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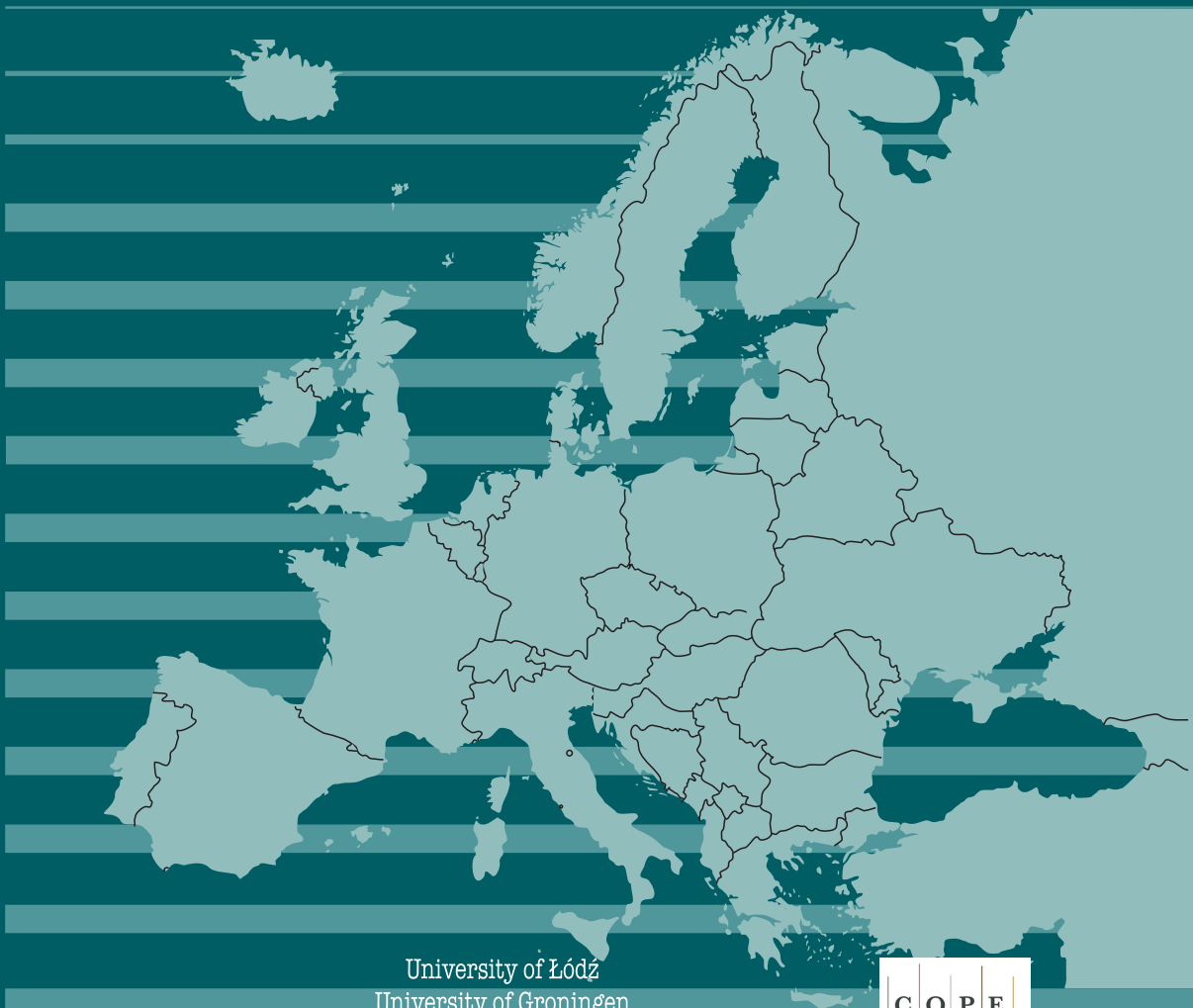

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ARTICLES

György Iván NESZMÉLYI [*], **Sergey VINOGRADOV** [**], **Henrietta NAGY** [***]

REGIONAL INEQUALITIES WITHIN THE VISEGRAD GROUP OVER THE YEARS 2000–2018

Abstract. In the present study the authors examined the spatial disparities of the Visegrad four countries to see whether the lasting cooperation of the four countries resulted in harmonious economic development or increasing gaps between the years 2000 and 2018. Based on the research results it can be concluded that regional disparities between core and periphery regions of V4 countries still have not been eliminated to a significant extent. Despite the fact that the Visegrad Group has been in the EU for 18 years, the catching-up of its regions occurred with various speed, and no harmonised development can be observed within the Group.

Key words: regional inequality, national-level inequality, Visegrad Group, Theil index.

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1. INTRODUCTION

Regional economic divergence has become a threat to economic progress, social cohesion, and political stability in Europe. Market processes and policies that are supposed to spread prosperity and opportunity are no longer sufficiently effective. Both mainstream and heterodox theories have gaps in their ability to explain the existence of these different regional trajectories and the weakness of the convergence processes among them (Iammarino *et al.*, 2019). It has been also stated that many efforts have already been made and several ideas have been promoted to solve the problems in the development of socially and economically underprivileged, peripheral areas. The process of European integration has influenced the growth potential of all regions across Europe. However, there have been very diverse development trajectories in different groups of countries. After their accession to the EU, Central and Eastern EU countries have followed a relatively common development path.

Our research focuses on the analysis of regional inequalities within the Visegrad Group (also referred to as V4 including Czechia, Slovakia, Poland, and Hungary). The Visegrad Four (the focus area of our research) has had a long history, having strong cooperation in the field of economics, society, culture, trade, as well as political cooperation.

In this study, based on the data for the period from 2000 to 2018, we intended to see the economic tendencies of the regions within the Visegrad countries to see the recent economic processes and the possible effects of the EU development funds used by the countries, as well as to provide a basis for future strategies. One has to mention the fact that our research was intended to be a continuation of a previous research in which also regional disparities of Visegrad countries were examined for the period 1995–2014 (Neszmélyi *et al.*, 2016), although with different methodology, but we reflect on it at certain parts of our study.

2. LITERATURE REVIEW

From geographical point of view, the countries in question are located in the heart of Europe. Hungary and Czechia are landlocked, thus road, railroad and inland water (river) transportation networks play an important role in their economies. The geographical basis is really predominant for any kind of further economic, social, and developmental analyses as this is the physical space where people live, companies must operate, and the characteristics of the geographical endowments influence the overall performance (Kozák *et al.*, 2019) and merely the development potentials of a certain region. In the case of the Visegrad countries, the

"inherited" characteristics have to be indicated, which also might enlighten the reasons for the regional inequalities and large discrepancies one can observe in the regional competitiveness of the four countries. Ženka *et al.* (2012) have argued that some of the competitiveness factors can be the fact that population density in Central European regions is lower than in Western European ones. The basis of their economies, the size of their domestic markets, and the intensity of spatial economic activity are also significantly smaller. If we look back in history, in the Visegrad Group there has always been a spectacular difference in economic performance between the Western and Eastern regions, having more developed regions close to Western European borders. In parallel, in Central Europe, it is also a common phenomenon to have significant economic and social inequalities between urban and rural areas, while the non-metropolitan regions are rather homogenous (Ženka *et al.*, 2012).

