Budapest University of Technology and Economics

HAVE HUNGARIAN DISTRICTS BECOME MORE RESILIENT?

A COMPARISON OF THE 2014 AND 2020 BASELINE RESILIENCE INDICATORS FOR COMMUNITIES (BRICS)

Anna Csizovszky

PhD student

csizovszky.anna@edu.bme.hu

6th September, 2023

Agenda

- General introduction

- Indicator framework

- Spatial-temporal analysis

- Key messages

Introduction

- **Numerous crisis events**

- **Proliferation of resilience**

- **Community resilience**

  The focus is on recovery from stress and access to critical resources by building local capacities
  Spatial and social perspective

- **Various indices**

  Composite assessment taking into account human health, well-being, and social, economic, and ecological resilience is beneficial

- **Research question: Have Hungarian districts become more resilient?**

Indicator framework

Baseline Resilience Indicators for Communities (BRIC)

⬡ **Theoretical foundation – DROP**

⬡ **Pre-disaster characteristics**

How robust it would be under disturbances

⬡ **Academic literature – strengths**

Reputation and credibility
Wide coverage of characteristics
Comprehensive indicator

⬡ **Applications**

- **USA** – Cutter et al. (2010, 2014)
- Sunshine Coast, **Australia** – Singh-Peterson et al. (2014)
- First European adaptation (**Norway**) – Scherzer et al. (2019)
- Yilan County (**Taiwan**) – Sung & Liaw (2020)
- Mill River Watershed (**USA**) – Saravanan & Garren (2021),
- The most current adaptation (**Iran**) – Javadpoor et al. (2021)

Covered charac-teristics

|	
SOCIAL	• general demographic characteristics • resilience of individuals
ECONOMIC	• vitality, stability and diversity of the economy • access to financial resources
COMMUNITY	• people's involvement • formal and informal safety networks
INSTITUTION	• community governance • crisis management
INFRASTRUCTURE	• quality of housing • critical infrastructure for evacuation and supply
ENVIRONMENT	• nature's absorptive capacity + agriculture • efficient resource use

Used indicators

Dimension		Indicator	
Social	S1	Working age (proportion of population aged 15-64 years)	+
	S2	Migration balance per 1000 capita	+
	S3	Natural growth rate	+
	S4	Number of marriages per 1000 capita	+
	S5	Number of residents per GPs and pediatricians	-
	S6	Cars per 1000 capita	+
	S7	Internet subscriptions per apartment	+
Economic	Ec1	Registered jobseekers per 1000 persons aged 15-64 years	-
	Ec2	Proportion of microenterprises in active enterprises	-
	Ec3	Enterprises having at least 50 employees per 1000 capita	+
	Ec4	Number of branch banks per 1000 capita	+
	Ec5	Personal income taxable income (1000 HUF) per taxpayer	+
	Ec6	Number of civic organizations per 1000 capita	+
Community	C1	Places in infant nurseries (per 1000 persons aged 0-2 years)	+
	C2	Schools (per 1000 capita)	+
	C3	Number of family and child welfare services (per 100 000 capita)	+
	C4	Total number of persons employed in basic social services and day care (per 1000 capita)	+
	C5	Proportion of settlements providing day care for the aged	+
	C6	Area of playgrounds, athletic grounds and resting places (m^2 per capita)	+
	C7	Number of cultural events per 1000 capita	+

Dimension		Indicator	
Infrastructure	I1	Number of dwellings ceased due to obsolescence or natural disasters per 1000 apartment in the previous five years	-
	I2	Proportion of dwellings connected to public water conduit network	+
	I3	Proportion of dwellings connected to public sewerage network	+
	I4	Length of public roads (km per 1000 capita)	+
	I5	Number of railway stations (per 1000 capita)	+
	I6	Time to reach the nearest city of at least 100,000 inhabitants by the fastest road (min)	-
	I7	Number of pharmacies (per 1000 capita)	+
	I8	Number of fire protection units (per 1000 capita)	+
Environmental	En1	Local government owned green areas, total (m^2 per capita)	+
	En2	Water consumption (m^3 per capita)	-
	En3	Energy consumption (kWh per capita)	-
	En4	Proportion of built-up areas (Corine 11, 12, 13)	-
	En5	Proportion of natural areas (Corine 31, 32, 41, 42, 51)	+

