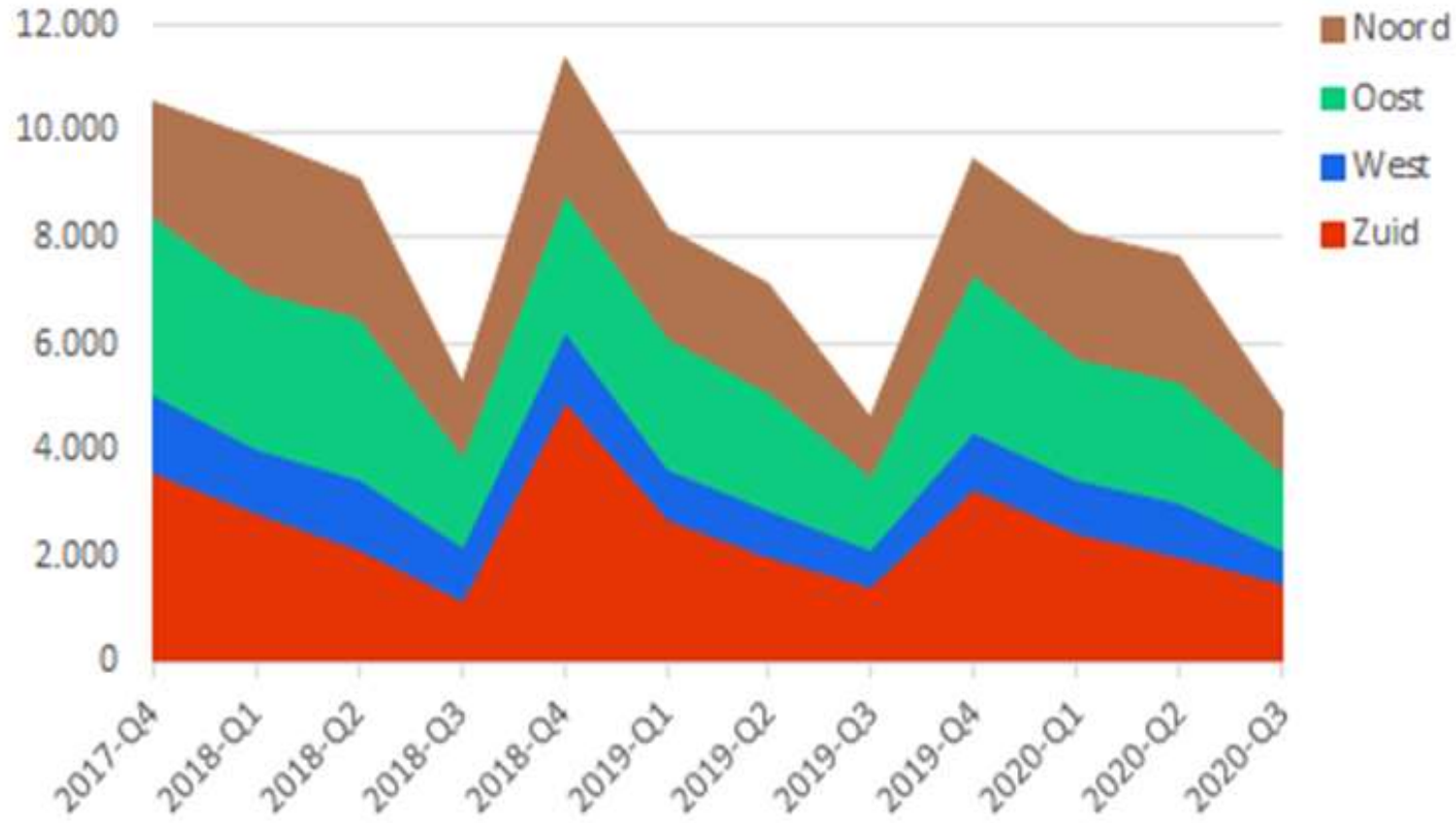**BRK** – Cadastre
BRT - Topography
BGT – Large scale Topography
BAG - Addresses and Buildings
BRO – Soil and Geology
NHR – Chamber of commerce
WOZ - Real estate value

Non-spatial registries, like population, car license plates, income.