In V4 countries, capital cities traditionally play a dominant role in the economy. Capitals absorb an overwhelming part of the FDI inflow, financial, business, and academic activities are concentrated there, and their GDP per capita is much higher than the national averages are (Rechnitzer *et al.*, 2019).

In the transition process of all the four countries significant regional disparities could be seen, as in all former socialist countries in terms of production decline, unemployment, and foreign direct investment (FDI) indicators (Bod *et al.*, 2021).

Psycharis *et al.* (2020), Tello *et al.* (2019), and Burger and Šlampiaková (2021) have also highlighted the role of metropolitan areas in increasing regional inequalities in Central-Eastern Europe saying that nowadays cutting-edge technologies are more knowledge-intensive than the traditional ones and they are based on highly skilled workers and aim at the exploitation of R&D networks.

Excluding Slovakia, the three-layer regional competitiveness formation was characteristic to the other V4 members. The first layer means the capital city regions that reach the level of the developed regions of the EU. The second layer comprises the regions of Czechia, Western Slovakia, North-West Hungary, and Polish metropolitan regions. The third layer comprises the rest, mostly the Eastern regions of Poland, Slovakia, and Hungary. The first layer is attributed by knowledge based sectors, the second layer is by export industries and commercial services, while in the third layer competitiveness is missing in general (Korec, 2014).

Analysts of PMR Consulting have used a model to estimate the influence of individual location factors, while also considering other variables, such as the changes of the level of industrialisation of the region, which was connected to the collapse of unprofitable industrial plants. This model also helped to assess whether the respective factors were statistically significant or not (Burda, 2013).

It was also specified that the dispersion indicator of regional GDP/inhabitant (at NUTS 2 level) decreased in the entire EU27 from 2001 to 2007 and this showed a process of convergence. Regional disparities increased in the newest EU Member States, including the Visegrad countries (Kutscherauer *et al.*, 2010).

Additionally, Enyedi (2009) has found that regions in Hungary have reached three different stages of economic development: Budapest Metropolitan Region (BMR) is a foremost growth pole of the country. It is a real knowledge-based and innovation-generating economic region. North-Western Hungary is in the stage of investment-driven development having a knowledge-user economy without generating it locally. Northern and Eastern Hungary is in a neo-Fordist stage of economic development, where economic restructuring has just started; under-employment and a rural crisis are widespread, with an exception of some larger cities.

Other authors have claimed that during the 2000s there was a regional divergence in the income distribution in Polish regions. This was confirmed by an analysis based on two traditional concepts of measuring differences in regional development, i.e. sigma and beta divergence (Gurgul and Łach, 2011).

Ratazjac (2011) in his study has indicated that the regions of Eastern Poland metaphorically referred to as "The Eastern Wall" (consisting five voivodeships, which correspond to NUTS 2 units, like Lubelskie, Podkarpackie, Podlaskie, Świętokrzyskie, and Warmia-Mazuria) are among the poorest in Poland and also in the European Union. Its markedly lower level of socio-economic development is a consequence of both exogenous and endogenous factors. Even in the pre-accession period domestic steps were taken to stop its advancing pauperisation, but the region received a new powerful growth stimulus only after Poland had joined the EU.

In the case of Slovakia it was statistically proven that regional disparities significantly increased between 2002 and 2010 – which was the very period when Slovakia was about to introduce the Euro and went through a rapid economic growth process, although the growth was experienced mainly due to the development of Bratislava agglomeration, while rural regions were lagging (Habanik *et al.*, 2013).

Káposzta and Nagy (2015) analysed the progress of the four countries with a special focus on meeting the EUROPE 2020 targets set by the EU. They stated that by 2015 a certain extent of cohesion among the Visegrad countries could be observed but country-specific challenges (e.g. poverty in Poland and Hungary; high percentage of early school leavers in Hungary; low employment rate in Hungary; poor R&D sector in Slovakia) needed to get more emphasis in future strategies. They also stated that economic cooperation needed to be strengthened, national development priorities and directions should be harmonised, and cross-border cooperation had to be encouraged and developed.

Kertész (2004) has also underlined that if an underdeveloped economy starts converging to international averages, in the national economy either the inter-regional differences will grow or the process of their closing up to each other would slow down. In V4 countries, as a result of the economic growth, regional disparities, in terms of economic development, have grown considerably, yet this trend seems to have halted and reversed after reaching a certain level of development.

Therefore, one can see that various aspects have been considered in several studies, from time to time, to reflect the economic processes and the level of convergence in the Visegrad Four. Since the objectives of the four countries are to maintain a strong relation and to maintain harmonised development, it is inevitable to examine what the common and the different tendencies of their economies are.

3. RESEARCH METHODOLOGY

The economic development of a region can be measured in part by the regional GDP per capita. It is one of the most commonly used indicators in the European Union when measuring economic development and eligibility for development funds. In their research, Neszmélyi *et al.* (2016) applied the Williamson-hypothesis (Williamson, 1965) and used weighted logarithmic standard deviations (WLSD) in order to measure the territorial differences of the V4 region. A correlation was found between regional differentiation and development, corresponding to the Williamson curve: in regions with a higher GDP per capita, the inner disparities were smaller than in regions with a lower GDP per capita. The idea of regional competitiveness was also stressed by Enyedi (2009) who described the concept in terms of three related economic parameters: (a) GDP per capita; (b) labour productivity; and (c) employment rate. According to Korec (2014), per capita regional GDP is the most often used method of measuring regional economic prosperity. The European Union, for instance, has used this indicator in its assessment of regional disparities and subsequently in the establishment of regional aid convergence rules.

A complex approach was used in this study to examine the internal disparities among the Visegrad-Group Member countries (the Czech Republic, Slovakia, Poland, and Hungary) and the relationship between the centre and the periphery, as well as the dynamics of economic growth and development, as well as the prospects for integration. The following main hypotheses have guided the preparation of the examination of the territorial differences at NUTS2 level territorial units of the V4 countries:

1. The first hypothesis (H1) is that regional disparities between core and periphery regions of V4 countries still have not been eliminated to a significant extent during the studied period, and in fact they grew in certain cases.
2. The second hypothesis (H2) suggests that the level of economic development and the disparities among regions are positively correlated.

