

Climate change and adaptation – measuring regional adaptation potentials in SSE Countries

first results of the CLAVIER-project

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Conceptual framework

→ Concept of Vulnerability:

- Vulnerability = f (Exposure, Economic Sensitivity, Adaptive Capacity)
- High Regional Adaptive Capacity reduces regional Vulnerability

→ Main Idea behind:

- Regional Adaptive Capacity is the potential of a Region to “fulfill” structural change successfully
- or : the potential of regional growth – in present but also in future – defines a Regions **potential to adapt**

Theoretical Background:

→ Kaldor's growth theory

- the **manufacturing sector** is the **engine of growth** (higher productivity increases due to increasing returns to scale and can incorporate technological progress more easily, thereby inducing growth in the rest of the economy)
- positive relation between **labour productivity** in the **industrial sector** and **output productivity**
- a positive **relation between** the **labour productivity of total economy** and of **manufacturing production**

Conceptual framework

→ Potential Indicators to measure regional Adaptive capacity:

- A multitude of Indicator can be found in recent Literature
- BUT: those indicators are mainly available on national level and are generally used for developing countries

Wealth - GDP per capita	Freedom of markets
Inequality – Gini coefficient	Economic diversity in the region (HH index)
Economic autonomy of the municipality	Rural population (% of total)
Economic strength General health, healthcare availability	Risk transfer mechanisms
Nutrition status	Regional Population
General education and training	Resources for research (R&D investment %GDP)
Freedom of markets	Capacity to undertake research (No. of scientists and engineers)

Choice of variables

- To identify the “structural characteristic” of the Regions.
- according to its spatial and economic endowments.
- **Limiting factor: data-availability on NUTS 3 level:**
 - Mainly Eurostat regional data was used
 - National data is hardly comparable
 - Some indicators had to be regionalised
- **Concentration on “performance” indicators:**
 - e.g.: population development,
 - growth rates and
 - sectoral productivity measures were created to capture the potential of regional growth

Choice of variables

→ Cluster analysis of 90 NUTS 3 Regions

- Variables chosen:

- Regionalized Population Projections 2025
- Education Level [ISCED3_6] in relation to the Clavier Average
- Growth rate of Regional GDP per habitant/pps 2001-05
- Ratio of Regional GDP per habitant/pps in terms of national average
- Sectoral Employment Shares
- Regional Employment Shares
- Sectoral Value Added Shares
- Sectoral Productivity Indicators
- Accessibility indicators
- Herfindahl-Hirschman Index [concentration index] of EUROSTAT Aggregates regional employment shares (a_b; c_e; f; g_h_i; j_k; l_to_p)

→ First step: principal component analysis

- Extraction of 5 components
 - Agricultural Factor
 - Tertiary Employment Factor
 - Industrialization Factor
 - Growth/Disparity Factor
 - Population Factor

principal component analysis

	Agricultural Factor	Industrialization Factor	Tertiary Employment Factor	Growth/Disparity Factor	Population Factor
ACEMP	0.09	-0.10	0.86	-0.06	0.05
PopProj25	-0.02	0.05	0.09	0.05	0.93
ISCED3_6	-0.07	0.73	-0.09	-0.28	-0.29
Beds_kHab	-0.24	0.04	0.82	0.06	0.05
dpps_h05_01	0.13	0.02	-0.14	0.89	0.08
Spps_h_Nat05	0.00	0.59	0.28	0.65	0.00
EMP_P_04	0.751	-0.104	0.144	0.309	-0.196
vadS04c_to_f	0.16	0.84	-0.07	0.29	0.29
vadS04g_to_p	-0.72	-0.27	0.39	-0.20	-0.06
IP04IN	0.87	0.10	0.10	-0.02	0.17
IP04DL	0.63	-0.59	-0.32	0.04	-0.11
HHI	0.78	-0.39	-0.15	-0.30	0.02
empS04c_f	-0.47	0.70	-0.13	0.26	0.17
empS04g_p	-0.76	0.27	0.47	-0.22	0.15

principal component analysis

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- **Pure agricultural Regions (n=9)**