Figure – Land mobility of agricultural land (in ha) per region between 2017 – 2020 (source: Kadaster/RVO/Wageningen Economic Research

Figure – Price (in €/ha) of unleased land for arable land, grassland, and total (arable, grass, silage maize) between 2017 – 2020 (source: Kadaster/RVO/Wageningen Economic Research

Figure 5 – Land price surveyors for land and water in Q2 2021 (Source: Kadaster /RVO/Wageningen Economic Research)
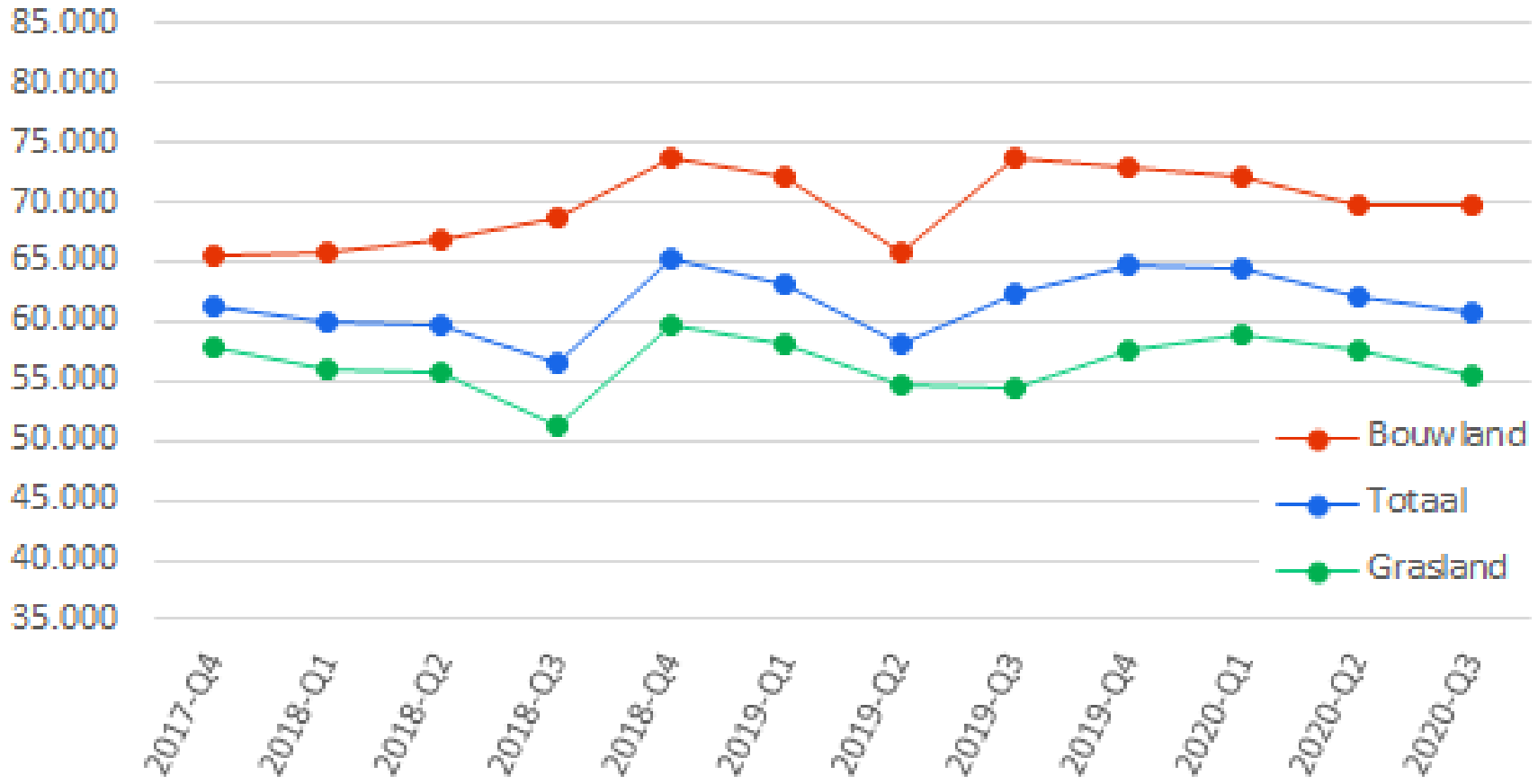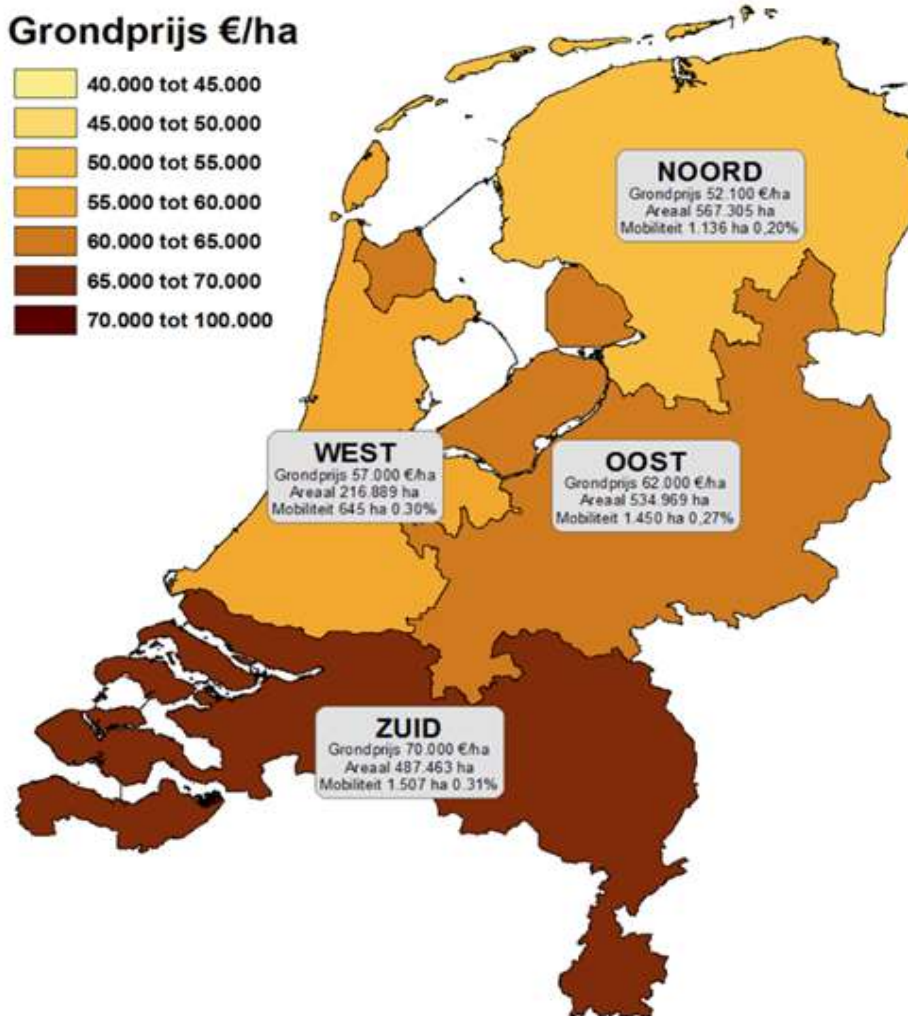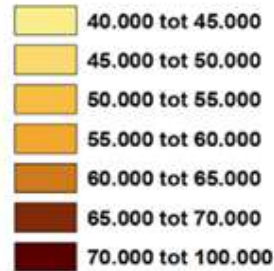
Hedonic prices for market value estimation: an Brazilian example