There are three common measures of inequality: the Gini coefficient, the coefficient of variation, and the Theil index (Theil, 1967). In this study, for reasons of the allotted space for the article, the Theil index has been chosen to measure territorial inequalities. This index belongs to the so-called general entropy (GE) class

of inequality measures. We chose the relative index because the maximum value of the non-relative Theil index is equal to ln(n). Thus, as the number of regions differs from one Visegrad 4 country to another, the maximum value of the index would not have been the same, which would have made the comparison difficult. The relative Theil index (Bellù and Liberati, 2006) is not defined in the value of the indicator equals zero, and has 1 as upper limit.

Agreeing with Glushenko's (2017) findings, the population-weighted indices were used to measure inequality on the national level, to assess the regional inequalities, we applied the unweighted measures. The unweighted relative Theil index (Bellù and Liberati, 2006) can be written as:

$$RTh = \frac{\frac{1}{n}\sum_{i=1}^{n}\frac{y_i}{\overline{y}}\ln\left(\frac{y_i}{\overline{y}}\right)}{\ln n} \tag{1}$$

where:
i = the i-th region, i = 1, 2, …, n;
y_i = the value of the examined indicator in the i-th region; and
$\overline{y}$ = the arithmetic average of regional values of the examined indicators.

The population-weighted counterpart of the relative Theil inequality index (based on Glushenko, 2017) takes the form:

$$RTh_w = \frac{\sum_{i=1}^{n}\frac{f_i}{\sum_{i=1}^{n} f_i}\frac{y_i}{\overline{y}_w}\ln\left(\frac{y_i}{\overline{y}_w}\right)}{\ln n} \tag{2}$$

where:
f_i = population of the i-th region;
$\sum_{i=1}^{n} f_i$ = total population of the country or total population of the Visegrad group;
$\overline{y}_w$ = the weighted average of regional values of the examined indicators for the country or for the Visegrad Group.

The Eurostat's Regional Database provides research data on about 37 regions of the Visegrad group countries. Some data sets for certain years were not available, especially for Poland.

The following indicators were included in the study:

1. Purchasing Power Standard (PPS) per inhabitant,
2. Unemployment rate,
3. Life expectancy at birth,
4. Disposable income of private households,
5. Intramural R&D expenditure (GERD), and
6. Motorway density.

Traditionally, GDP per capita is used to assess regional inequalities (Barrios and Strobl, 2009; Kallioras, 2010; Muštra and Škrabić, 2014; Psycharis *et al.*, 2020) but GDP is only a limited metric for measuring economic development and is useless for measuring quality of life. In this study, we selected indicators to reflect the input (motorway density, and GERD) and output (GDP per capita, unemployment rate, and disposable income) levels, as well as the outcomes (life expectancy).

Per capita Purchasing Power Standard (PPS) is the monetary value of all final goods and services produced by an economy within a given period (EUROSTAT 2022). According to Purchasing Power Standards (PPS), GDP per inhabitant is expressed in relation to the European Union (EU28) with an average of 100.

The source for the regional labour market data needed for calculating unemployment rates down to NUTS level 2 is the EU Labour Force Survey (EU-LFS). Surveys of households are conducted quarterly in all EU Member States, the United Kingdom, EFTA countries, and candidate countries. In actuality, life expectancy at birth describes the average number of years a new-born will live as long as mortality trends remain the same as when the baby was born. Private households' disposable income consists of the difference between primary income (operating surplus or mixed income plus employee compensation minus property income paid) and redistribution of income in cash. In terms of R&D spending, the share of R&D (Gross domestic expenditure on R&D) financed by industry, government, higher education, and private non-profits is the intramural R&D expenditure (GERD). To measure the level of transport infrastructure, we chose the motorway density, which is expressed in kilometres per square kilometre.

The examined period varies depending on the available data: 2000–2018 for the GDP (PPS) data, 2000–2019 for the unemployment rate, 2014–2018 for life expectancy at birth, 2010–2017 for disposable income of private households, and the 2017 and 2018 data for intramural R&D expenditure. The transport infrastructure (motorway density) was examined based on the latest 2018 data. ArcGIS Pro application was used to create maps to reflect regional inequalities regarding the examined indicators. Population-weighted indices measure inequality at the national (or Visegrad group) level, and unweighted indices can be used to measure inequality among regions. The Theil index volatility was measured using the relative standard deviation (RSD) calculated for the examined period.

4. RESEARCH RESULTS

Having examined the lowest and the highest regional values, moreover the development of national averages, it can be seen that the regional disparities have not diminished in Visegrad countries (Fig. 1). It is typical for all the Visegrad countries that

the national average is closer to the lowest value of regional development while the highest value of regional development is more distant from the national average. It means that in all the Visegrad countries there are outstandingly developed regions located, namely the capital regions. In all of the V4 countries the gap between the capital regions and the least developed region widened during the examined period. Most of the Visegrad countries are historically one-centered countries (except Poland), meaning that the capitals have always played significant role in the lives of the countries and this is reflected by the results of our analysis as well.

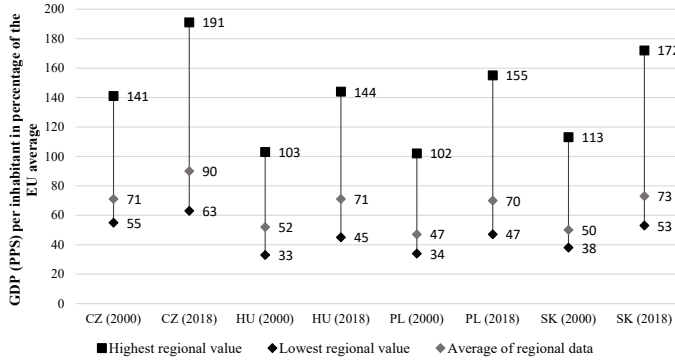

Fig. 1. Regional differences in the values of the GDP (PPS) per inhabitant in the percentage of the EU average in the Visegrad Countries in 2000 and 2018

Source: own work based on data from Eurostat (2000), data code: nama_10r_2gdp.

Fig. 2 shows that in the course of the examined 18 years, four regions in Poland and additional three regions in Hungary were unable to close the gap to the other regions. In the abovementioned regions, the per capita GDP did not even exceed 50% of the EU average in 2018. While in 2000, the gap in terms of the level of development between the capital and rural regions was robust, by 2018 – even though the economic supremacy of the capital regions still sustained – a number of rural regions managed to reduce their backwardness behind state capitals.