Social and economic dimensions

2014

2020

Social
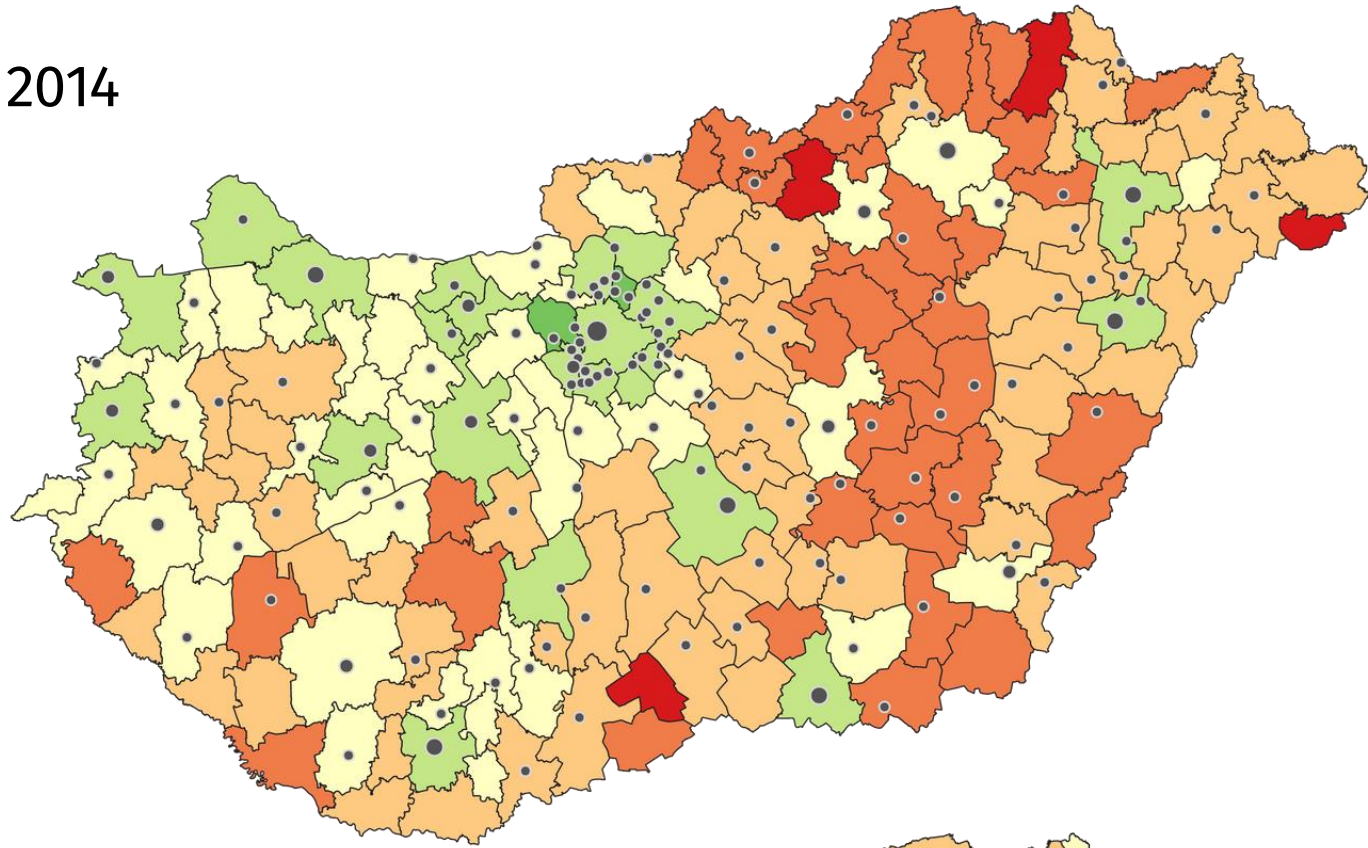
2014
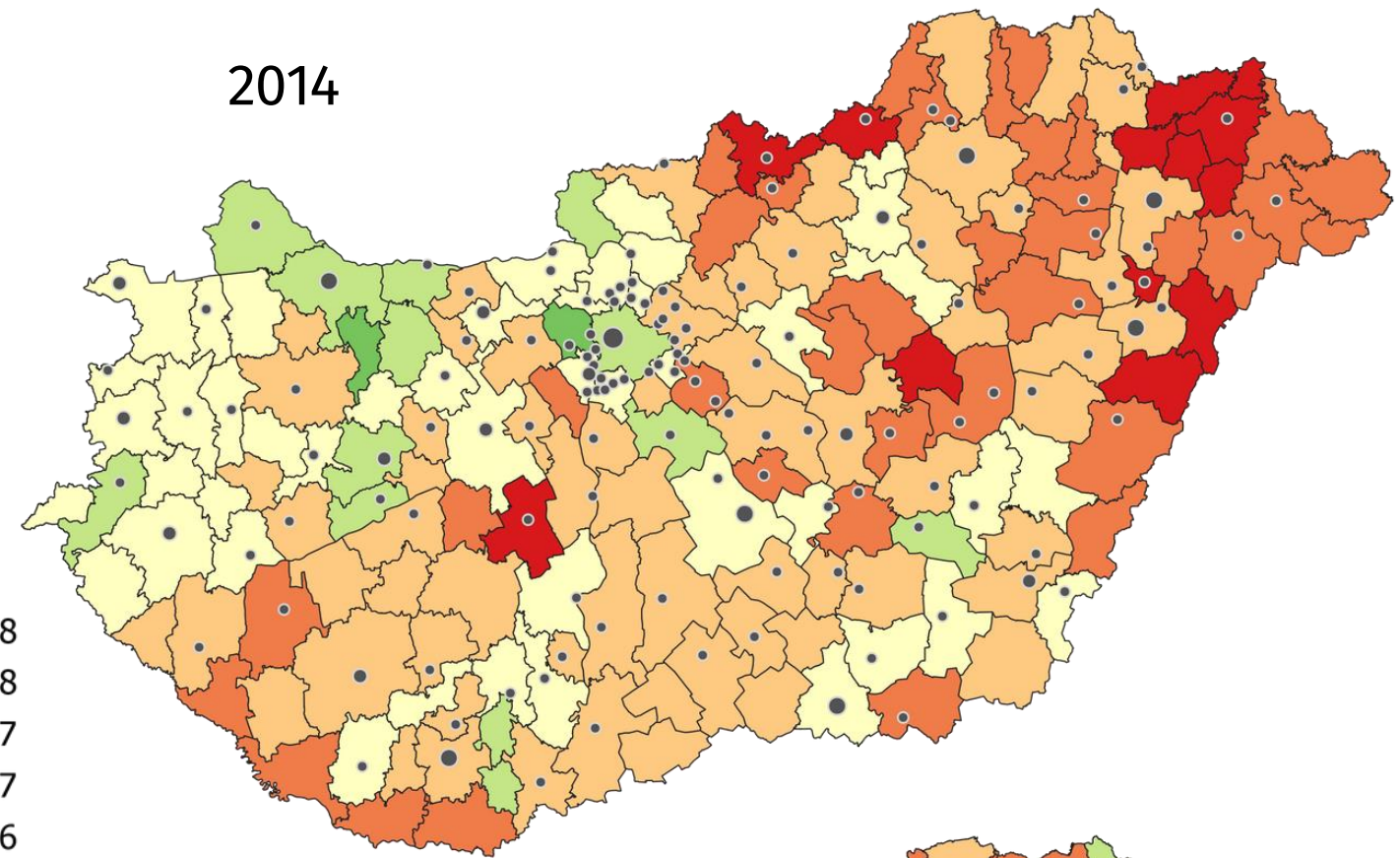
2020