→ **Employment Shares:**

Agriculture: mean 58.93

Secondary Sector: mean 18.10

Services: mean 22.97

→ **Value Added Shares:**

Agriculture: mean 28.79


Secondary Sector: mean 28.52

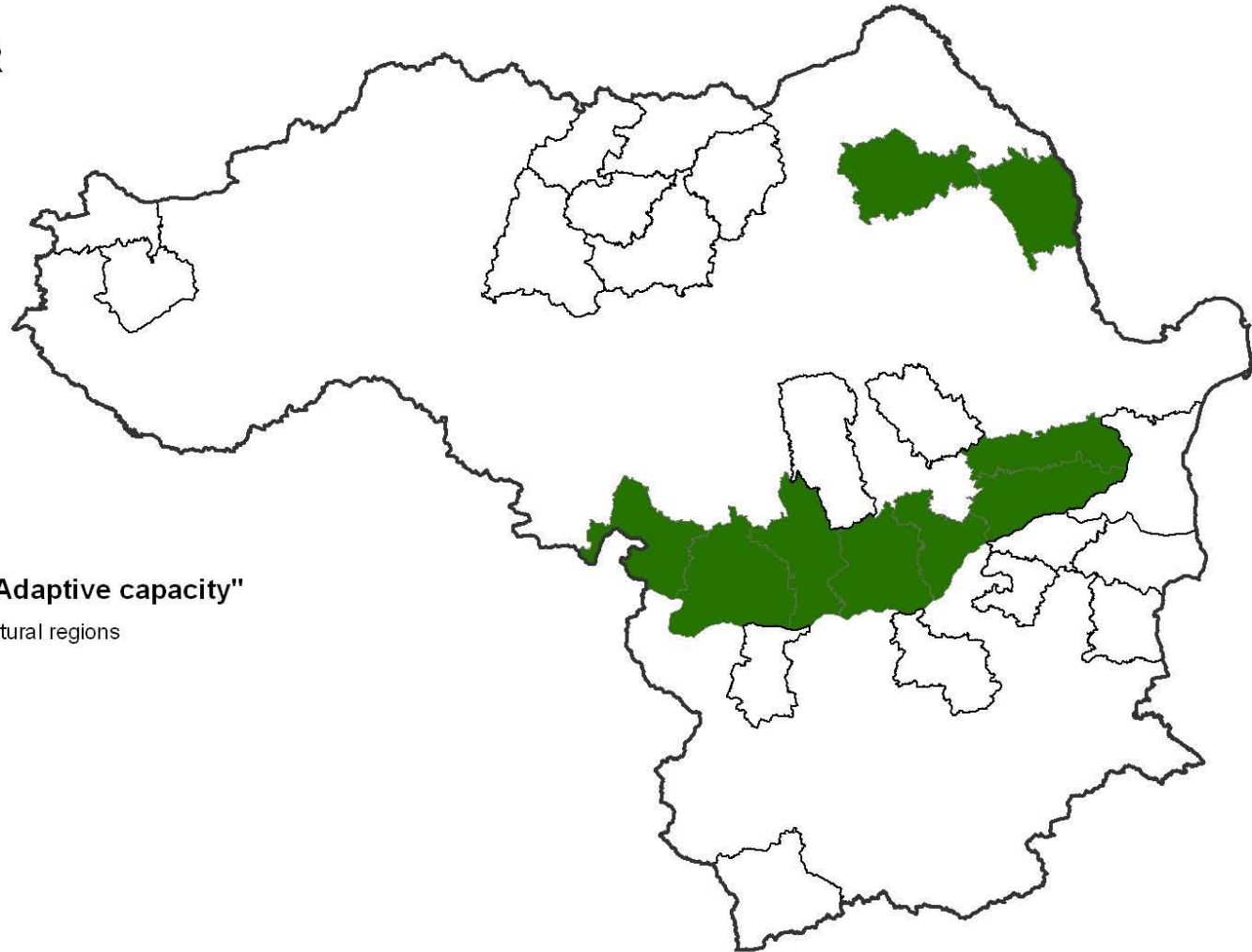
Services: mean 42.69

- Regional GDP/hab: average (national)
- Growth of regional GDP: above average
- Accessibility index: below average
- Herfindahl-Hirschman Index [concentration index] is extremely high (HHI= 0.257)
- Unproductive agricultural sector, missing industrial base, no tourism

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Clustering "Adaptive capacity"

 pure agricultural regions



- **Predominately agricultural Regions (n=15)**

→ **Employment Shares:**

Agriculture: mean 40.32

Secondary Sector: mean 28.26

Services: mean 31.41

→ **Value Added Shares:**

Agriculture: mean 21.80



Secondary Sector: mean 31.15

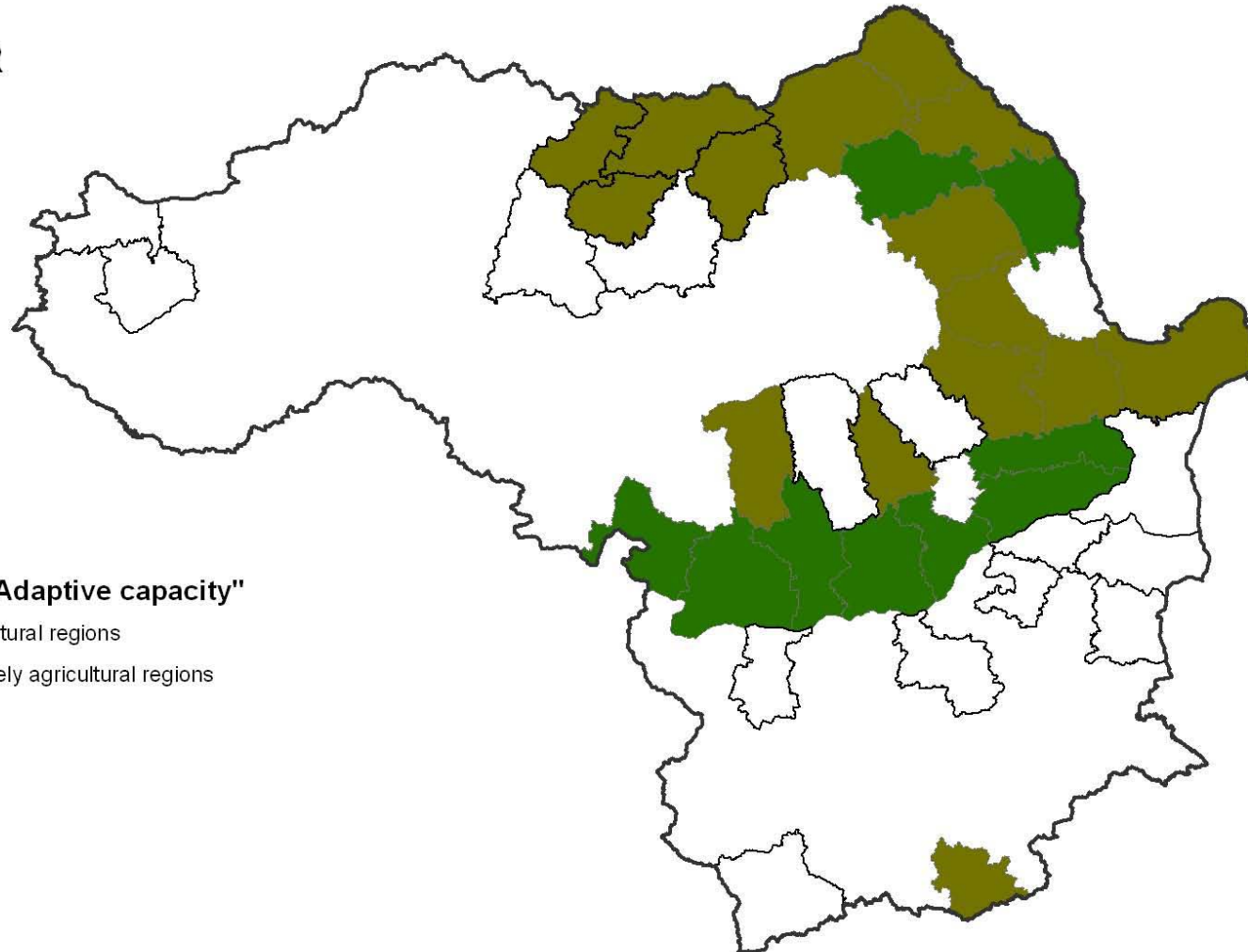
Services: mean 47.05

- Regional GDP/hab: below average (national)
- Growth of regional GDP: high (above average)
- Accessibility index: very low, medium pop_dens
- HHI [concentration index] is high (HHI= 0.135)
- unproductive agricultural sector, but an existing **industrial base**, little tourism.
- But: extremely stable population and highest regional participation rates.