Within the Visegrad group it was Czechia where the highest number of regions could exceed 70% of the EU 28 average. It was also typical that the process of closing the gap of the Eastern regions of the V4 was slower. In terms of per capita GDP, the biggest regional disparities could be observed in Slovakia. However, the largest disparity at the national level was observed in Hungary between 2004–2014, as well as in 2018. Measuring at both regional and national levels, the most moderate disparities in terms of GDP were measured in Poland (Table 1). Theil indices are presented here and below for the first and last years of the period studied. When measuring regional inequalities, the highest volatility is observed in the Slovak (%RSD = 9.25) and Hungarian (%RSD = 12.42) data. Time-wise volatility

in the national level inequality is higher as well for Slovakia (%RSD = 11.92) and Hungary (%RSD = 11.36). In the case of the Hungarian data, however, volatility measured at the national level is lower compared to the values measuring inequality among regions. At both regional and national levels, the variability of Theil index values for the period 2000–2018 is low in Visegrad countries.

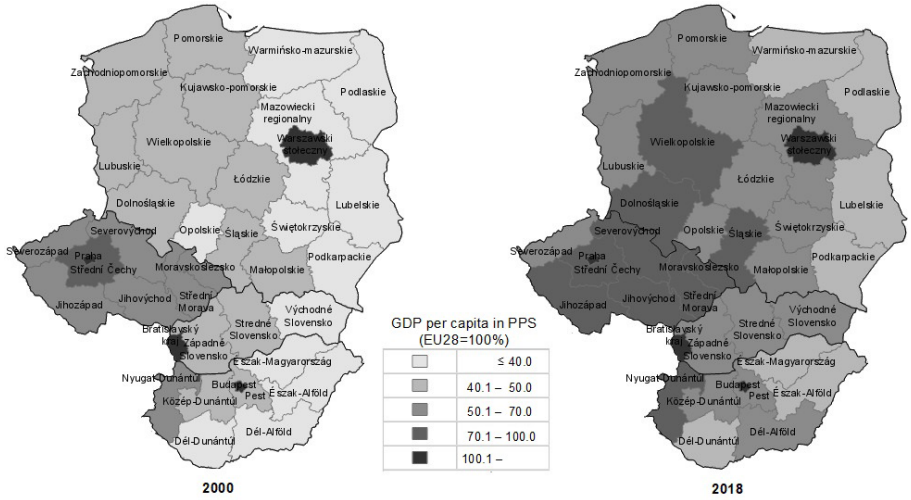

Fig. 2. Comparing the regions of the Visegrad countries based on the values of the GDP (PPS) per inhabitant in the percentage of the EU average in 2000 and 2018

Source: own work based on data from Eurostat (2000), data code: nama_10r_2gdp.

Table 1. The regional inequalities in GDP per capita (PPS) between 2000 and 2018 for the Visegrad countries

Index	Country	2000	2018	RSD% (2000–2018)
relative Theil index (unweighted)	CZ	0.026	0.035	7.81
	HU	0.038	0.041	12.42
	PL	0.016	0.019	7.13
	SK	0.088	0.100	9.25
	V4	0.023	0.024	7.03
relative Theil index (weighted)	CZ	0.049	0.070	7.85
	HU	0.092	0.104	11.36
	PL	0.053	0.058	7.76
	SK	0.075	0.099	11.92
	V4	0.072	0.075	5.26

Source: own work based on data from Eurostat (2020), data code: nama_10r_2gdp, demo_r_d2jan.

In the paper we intended to cover the years 2000–2018, but since unemployment rate data was available for the year 2019 as well, we decided to also include that year in the analysis. Unfortunately, for the rest of the indicators, we were not able to collect the 2019 data, so we continued to focus on the period 2000–2018. According to Fig. 3, from 2000 to 2019, regional differences have merely diminished in terms of unemployment in V4. In 2019, there were only 5 regions in which unemployment rate was higher than 5%, out of which one region (Northern Great Plain) was in Hungary, while there were 2 such regions in Slovakia (Stredné Slovensko, Vychodné Slovensko) and 2 in Poland (Lubelskie, Podkarpackie). The largest territorial differences in this respect could be found in Slovakia, while in all the three examined countries a peak could be observed in terms of the inequality index in 2008. As there was insufficient data available from Poland, this examination could not be extended to Poland.

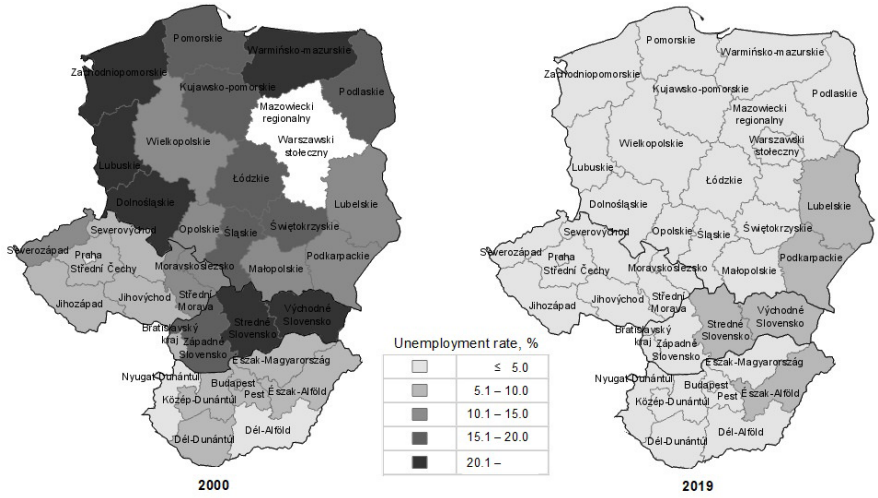

Fig. 3. Comparing the regions of the Visegrad countries based on the unemployment rates in 2000, 2019
Note: incomplete data for the Mazowiecki and Warszawski regions of Poland in 2000

Source: own work based on data from Eurostat (2020), data codes: lfst_r_lfu3rt.

In Visegrad countries, based on the unemployment rates at both the regional and national levels, the variability of the Theil index values for the 2000–2018 period was high (Table 2). On the basis of unweighted Theil index values measuring regional inequality, Poland (RSD%=46.76) and Hungary (RSD%=44.72) had the highest variability. Slovakia had the highest regional disparity in both 2000 and 2018. In 2000, the Czech Republic and in 2018, Slovakia had the highest inequality at the national level in terms of the weighted Theil index.

Regarding life expectancy, among the V4 regions, a Hungarian region had the worst indicator value (Northern Hungary) in both years, 2014 and 2018. According to

data, in six other Hungarian regions (out of 8), life expectancy at birth did not exceed 77 years in 2018. Only in four regions of Poland (out of 17) the value of the indicator did not exceed 77 years. Thus, out of the 11 regions with the most unfavourable value of the indicator, 7 regions were Hungarian and 4 were Polish in 2018. The value of Theil index, calculated at both regional and national levels, increased in the case of Hungary and by 2018 reached the highest value among the V4 countries (Table 3). In Slovakia, the unweighted Theil index values measuring regional inequality were highly variable for the 2014–2018 period. In terms of measuring nation-wide disparity, Czechia had the highest variability of Theil index values.