- Statistical Method used to estimate land prices based on a land trading sample that occurred recently.
- A deals cadastre is necessary to select a sample of buyers to apply a questionary;
- The price will be associated to relevant variables;

- PRICEt = a0 + a1X1t + a2X2t + ... + anXnt   I = 1, 2, ...k. t = 1,2,...n

PRICEt = Negotiated price per hectare. This variable can refer to the current price (PCTE) or the real market price (PREAL).
Xi: represents the relevant variables that explain the variation of rural land price in the specific market.

Figure 6 – Mesorregião Leste Maranhense 211: Geographic distribution of sampled municipalities

Table 2 – Maranhão homogeneous zone 211: Description of model variables

Variable	Description	Expected signal of the estimated coefficie
Electric Power	Dummy variable which indicates the access to electric power. It takes value 1 when the farm has accessible electric power and 0 otherwise.	Positive, as besides representing benefits fro electric power itself, this variable may be a proxy of other characteristics of infra-struct which usually come together with electric power.
Improvements	Dummy variable that indicates the existence of improvements in the farm, such as barns. It takes value 1 if there are improvements in the farm and 0 otherwise.	Positive, since improvements increase production alternatives.
Rock Fragments	Dummy variable which indicates the presence of rock fragments is considered good (1) soils with no restrictions due to rocks to mechanization and bad (0) the soil with rock fragments that makes mechanization impossible.	Positive, since it is expected that the propert where rocks do not interfere in the use of mechanization has higher prices. Those in which the rock fragments make mechanizati impossible have lower prices.
Soil	Composite index which considers soil's physical properties, such as depth, texture. This index varies in a range from 10 to 100.	Positive, as soil with better physical propert allow greater land productivity and rent.
Subsistence	Dummy variable value 1 when the system of production of the property is agricultural and cattle rising related to subsistence and trade of surplus and 0 in the opposite situation.	The signal depends on the group of producti system of HZ referred.

Results regression model for homogeneous zone 211

```
Dependent: LNR$HAAT          Multiple R =   .83907609      F = 26.16827
                                   R²=   .70404868     df =    5,55
No. of cases: 61            adjusted R²=   .67714401      p =   .000000
           Standard error of estimate:   .303109987
```

	Beta	Std.Err.	B	Std.Err.	t(55)	p-level
Intercept			2.831	0.434	6.531	0.000
Rock_Fragments	0.374	0.087	0.450	0.104	4.317	0.000
Improvements	0.370	0.075	0.455	0.092	4.943	0.000
Subsistance	-0.216	0.076	-0.254	0.089	-2.852	0.006
Electric_Power	0.271	0.079	0.293	0.085	3.442	0.001
Soil	0.277	0.084	0.019	0.006	3.292	0.002

Table 3 – Maranhão homogeneous zone 211: Estimated coefficients

Figure 7 – Maranhão homogeneous zone 211: Predicted versus observed price of rural land hectare
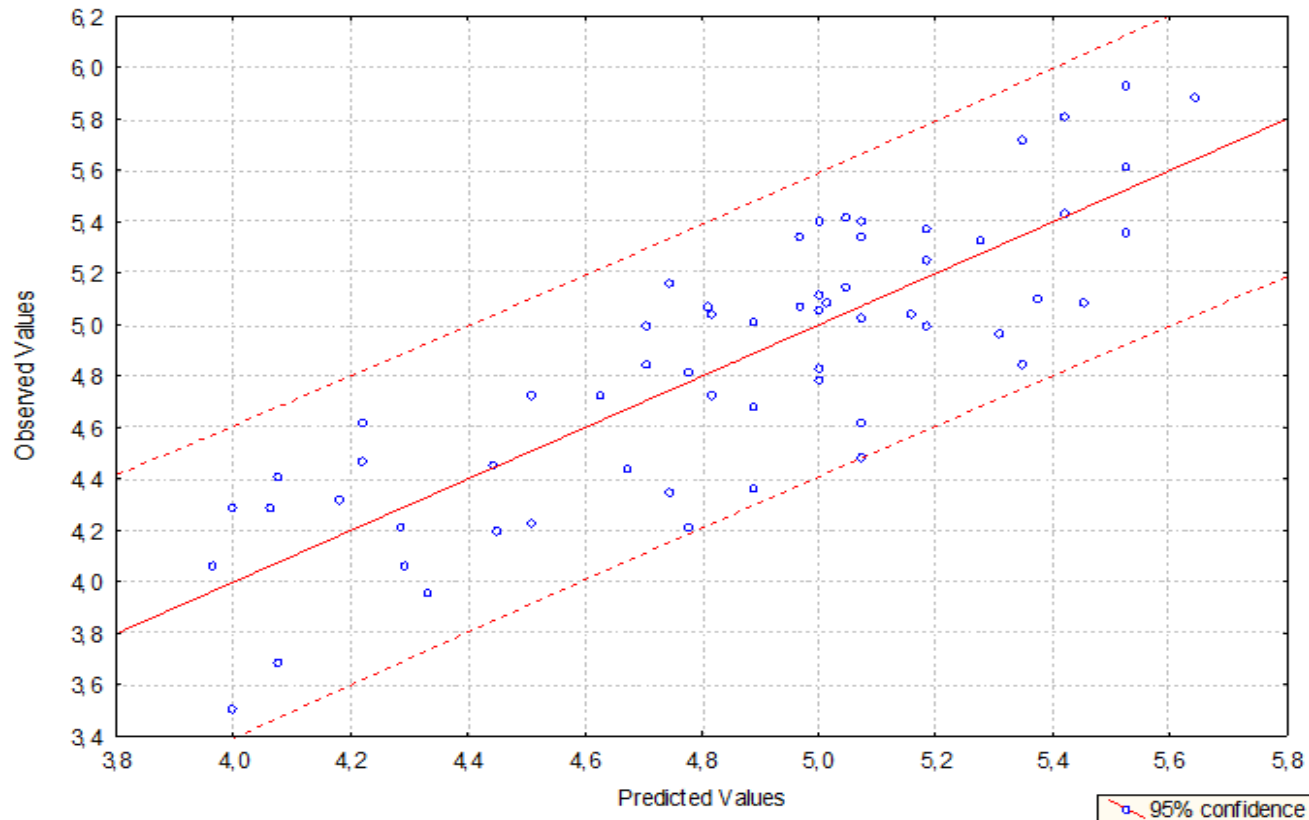
A banded valuation methodology example for land consolidation in the Netherlands