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Clustering "Adaptive capacity"

-  pure agricultural regions
-  predominately agricultural regions



• Rural Service Regions (n=18)

→ Employment Shares:

Agriculture: mean 34.27

Secondary Sector: mean 24.95

Services: mean 40.78

→ Value Added Shares:

Agriculture: mean 21.11

Secondary Sector: mean 22.72

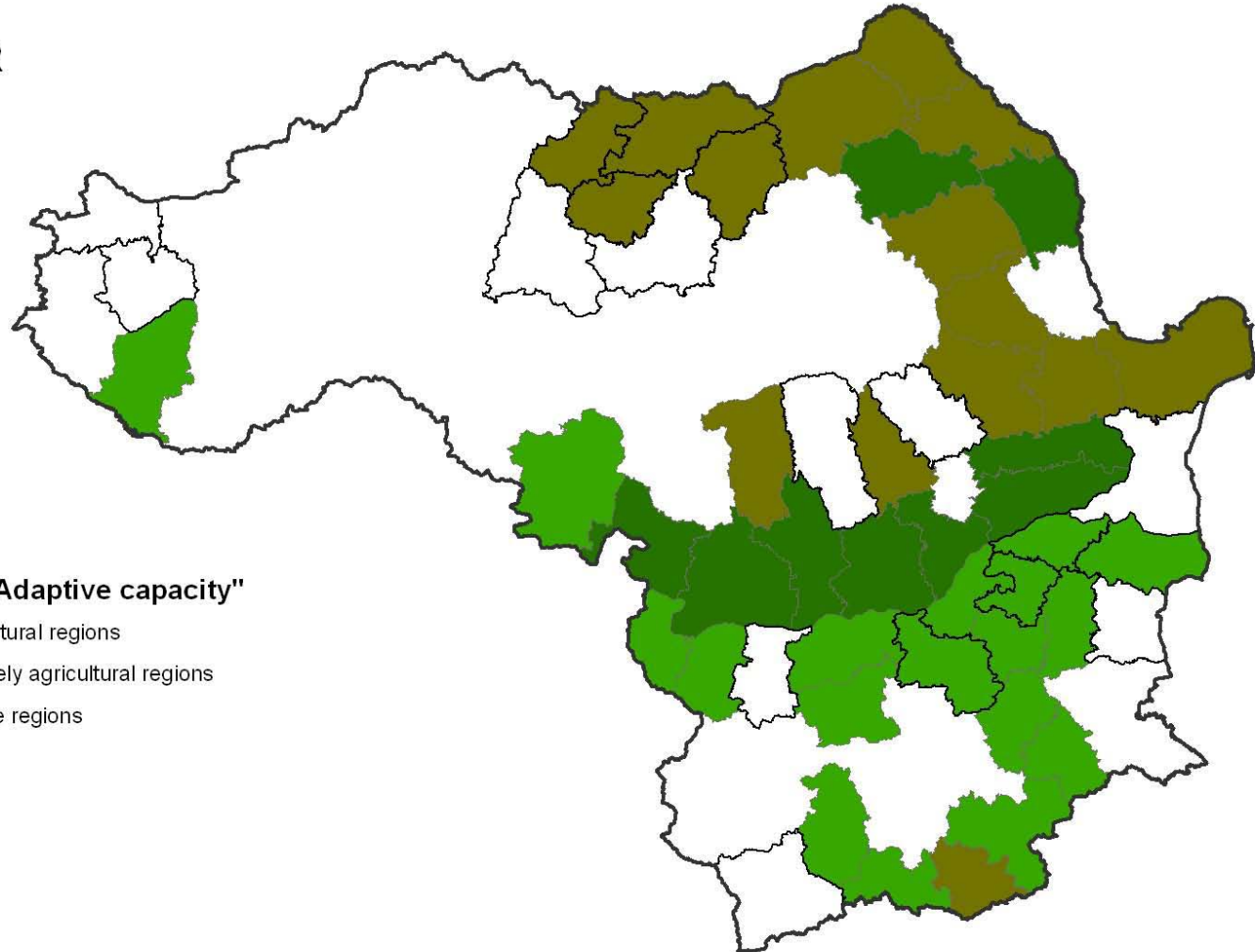
Services: mean 56.17

- Sparsely populated and accessible
- Regional GDP/hab: below average (national) as well as low growth of regional GDP
- Depopulating
- Relative unproductive secondary sector, touristic capacity below average, but intense in some regions
- Relative diverse sectoral concentration, (HHI is under average)

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Clustering "Adaptive capacity"

- pure agricultural regions
- predominately agricultural regions
- rural service regions