Table 2. The regional inequalities in unemployment rates between 2000 and 2018 for the Visegrad countries

Index	Country	2000	2018	RSD% (2000–2018)
relative Theil index (unweighted)	CZ	0.040	0.034	28.45
	HU	0.024	0.043	44.72
	PL	0.005[a]	0.014[a]	46.76
	SK	0.054	0.078	25.87
	V4	0.013[a]	0.028[a]	31.67
relative Theil index (weighted)	CZ	0.041	0.039	30.61
	HU	0.029	0.057	35.89
	PL	0.008[a]	0.015[a]	40.10
	SK	0.037	0.068	31.85
	V4	0.011[a]	0.026[a]	34.98

[a]The first year examined for Poland and the EU is 2013, because the data for Poland is incomplete

Source: own work based on data from Eurostat (2020), data code: lfst_r_lfu3rt.

Table 3. Regional inequalities in life expectancy at birth between 2014 and 2018 for the Visegrad countries

Index	Country	2014	2018	RSD% (2014–2018)
relative Theil index (unweighted)	CZ	0.00004	0.00004	5.24
	HU	0.00005	0.00005	7.43
	PL	0.00002	0.00002	6.86
	SK	0.00004	0.00003	29.55
	V4	0.00004	0.00004	3.40
relative Theil index (weighted)	CZ	0.00023	0.00016	67.90
	HU	0.00013	0.00067	41.89
	PL	0.00007	0.00020	66.68
	SK	0.00006	0.00033	52.71
	V4	0.00004	0.00003	3.41

Source: own work based on data from Eurostat (2020), data code: tgs00101.

Regarding disposable income, in 2010, four out of the five regions of the Visegrad countries with the lowest disposable income (not exceeding 8,000 euros) were located in Hungary (Fig. 4). By 2017, three of the five regions with the lowest disposable income (not exceeding 10,000 euros) still belonged to Hungary. Both regional and national inequality values, measured by Theil index, were exceptionally high in Slovakia (Fig. 5). For the other three countries studied, the inequality values did not differ significantly.

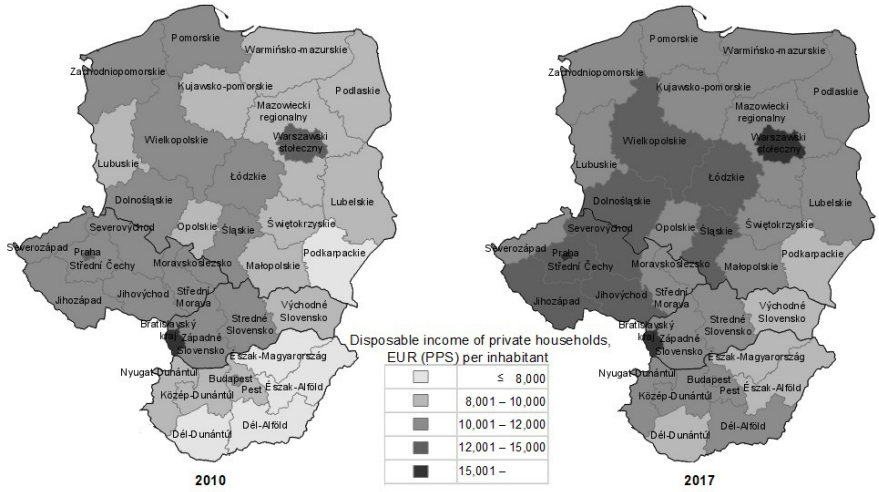

Fig. 4. Comparing the regions of the Visegrad Countries based on the disposable income of private households in 2010 and 2017

Source: own work based on data from Eurostat (2020), data codes: tgs00026.

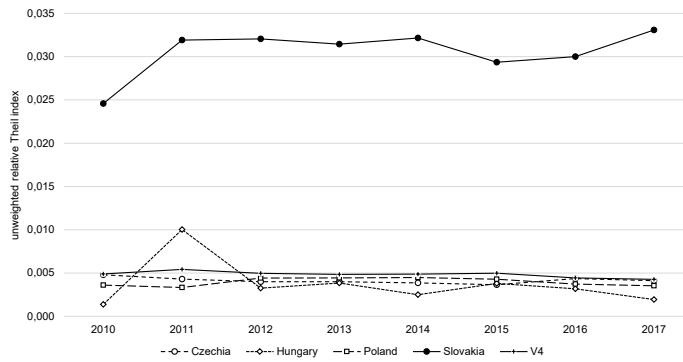

Fig. 5. Trends in regional disparities in disposable income of private households for the Visegrad countries, 2010−2017

Source: own work based on data from Eurostat (2020), data codes: tgs00026.

According to Fig. 5, in 2011, the Hungarian value jumped, both in regional and national inequality, even if by 2017, it had the lowest inequalities in the disposable income among the V4 countries, measured at both the regional and national levels.

We examined regional differences in terms of R&D expenditures from two approaches: in terms of per capita expenditures (Fig. 6) in euros and in percentage of GDP (Fig. 7). As data in full time series was not available, we had to limit our analysis to the years 2017 and 2018. Out of the regions of the V4 countries with the lowest value of intramural R&D expenditure (not higher than 70 euros per inhabitant), one region was in Czechia and one in Slovakia, two regions in Hungary, and eight in Poland in 2018.

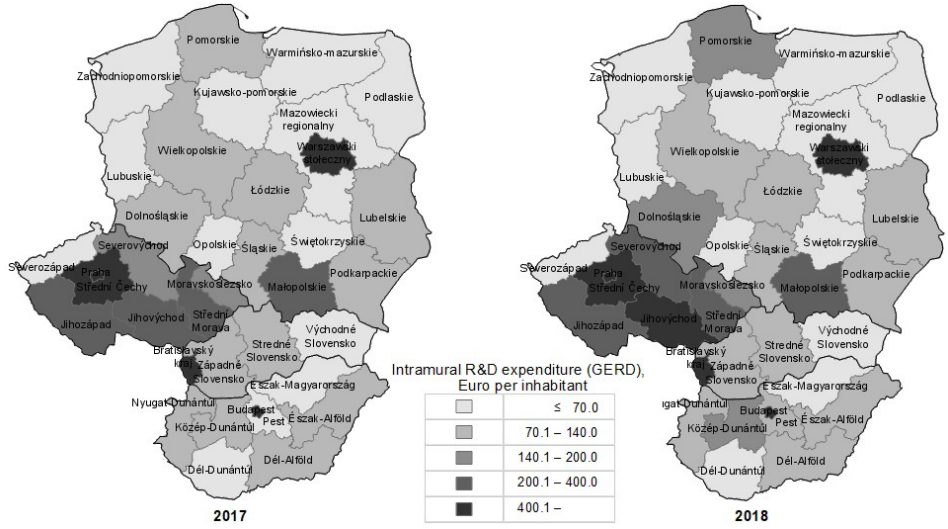

Fig. 6. GERD values in V4 (NUTS-2) regions (per capita EUR) in 2017 and 2018
Source: own work based on data from Eurostat (2020), data code: rd_e_gerdreg.