- A good system for mass valuation of land;

- Land consolidation to optimize the allocation of land for spatial developments (reducing land defragmentation, improve nature conservation, etc.)

- land consolidation - many parcels are exchanged, new parcels are formed, or parcel boundaries are adjusted, needs a systematic approach for land valuation;

- The value of all land within the area is determined based on its agronomic value, which is based on the soil type and groundwater levels (Figure 8);
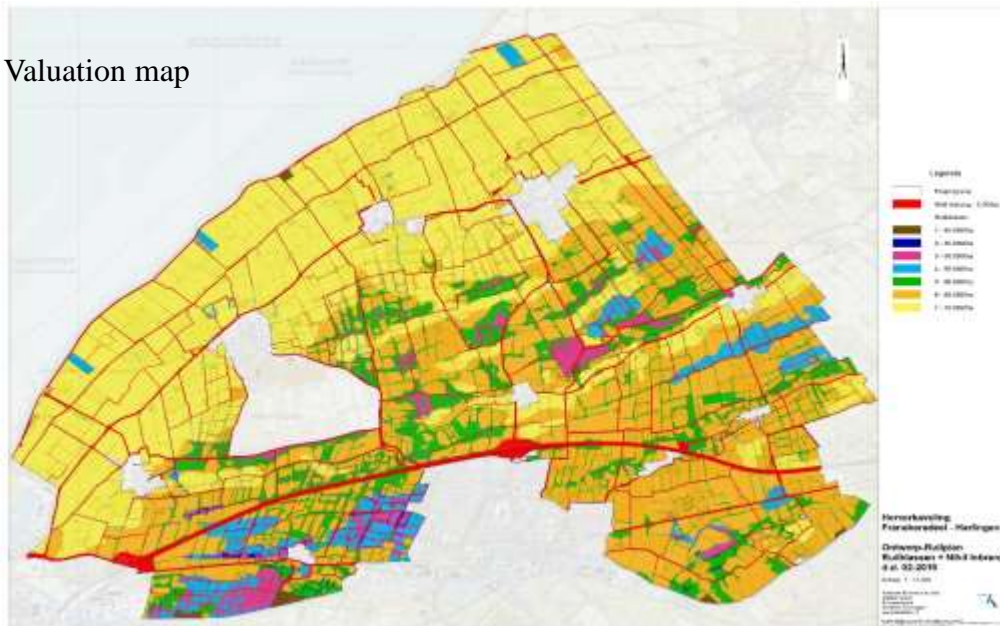
Soil map

Groundwater map

Valuation map

Final Remarks

- Good cadastres and land administration are essential for the development and regulation of land markets and prices;

- Land prices are defined in a two sided market: productive and speculative;

- Lack of good land prices information can be supplied by different mass valuations systems: banded valuation, hedonic prices, and others

- This is crucial for land administration as land scarcity is increasing;

Everything happens somewhere

Thank you for your attention

Prof. Dr. Bastiaan P. Reydon
bastiaan.reydon@kadaster.nl

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