- **Depopulated Regions (n=5)**

→ **Employment Shares:**

Agriculture: mean 31.06

Secondary Sector: mean 31.56

Services: mean 37.38

→ **Value Added Shares:**

Agriculture: mean 13.99

Secondary Sector: mean 41.23

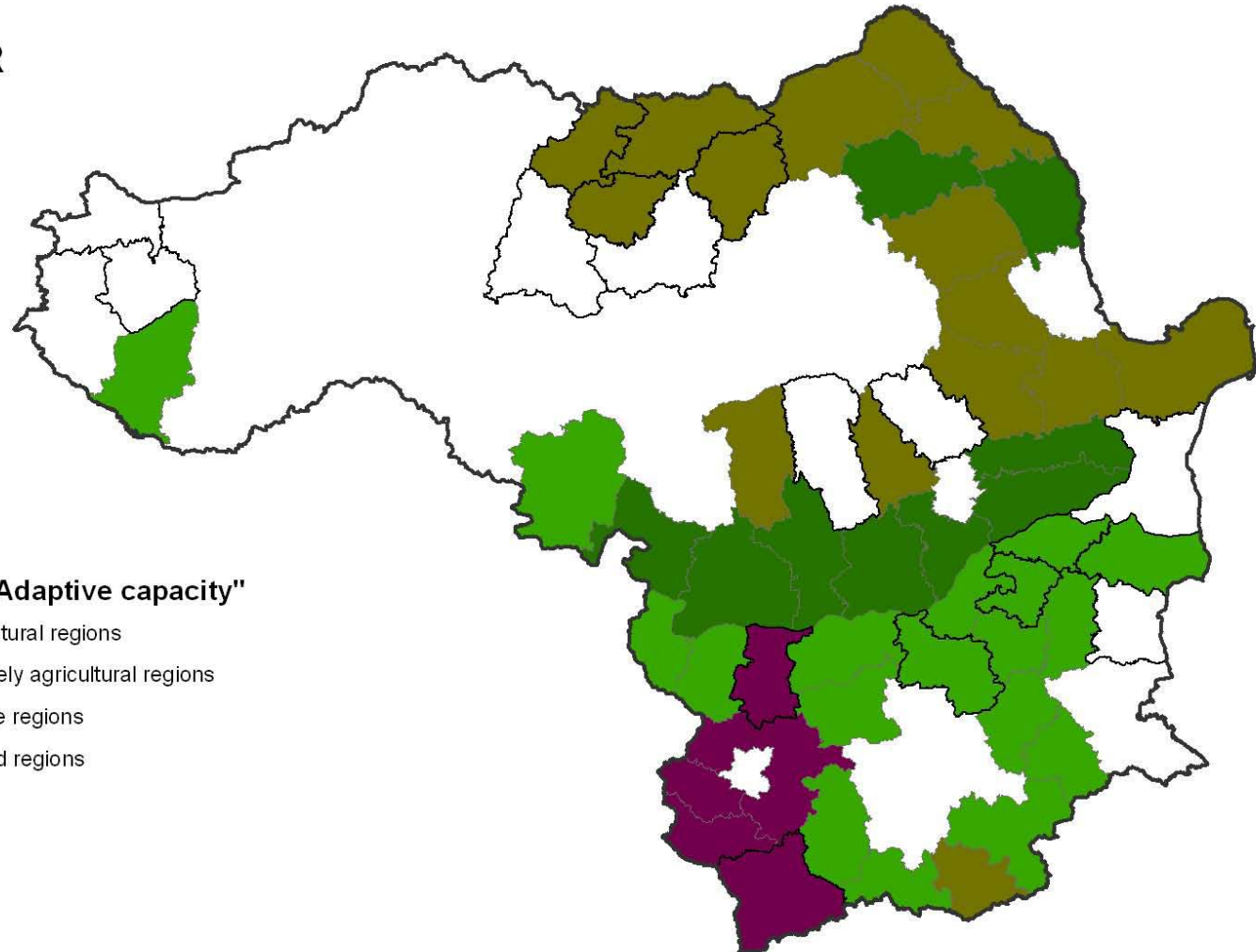
Services: mean 44.78

- Sparsely populated
- Population Projections 2025 (2001=100): mean 66
- Low participation rates, sparsely populated - even now
- Low regional GDP, non- accessible

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Clustering "Adaptive capacity"

- pure agricultural regions
- predominately agricultural regions
- rural service regions
- depopulated regions



- **Industrial Regions (n=17)**

→ **Employment Shares:**

Agriculture: mean 21.63

Secondary Sector: mean 39.86

Services: mean 38.51

→ **Value Added Shares:**

Agriculture: mean 13.53

Secondary Sector: mean 39.07

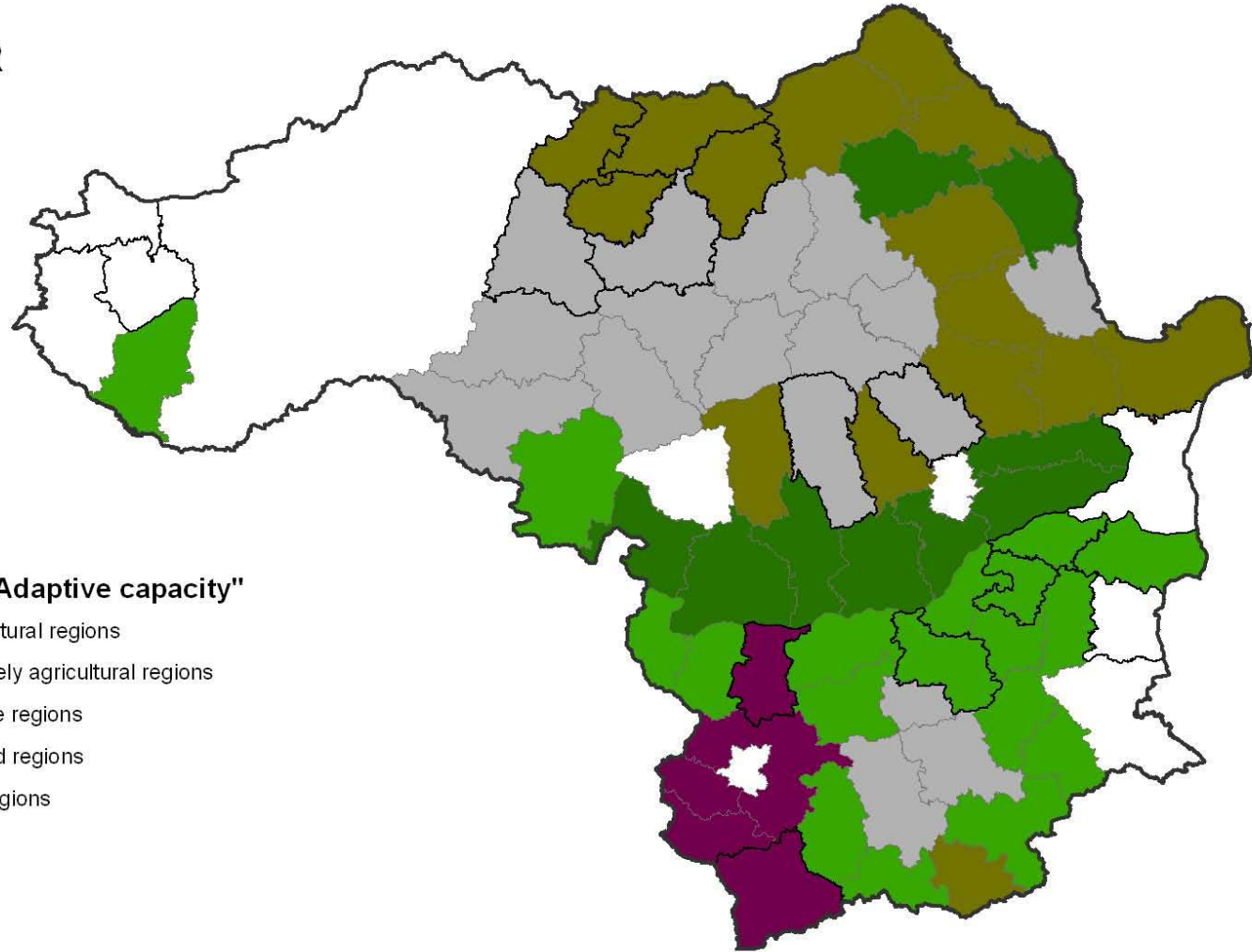
Services: mean 47.41

- Regional GDP/hab: above national average
- Rapidly growing regional GDP
- Low Accessibility but
- relative densely populated
- Diverse Economy: Herfindahl-Hirschman Index [concentration index] is below 0.1