The value of the indicator as percentage of GDP did not exceed 0.5% in only one Czech region (Severozápad), one Slovak region (Východné Slovensko), and two Polish regions (Lubuskie and Mazowieckie). The results showed that in the case of the per capita indicator the territorial differences were larger both at national and regional levels (Table 5). The weighted and unweighted index-values did not show significant differences in the case of the per capita values which refers to the fact that differences at national and regional levels are of similar extent. Based on the result of the Wilcoxon test it could be proved only in the case of Czechia that the difference among regions exceeded the average value of differences measured at the national level, both in absolute (euro per capita, $Z=2.214$, $p=0.027$) and relative (percentage of GDP, $Z=-2.207$, $p=0.027$) values. The highest and lowest values of both in euros per capita and in percentage of

GDP measured GERD were in the Czech Republic: Prague had the highest value among the V4 countries (1,110.5 euros per capita, 2.68%) and Severozápad had the lowest value (45.4 euros per capita, 0.33%).

Table 5. Regional inequalities in intramural R&D expenditure (GERD) in 2017 and 2018 for the Visegrad countries

Index	Country	Intramural R&D expenditure (GERD), Euro per inhabitant		Intramural R&D expenditure (GERD), percentage of GDP	
		2017	2018	2017	2018
relative Theil index (unweighted)	CZ	0.142	0.140	0.058	0.055
	HU	0.228	0.216	0.061	0.054
	PL	0.156	0.137	0.060	0.049
	SK	0.362	0.324	0.082	0.068
	V4	0.139	0.127	0.050	0.043
relative Theil index (weighted)	CZ	0.130	0.128	0.009	0.008
	HU	0.232	0.222	0.034	0.035
	PL	0.148	0.133	0.007	0.003
	SK	0.340	0.296	0.080	0.073
	V4	0.129	0.119	0.049	0.043

Source: own work based on data from Eurostat (2020), data code: rd_e_gerdreg.

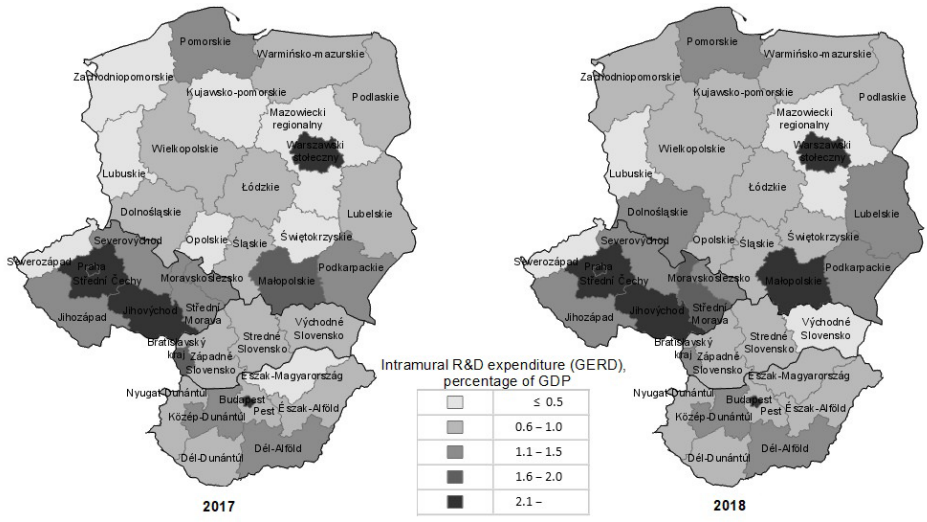

Fig. 7. GERD values in V4 (NUTS-2) regions (in percentage of GDP) in 2017 and 2018
Source: own work based on data from Eurostat (2020), data code: rd_e_gerdreg.

Regarding the transportation infrastructure, we can see that Budapest had the highest motorway density (120 kilometres per square kilometres) compared to the other NUTS2 regions (Fig. 8). Eight out of nine regions with the lowest values (not exceeding 4 kilometres per square kilometres) of the motorway density were located in Poland, making those regions less attractive for foreign direct capital and investments. It has been agreed that the motorway density has both positive and negative impacts on investments, the settlement of businesses, and the density of qualified human resource, but it is surely an important requirement.

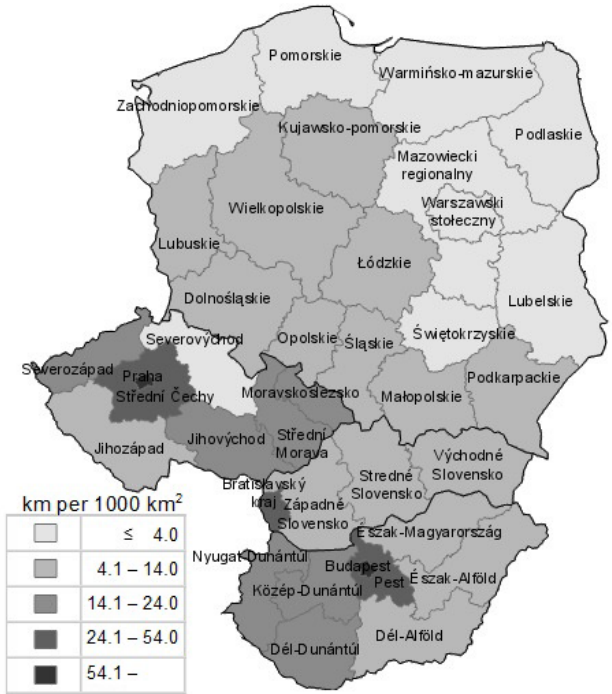

Fig. 8. Comparing the regions of the Visegrad Countries based on the motorway density (km per 1,000 square km)

Note: data for the Mazowieckie Voivodeship macro region (PL9) of Poland was used as the regional value for Poland's regions of Warsaw (the capital city) (PL91) and Mazowiecki (regional) (PL92)

Source: own work based on data from Eurostat (2020), data code: tran_r_net.

In terms of the extent of regional disparities, Slovakia has the largest regional disparity in the road network indicator (Fig. 9). The highest value of inequality, measured at the national level, was in Poland, which is not surprising since most of the regions with the lowest density can be found in that country. Due to the above-mentioned infrastructural disparities, only integrated complex development strategies can help to mitigate the existing accessibility challenges.