Economic

Towns
- 10000 - 50000
- 50000 - 100000
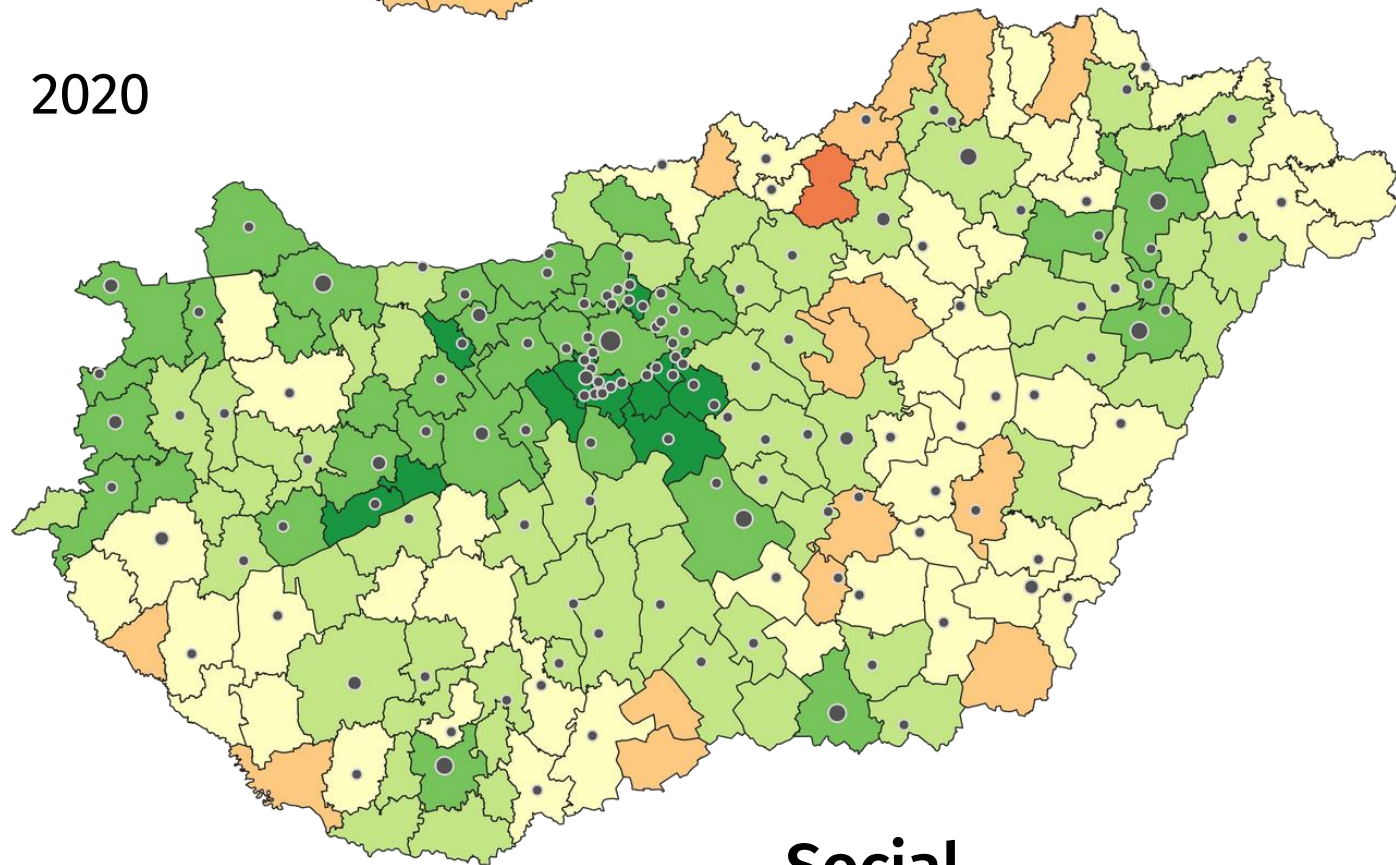- 100000 - 1000000
- 1000000 - 1706851

Social(20)
- 0,289 - 0,348
- 0,348 - 0,407
- 0,407 - 0,467
- 0,467 - 0,526
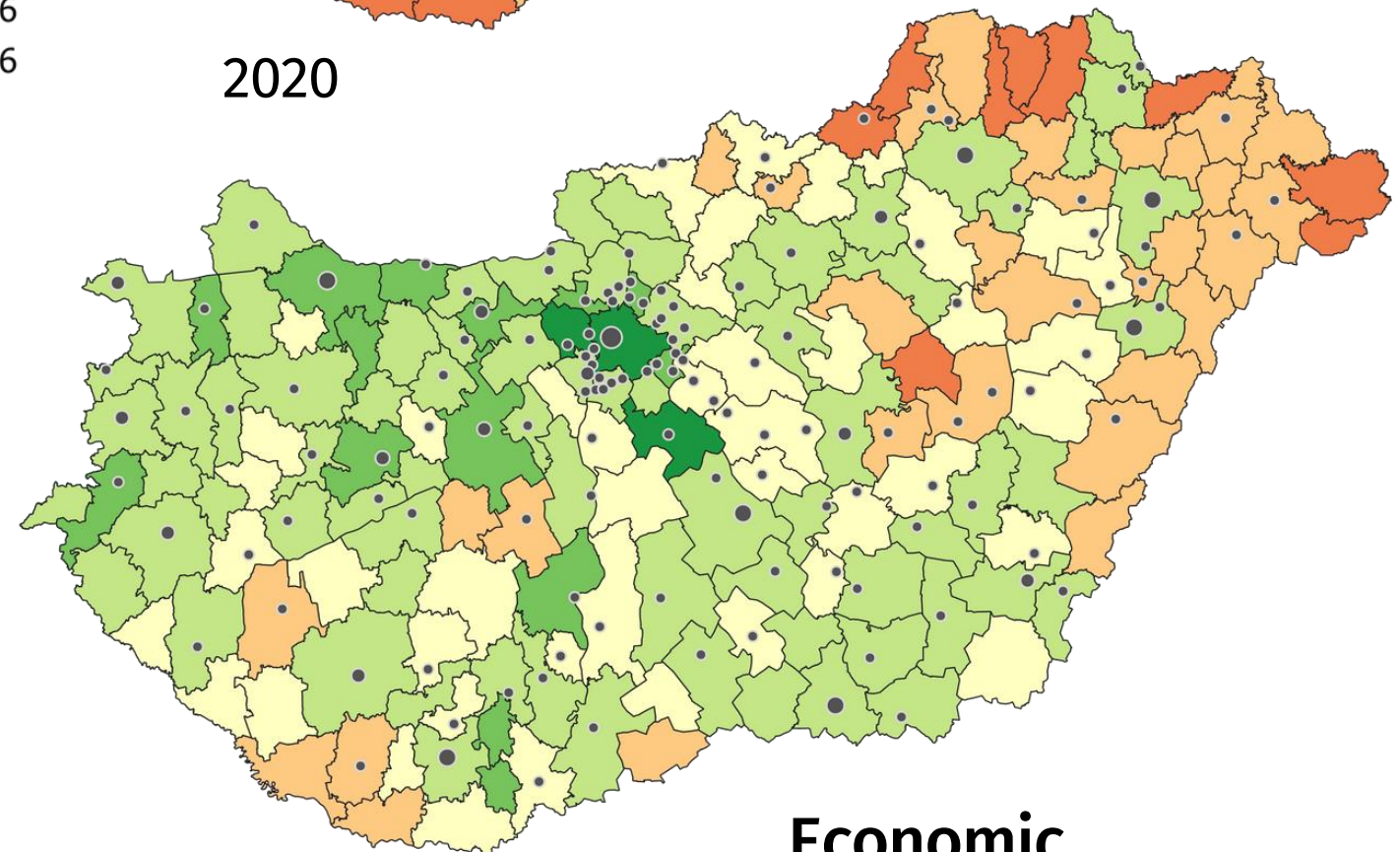- 0,526 - 0,585
- 0,585 - 0,645