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Clustering "Adaptive capacity"

- pure agricultural regions
- predominately agricultural regions
- rural service regions
- depopulated regions
- industrial regions



- **Industrial Centres (n=8)**

→ **Employment Shares:**

Agriculture: mean 9.86

Secondary Sector: mean 40.64

Services: mean 49.50

→ **Value Added Shares:**

Agriculture: mean 6.80

Secondary Sector: mean 43.55

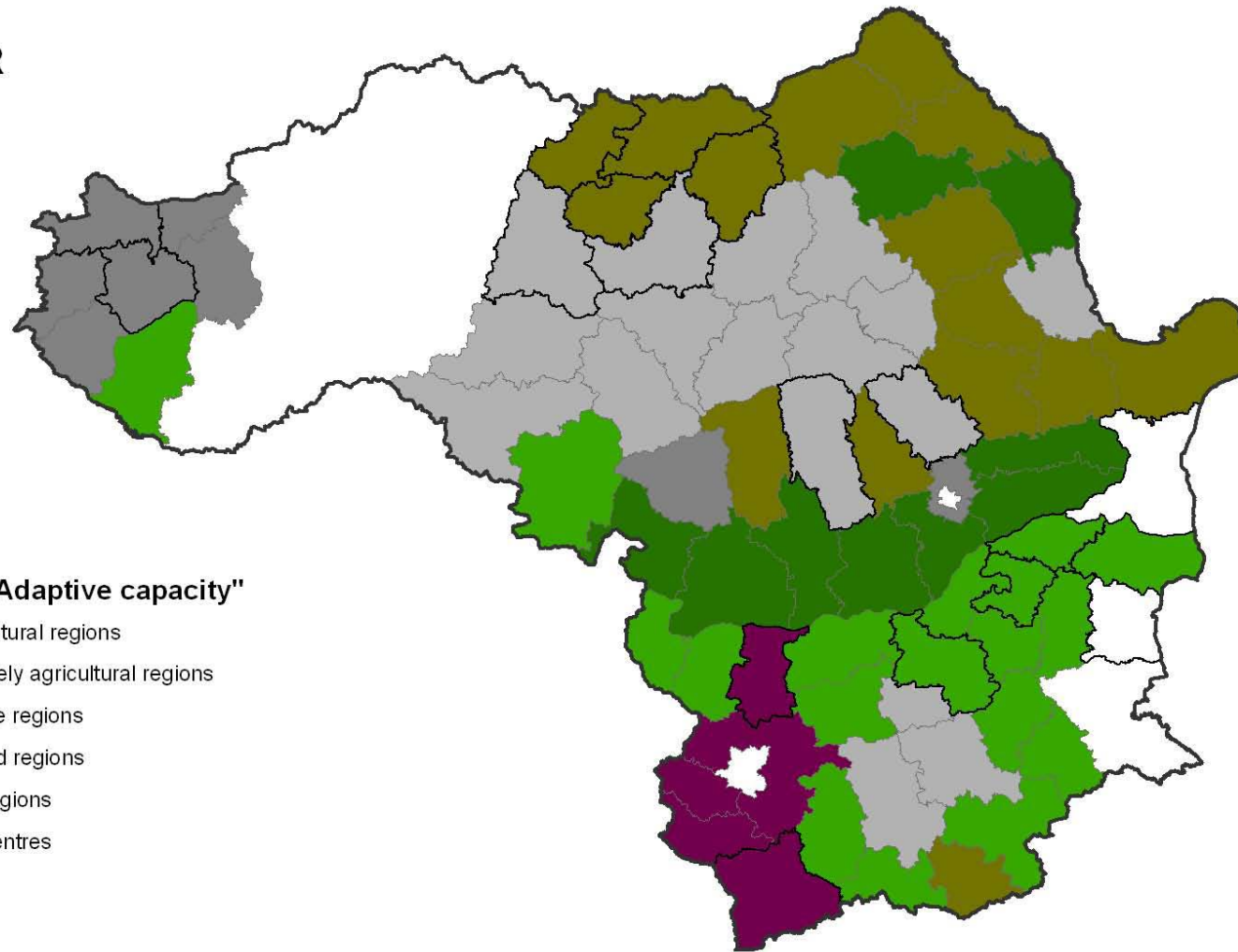
Services: mean 49.65

- Regional GDP/hab: above national average
- High regional education level
- Accessible and
- densely populated (more than 100 hab/km²)
- Diverse Economy, by having a productive secondary sector
- Touristic capacities in the Hungarian regions (by having a relative unproductive service sector)

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Clustering "Adaptive capacity"

- pure agricultural regions
- predominately agricultural regions
- rural service regions
- depopulated regions
- industrial regions
- industrial centres