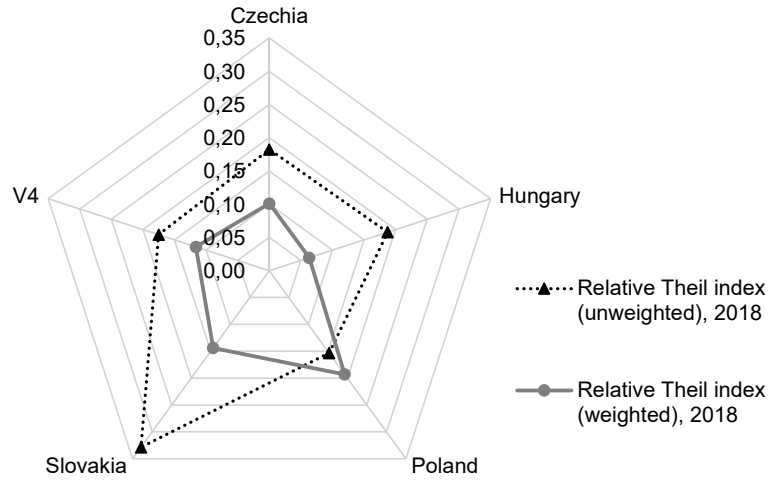

Fig. 9. Estimate of inequalities in the motorway density (km per 1000 square km) in the Visegrad countries

Source: own work based on data from Eurostat (2020), data code: tran_r_net.

5. CONCLUSIONS

In our research we examined the peculiar way of the development of the Visegrad Four and in the frames of this we analysed the state of regional disparities, and the centre vs. periphery relationship of the recent years at macro-region (NUTS 2) level. By using the applied mathematical-statistical analytical methods we succeeded to partially verify our first hypothesis (H1). It means that the disparities between the core (capital) and periphery (rural) regions are still high, especially in the case of eastern regions. However, in the case of other regions – in all four countries – there were regions which could get closer to the core regions in terms of the examined parameters. Additionally, our results seem to be confirmed by empirical information and facts as well. In terms of our other hypothesis (H2), i.e. that interregional disparities are positively related to the state of economic development of countries, we found it unproven. Poland had the lowest regional disparities for most of the indicators examined (four out of seven). Slovakia had the highest regional inequality according to five indicators. In terms of the GDP (PPS) per inhabitant as a percentage of the EU average in 2018, Slovakia was second after Czechia and Poland was fourth among the Visegrad countries. It would be interesting to examine the relationship between the state of economic develop-

ment of the regions and their inner regional disparities. However, to address this issue, data at NUTS 3 or LAU 1 levels is needed.

As one of the most important conclusions, we need to state that despite the fact that the Visegrad Group has been in the European Union for 18 years, the closing of the gap in its regions happened with various speed, and no harmonised development can be observed within the Group. Moreover, in many regions the process of closing the gap cannot be even proved unequivocally.

We need to highlight the fact that our outcomes coincide with the results of other authors as it could even be seen in the bibliographic overview of our paper. Therefore, our results and conclusions are merely in harmony with them. We need to agree with others that though the role and importance of the EU's cohesion policy and instruments cannot be questioned, they cannot replace national development policies and own development strategies of the regions that could address the mitigation of the discrepancies.

Therefore, in order to propel the lagging regions (especially in the eastern parts of the Visegrad countries) onto a speedier trajectory of development, more target-oriented development programmes are needed in harmony with the European Union's cohesion policy priorities and instruments, like the European Regional Development Fund or the European Territorial Cooperation programmes. We can observe similar tendencies in regions across the borders within the Visegrad group, which means that the role of cross-border initiatives must get more attention in policy making. It is also recommended to elaborate an incentive system for FDI investors to deploy not only manufacturing job-creating plants but also investments that can bring about an increase in the added value and R&D activities. This may be more efficient by clustering with local suppliers and subcontractors, and also by a win-win type of integration between companies, and education and research centres. Multinational companies are able to generate sustainable growth in the regions in which they settle if they emulate the increasing rate of embeddedness in the local economy. While there are promising examples (e.g. Daimler-Benz and Neumann János University in Kecskemét, Hungary), we believe there are still too many white spots to be covered by similar initiatives to accelerate the process of closing the gaps and to diminish the regional disparities.

5.1. Future studies and the limitations of the study

Despite the fact that this study has its limitations, it was intended to contribute to the group of studies that focus on the existing regional discrepancies within the Visegrad Group, as well as the need for strategies aiming at the mitigation of regional economic and social inequalities. Since the convergence of the four countries is the key to sustainable development, future studies are needed to find out more about region-specific resources and potentials.

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Tadeusz MARSZAŁ *

GERMAN IMMIGRANTS IN CENTRAL POLAND IN THE LATE 18TH AND EARLY 19TH CENTURIES

Abstract. The aim of this article is to provide a holistic presentation of the genesis, intensity, and directions of movement, as well as the spatial and temporal distribution of the German national group which settled in Central Poland from the end of the 18th century to the 1820–1830 period. This paper analyses the determinants of the inflow of German immigrants, and their geographical origin, as well as the social and occupational structure. The settlers from German lands were a very diverse social group. In the case of first and second-generation immigrants who came to Central Poland, the social integration process was still quite slow. The colonists and settlers living in the diaspora developed a certain pattern of existence that focused on their immediate environment separating them from the outside world, while the retention of their mother tongue and religious tradition was more an expression of traditionalist consciousness than national identity.
Key words: German settlement in Poland, Central Poland, Łódź province, geography and history of migration.

1. INTRODUCTION

The theme of German settlement in Poland has been the subject of numerous publications authored by Polish and German historians. The reasons and circumstances surrounding migratory movements have been discussed at length, yet little attention has been given to the spatial aspects of the phenomenon. Information

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regarding the directions of migration and locations of exile and settlement which appeared in texts devoted to Germans arriving in Polish territories provided merely a cursory view into the demographic, social, and settlement spatial structures of the German minority in Poland which took shape in the 19th century.