Economic(20)
- 0,169 - 0,248
- 0,248 - 0,328
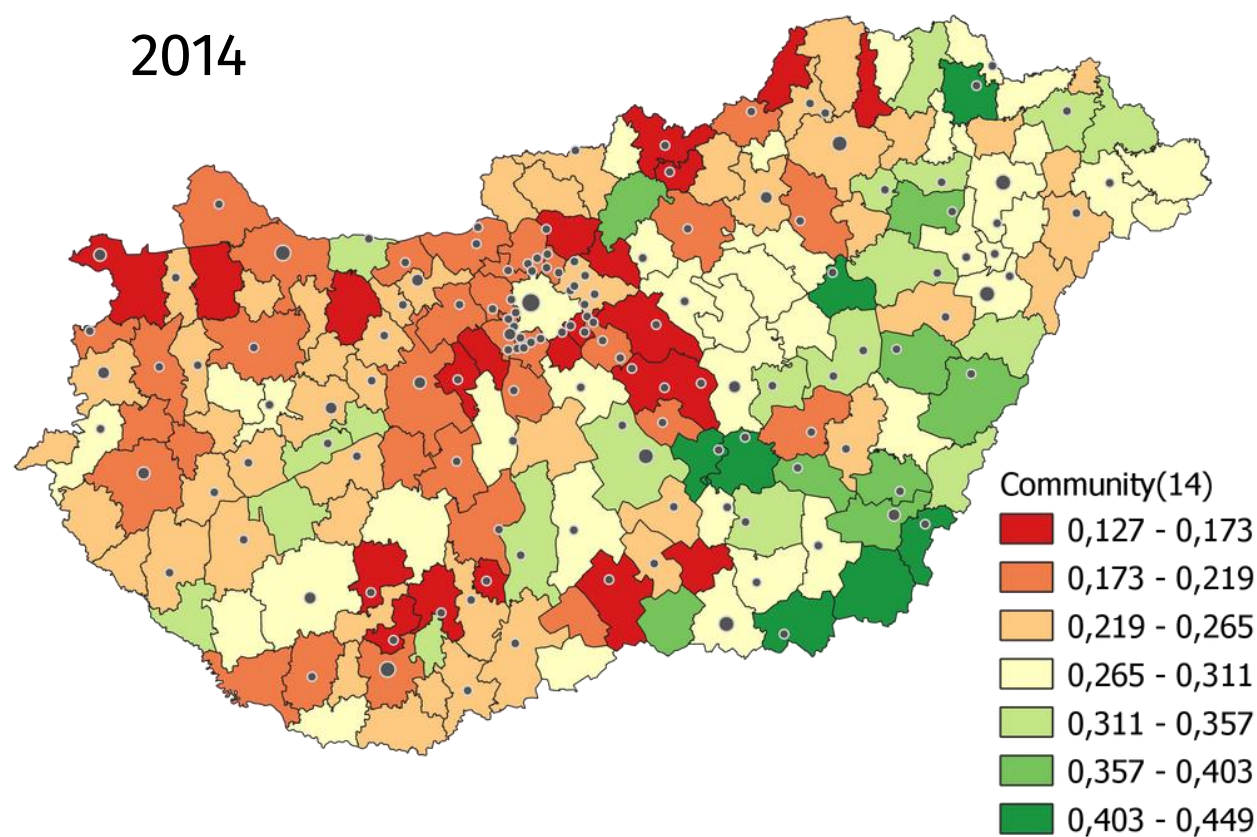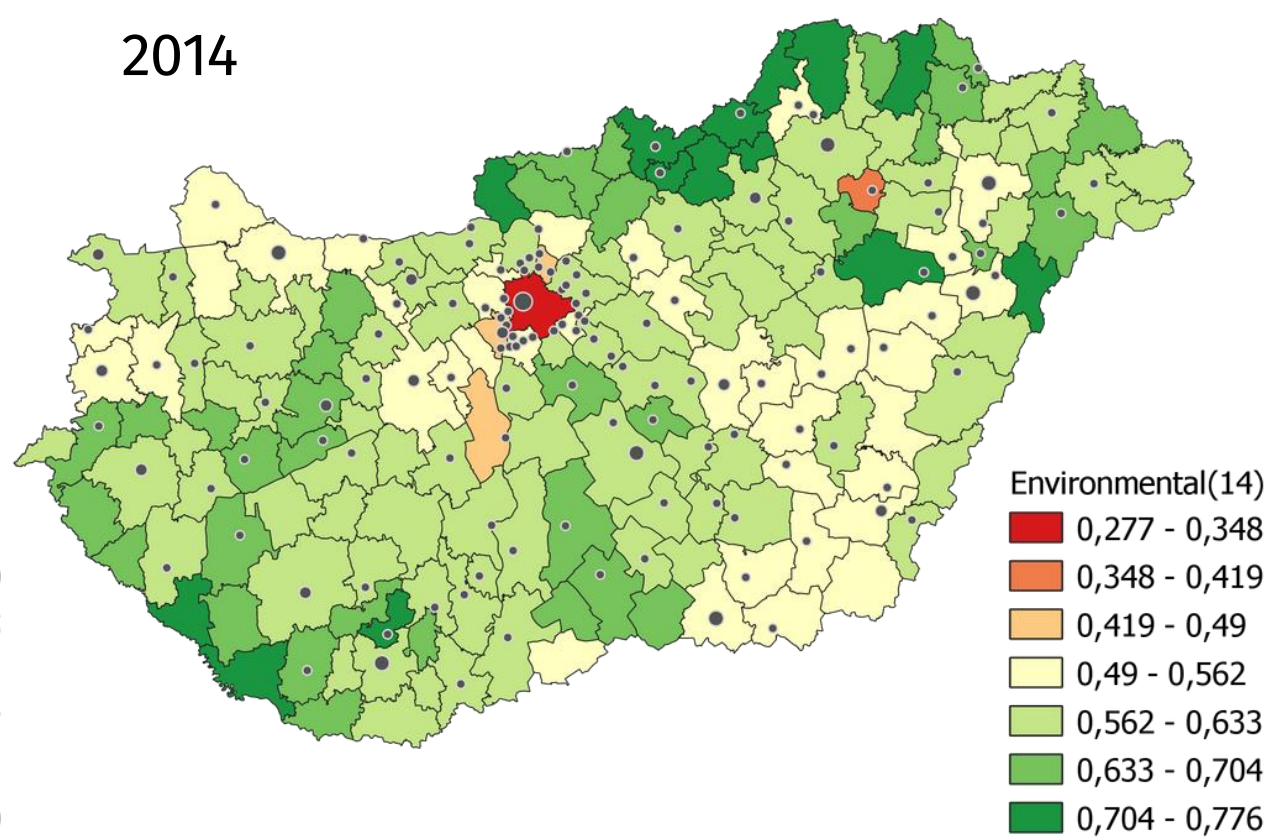- 