- **Tourist Centres C (n=3)**

→ **Employment Shares:**

Agriculture: mean 20.77

Secondary Sector: mean 24.48

Services: mean 54.75

→ **Value Added Shares:**

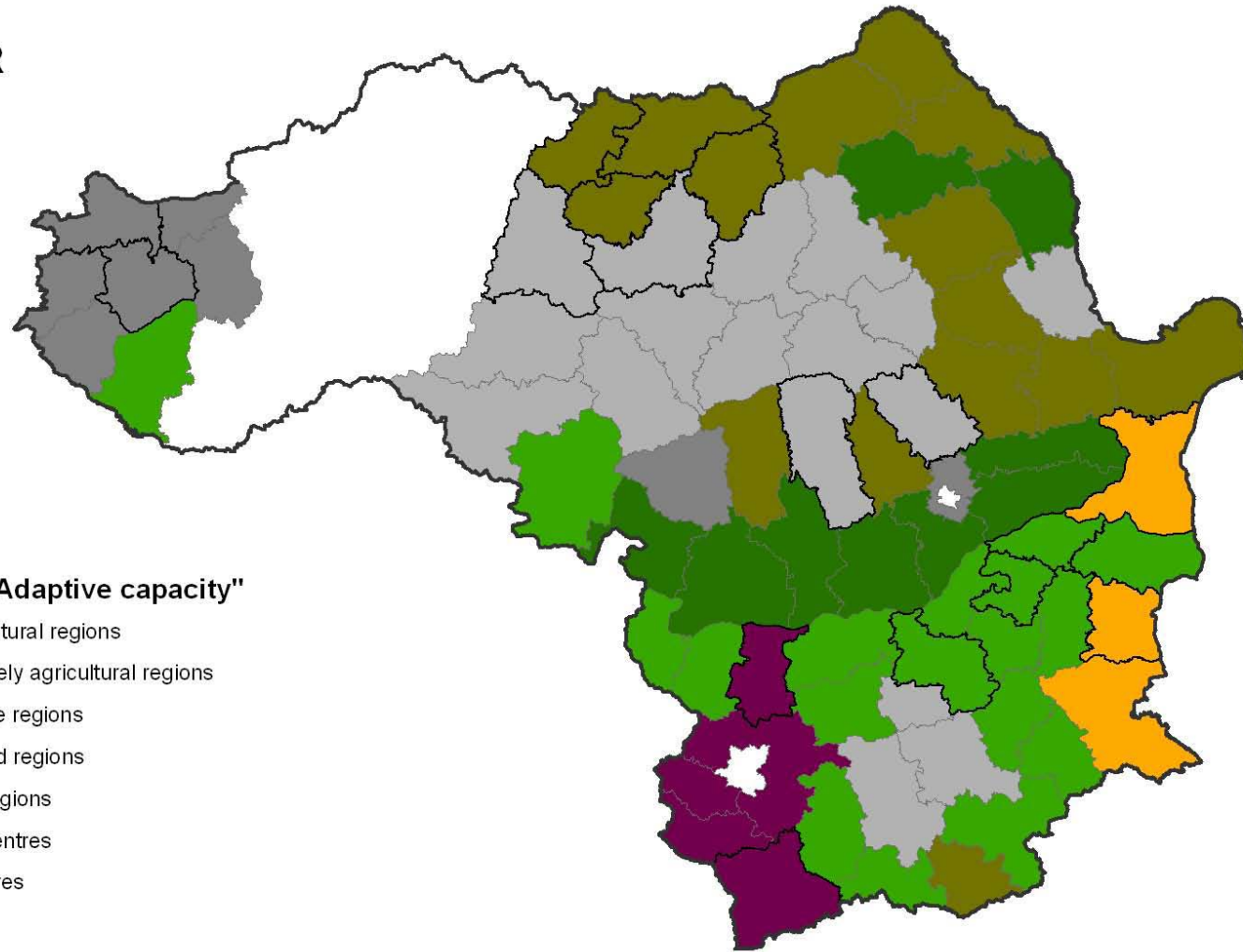
Agriculture: mean 8.44

Secondary Sector: mean 32.33

Services: mean 59.23

- Regional
- Most accessible regions
- Fast growing regions GDP (regional is GDP above average)
- A stable population (mean 89.2)
- Number of beds per 1000 habitants is 180 (mean)
- Service driven economy and a productive industrial base

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Clustering "Adaptive capacity"

- pure agricultural regions
- predominately agricultural regions
- rural service regions
- depopulated regions
- industrial regions
- industrial centres
- tourist centres

- **Service Regions (n=12)**

→ **Employment Shares:**

Agriculture: mean 7.49

Secondary Sector: mean 34.73

Services: mean 57.78

→ **Value Added Shares:**

Agriculture: mean 8.75

Secondary Sector: mean 32.33

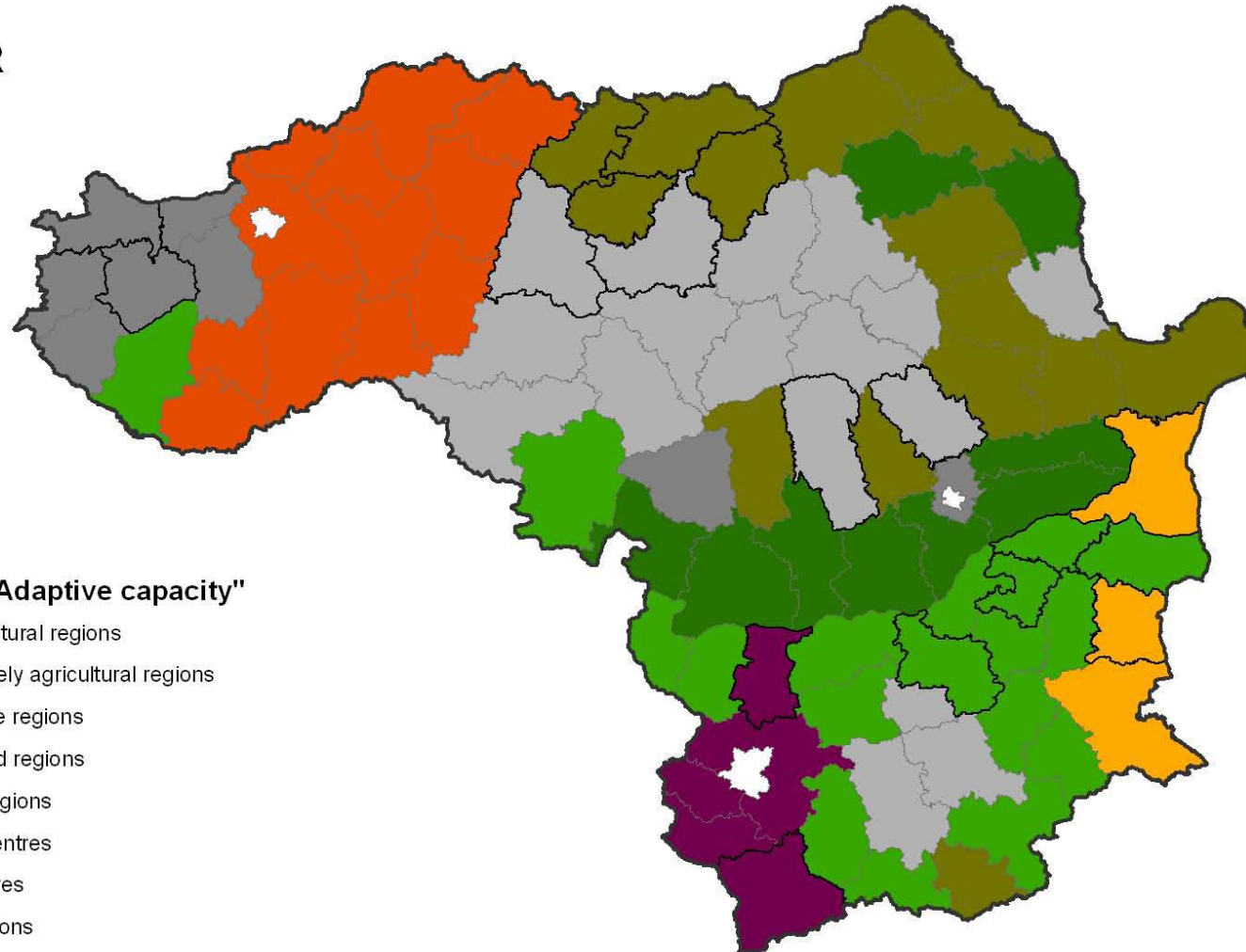
Services: mean 59.23

- The sample represents the Hungarian service regions
- A small and productive agriculture
- A diverse economy and stable growth rates
- A very stable population (mean 93)
- High participation rates