0,328 - 0,407
- 0,407 - 0,487
- 0,487 - 0,566
- 0,566 - 0,646
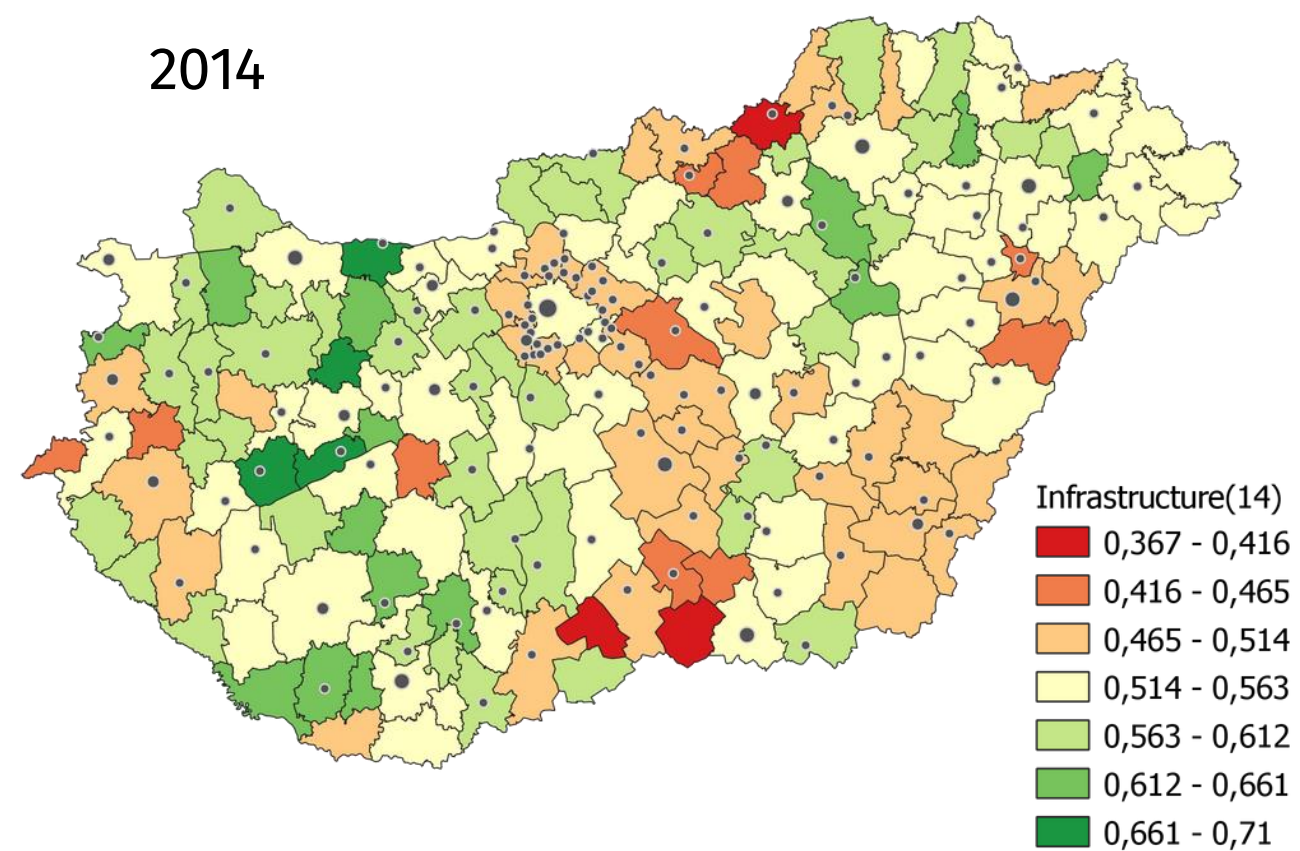
6.

Community, environment and infrastructure dimensions

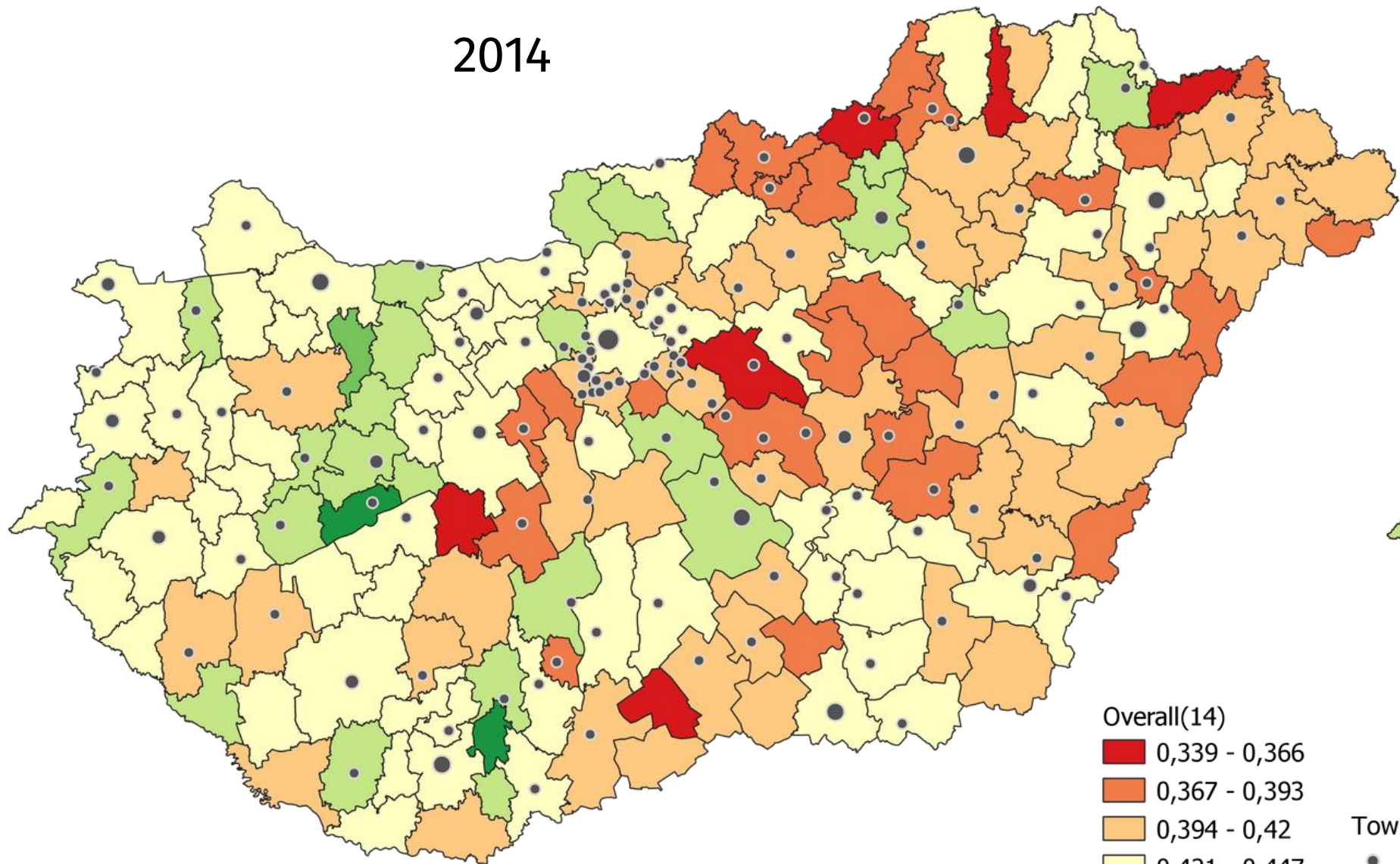**Community**

Environment

Infrastructure

7.