CLAVIER

Clustering "Adaptive capacity"

- pure agricultural regions
- predominately agricultural regions
- rural service regions
- depopulated regions
- industrial regions
- industrial centres
- tourist centres
- service regions

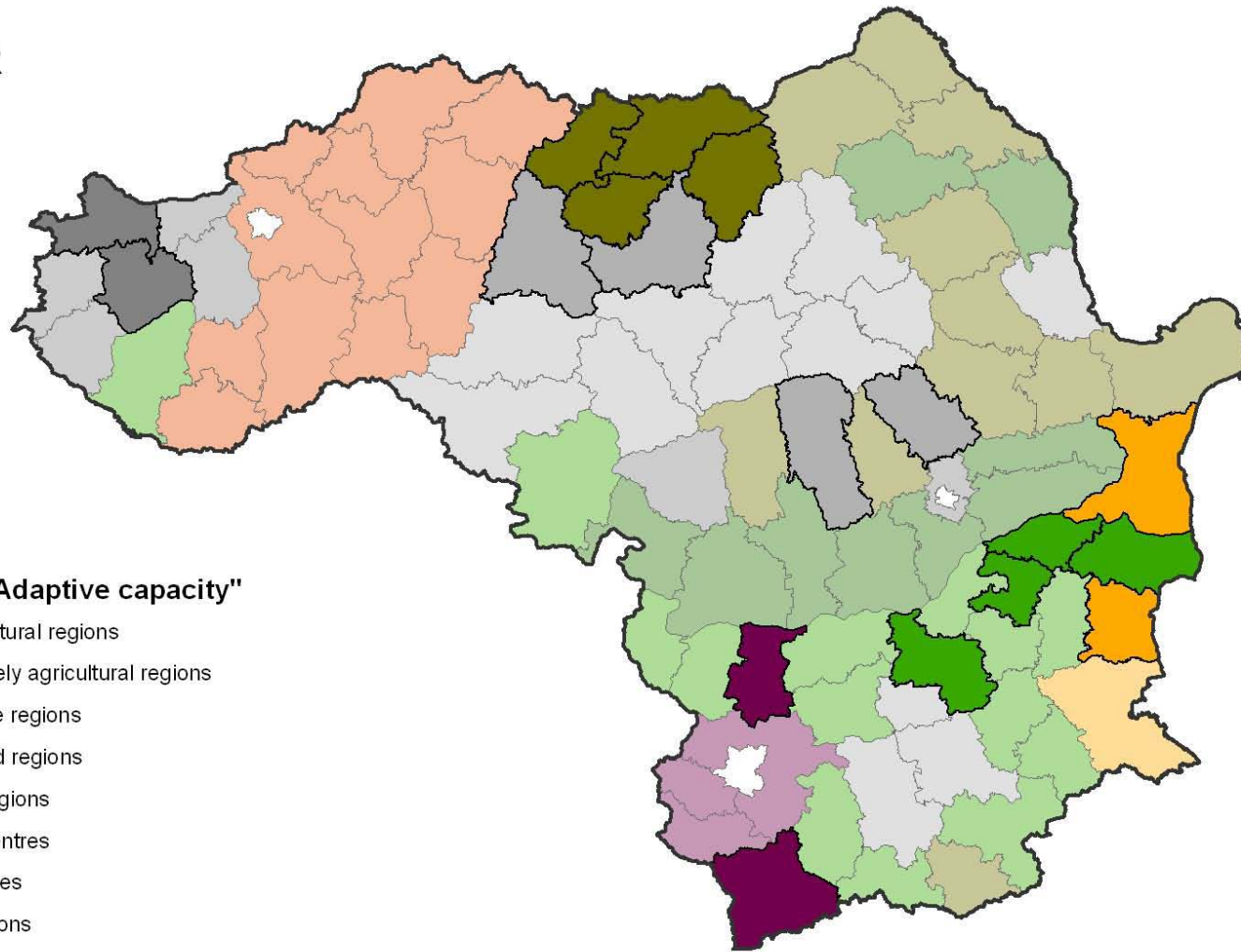


Limitation

- Results do only compare regions with other regions of BG, RO and HU
- Data availability