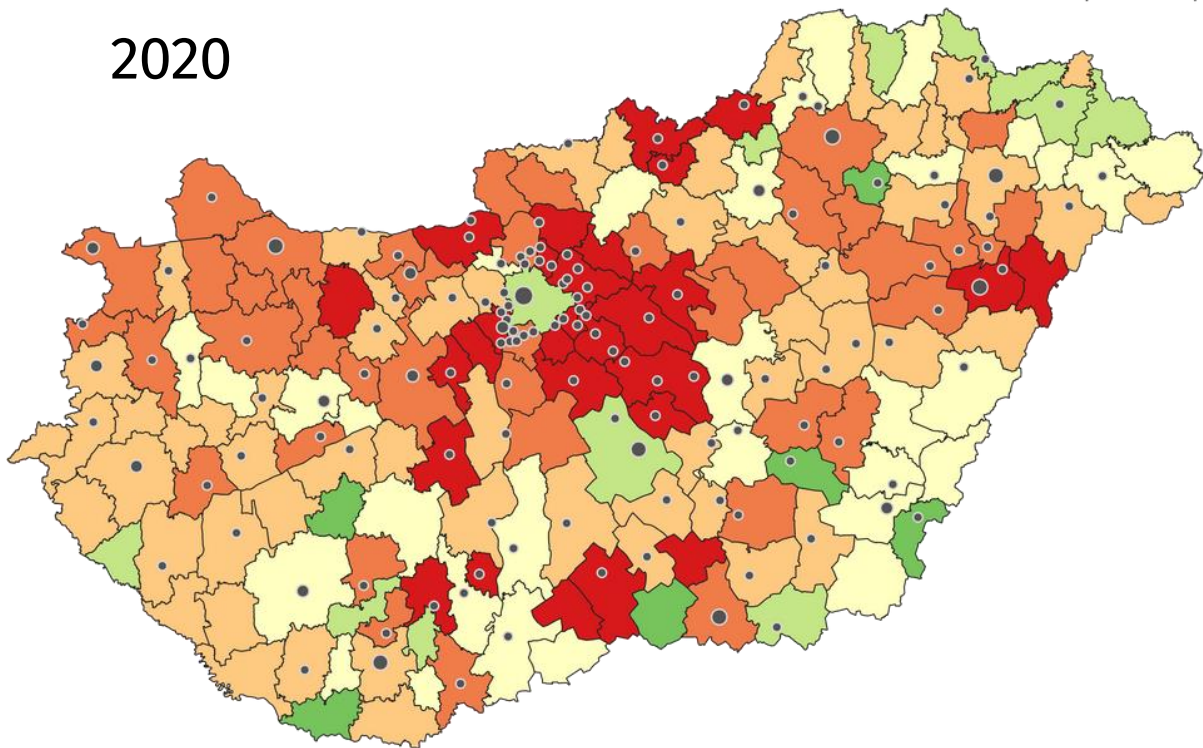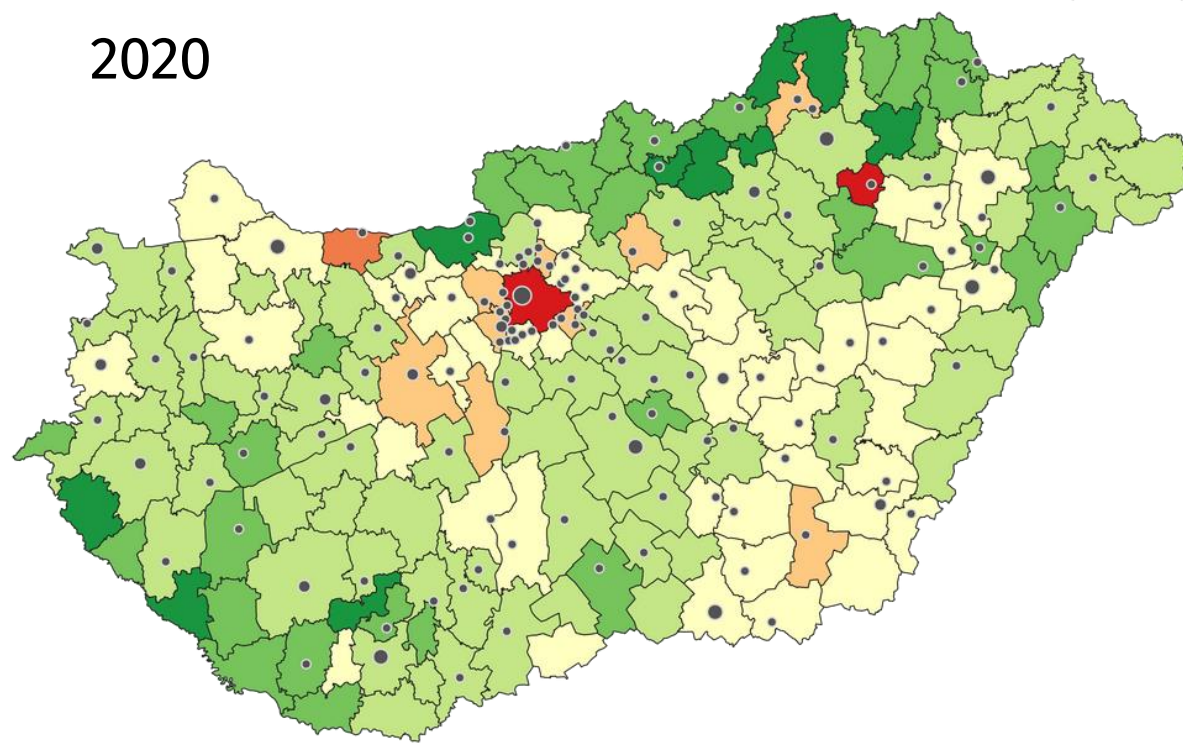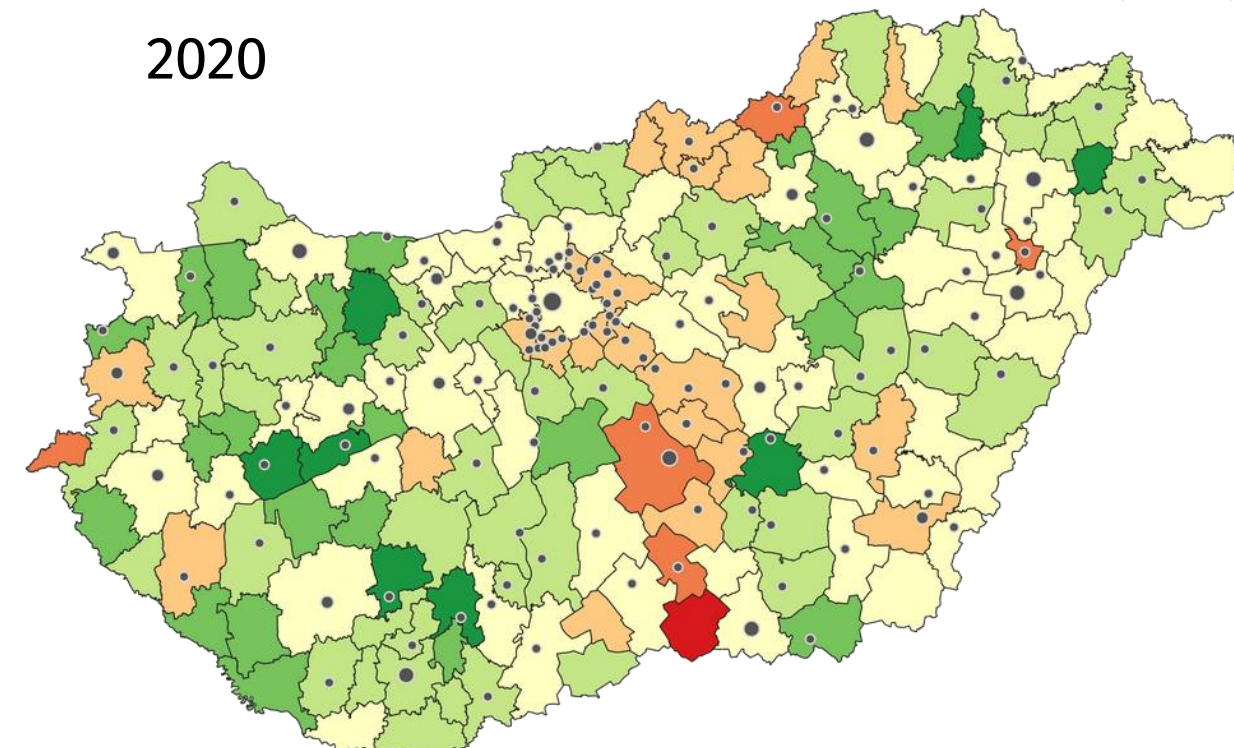
Overall community resilience score

2014

2020

Overall(14)
- ■ 0,339 - 0,366
- ■ 0,367 - 0,393
- ■ 0,394 - 0,42
- ■ 0,421 - 0,447
- ■ 0,448 - 0,474
- ■ 0,475 - 0,501
- ■ 0,502 - 0,529

Towns
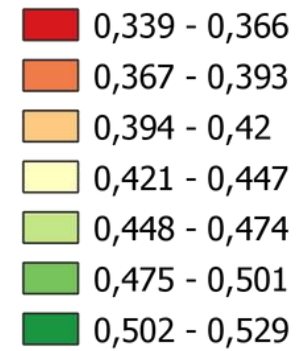- · 10000 - 50000
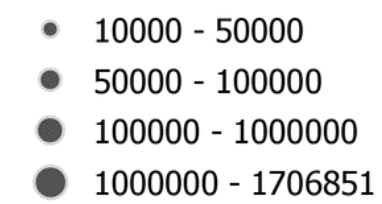- ● 50000 - 100000
- ● 100000 - 1000000
- ● 1000000 - 1706851

8.
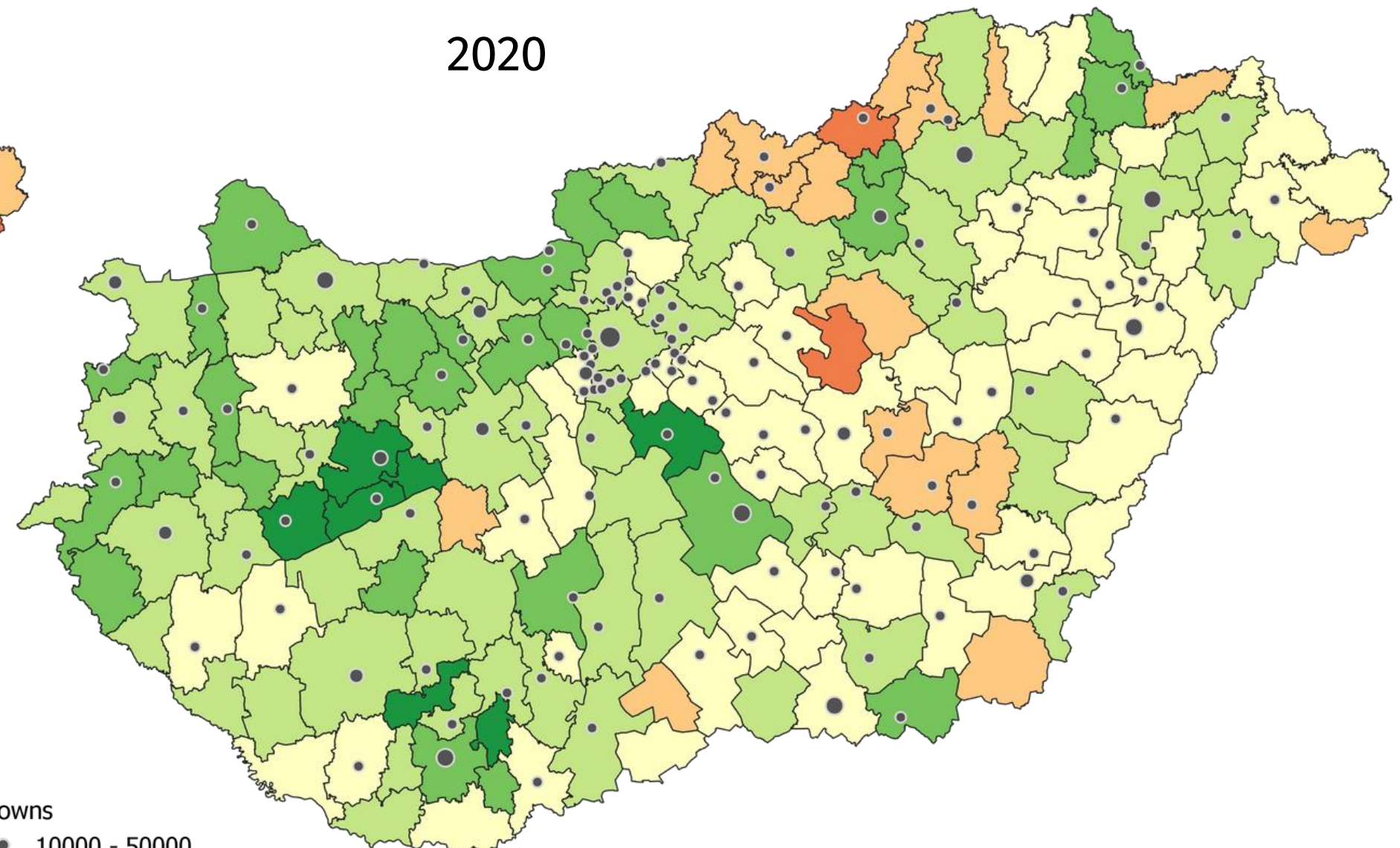
Summary

⬡ **Patterns and trends identified**

- High heterogenity of dimensions
- Traditional territorial disparities (East - West, urban - rural)
- Increasing role of urban regions
- Unsustainable development trajectories of dynamically/rapidly suburbanizing areas
- General increase in consumption, lack of development of formal and informal safety nets
- Improving socio-economic conditions
- Worsening of the ageing social structure

⬡ **Limitations**

- Availability of data
- Cross-country comparison
- Not tested empirically (on disasters)

THANK YOU FOR YOUR ATTENTION

Csizovszky Anna
csizovszky.anna@edu.bme.hu