Thank you for your attention

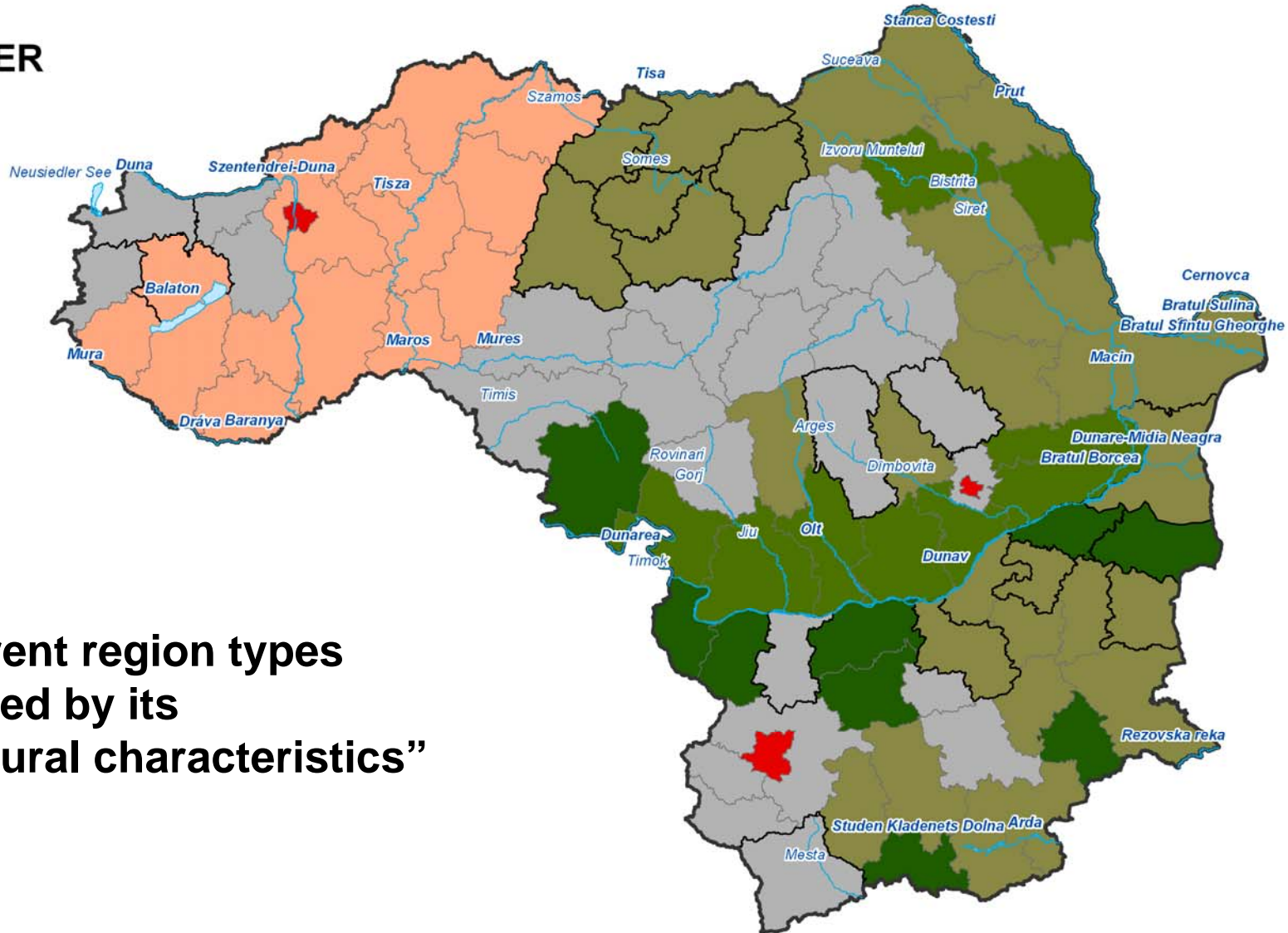
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Clustering "Adaptive capacity"

-  pure agricultural regions
-  predominately agricultural regions
-  rural service regions
-  depopulated regions
-  industrial regions
-  industrial centres
-  tourist centres
-  service regions

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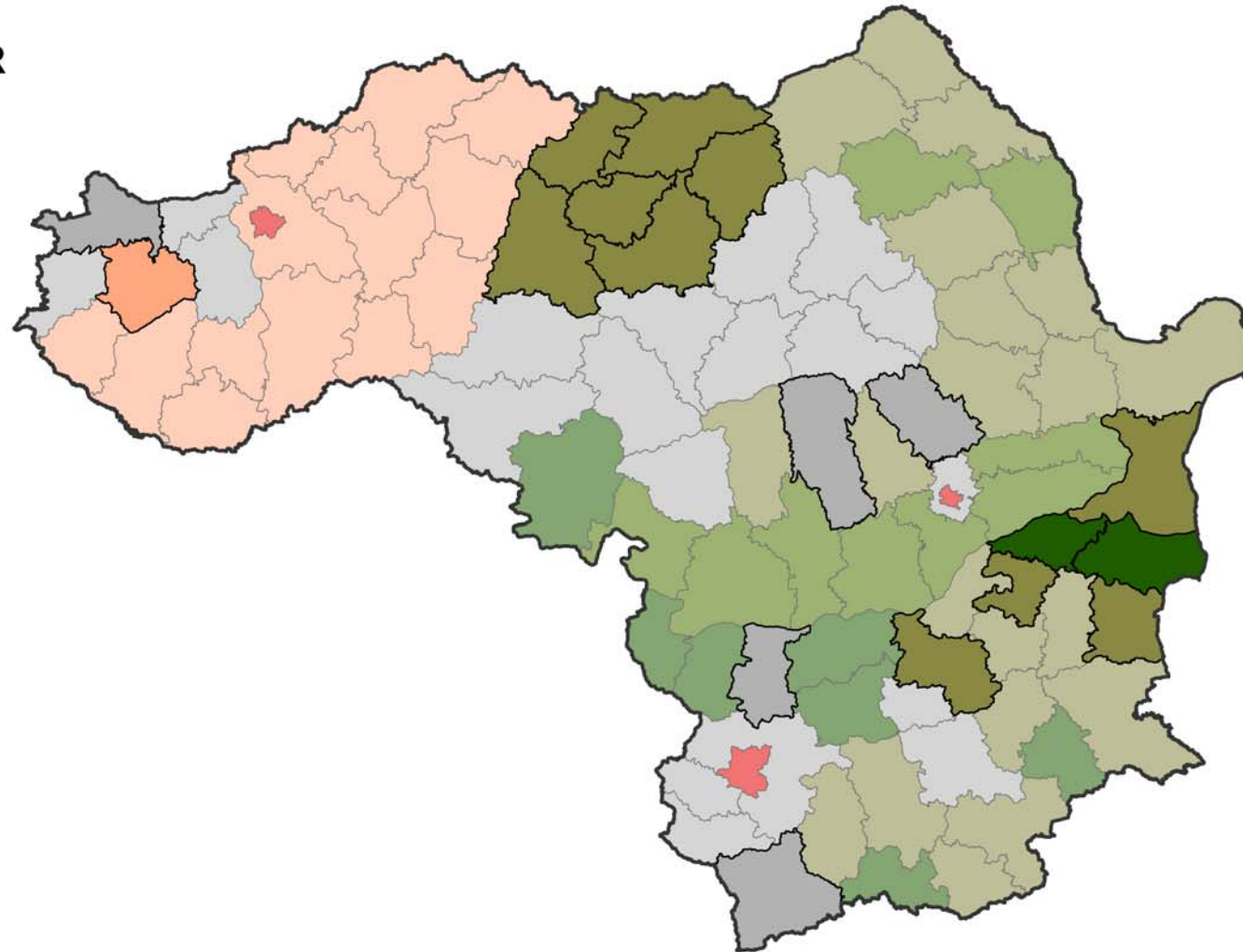


→ 6 different region types identified by its “structural characteristics”

- Clustering "Adaptive capacity"**
- metropolitan regions
 - developed service regions
 - industrial regions
 - agricultural service oriented regions
 - predominated agricultural regions
 - depopulating agricultural regions

D4.2 – The CLAVIER Regions

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- Clustering "Adaptive capacity"**
- metropolitan regions
 - developed service regions
 - industrial regions
 - agricultural service oriented regions
 - predominated agricultural regions
 - depopulating agricultural regions