The purpose of this paper is to provide a more holistic presentation of the genesis, intensity, and directions of movement, as well as the spatial and temporal distribution of the German national group which settled in Central Poland from the end of the 18th century to the 1820–1830 period.[1]

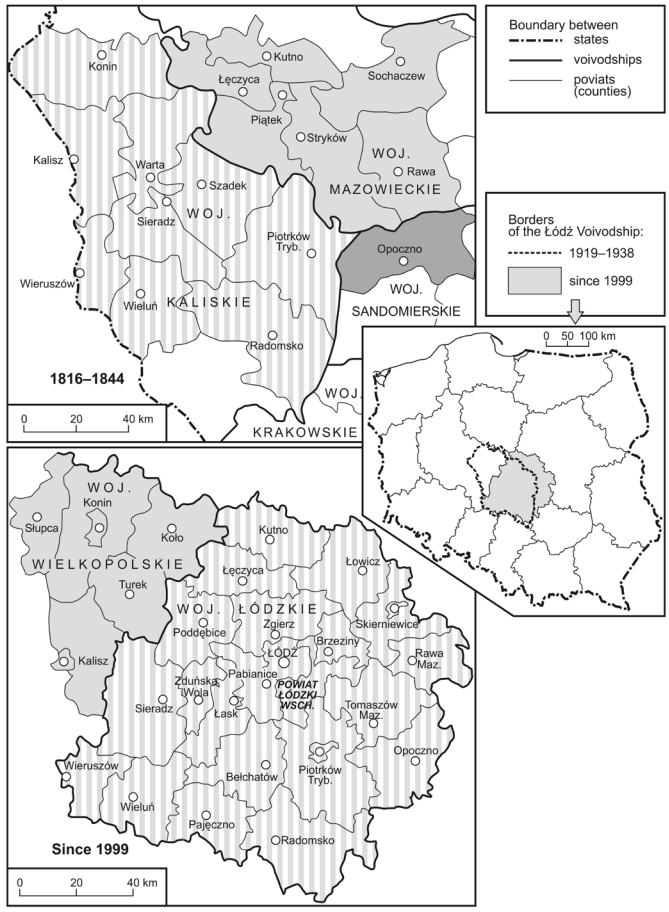

Fig. 1. Administrative division of Central Poland from 1816 to 1938 and since 1999 onwards

Source: own work.

[1] The subject matter was presented in a broader time frame, from the end of the 18th century until World War II, in the publication: Marszał, T., *Mniejszość niemiecka w Polsce Środkowej. Geneza, rozmieszczenie i struktura od końca XIII w. do II wojny światowej*, Łódź 2020.

The assumed spatial scope of this paper basically covers the territory of Central Poland. State borders and internal administrative divisions of the Polish territories underwent multiple changes since the partitions. The notion of Central Poland, which has been gaining significance in scientific literature, is in principle equivalent to the Łódź region. In this study, the regional scope is defined by the borders of today's province (voivodeship) of Łódź, supplemented by the areas of several counties (poviats) belonging to the province before World War II[2], and currently located in the province of Greater Poland (Wielkopolska) (see Fig. 1).

2. GERMAN SETTLEMENT IN THE PERIOD OF THE COMMONWEALTH OF POLAND

German settlement and the related processes of cultural permeation and transfer of new models and values to Poland date back to the Middle Ages. For centuries, Germans inhabited Poznań, Pomerania, and Upper Silesia, creating more or less tightly knit ethnic groups. The processes of medieval German colonisation also left their mark in Central Poland. Waves of the first emigrants from the shores of the Rhine River headed towards the poorly developed lands in the basin of the Warta and Vistula rivers.[3] The migrants who settled in Central Poland in the Middle Ages gradually became assimilated and in time completely Polonised. By the 16th century, the German minority in Polish cities was relatively small (Inglot, 1945, p. 64).

An influx of German settlers to Poland was noted during the Reformation, brought about by increasing religious persecution in the western part of the continent; meanwhile, the territory of what was then the Polish-Lithuanian Commonwealth enjoyed religious and national tolerance. In the 17th century, Hollander settlements quickly spread to the wetlands in the Vistula valley, on to Greater Poland and other parts of the country, including what is now the region of Central Poland. Initially, native Mennonites, the Dutch, Flemish, and Frisians were the prevailing immigrant groups, which gradually became Germanised. In the decades that followed, the ethnic composition of the settlers changed and ever so often the villages in the river valleys were settled by migrants originating mainly from northern Germany. Hollanders of

[2] For more on the scope and changes to the borders of the Łódź province, see: Sobczyński, 2000, pp. 7–21.

[3] An important centre concentrating the German population at the turn of the 14th century was Pyzdry located in the valley of the Warta river, along with the monasteries in Ląd (Warta valley) and Ołobok (Prosna valley) run by German monks. Germans inhabited the main cities of the region: Łęczyca, Sieradz, Szadek, and Brzeziny.

German nationality[4] who came to the territory of Central Poland in the 18th century also originated from Brandenburg, West Pomerania, Saxony, Greater Poland, and Silesia. The destruction of Germany caused by the Thirty Years' War (1618–1648) further intensified migration movements. The depopulation of Polish lands caused by numerous wars with Sweden, Russia, and Turkey also contributed to the influx of migrants from beyond the western border. Many villages were devastated, and the population was decimated by numerous plagues. As a consequence, areas which were previously cultivated for agriculture remained undeveloped. The development of Hollander settlements was one of the remedies to this situation.

Some time later, an influx of German people to Polish cities was noticeable. One of the several new urban centres that appeared in Central Poland in the first half of the 18th century was Władysławów, whose owner brought weavers from Bohemia and Saxony.[5]

German colonisation, which was spontaneous until the mid-18th century, significantly increased towards the end of the 1700s. In German territories, the concentration of land ownership in the hands of large owners and the economic stratification of peasants was becoming ever more visible. Living conditions in the overpopulated German territories became more and more difficult for the poorer population (Śladkowski, 1969, p. 118). At the same time, in the less populated Polish territories, economic development processes were initiated, which, in the absence of qualified personnel and capital, required support from the outside.

In the second half of the 18th century, the growing influx of economic immigrants to Poland from Germany mainly concerned agricultural colonists, who in particular headed in great numbers to the economically underdeveloped territory of Central Poland. This settlement intensified in the final two decades of the 18th century, when many new settlements were established in royal and private estates, inhabited by a German-speaking immigrant population. Quite often, the goal of the colonisation process was to restore economic functions to abandoned land, which had been excluded from use for many years. Yet in most cases, the Hollander villages in Central Poland were created 'from scratch', in areas not previously subject to settlement expansion.

The Hollander economy was definitely a cut above the economy of the serfs. It had greater efficiency, and the surplus production was sent to the market, contributing to the development of trade contacts between the country and the city. The inflow of German colonists in the pre-industrial era, both to rural areas and

[4] The term 'Hollanders', which was quite unambiguous in the 16th century, gradually lost its original meaning as the Dutch were replaced by newcomers from German lands. In time, the term 'Hollander' began to refer not so much to the nationality of the settlers as to their legal status, the nature of the activities they undertook, their management methods, and the social structures they created. A 'Hollander' was a free peasant/tenant holding tenure of a farm.

[5] For more on the development of other production centres in the 18th century in eastern Greater Poland, see: Goldberg, 1968, pp. 55–85.

to cities, had substantial civilisational and cultural significance. It enriched Polish culture with new models that proved key for social and economic development and left their mark in many areas of life.

3. CENTRAL POLAND UNDER PRUSSIAN RULE

The second partition of Poland in 1793 meant that nearly the entire area of today's Central Poland was within the borders of the Prussian state. A new province called South Prussia was created on the seized lands. The Prussian authorities introduced a number of legal regulations that were key for the relocation of the German population to the occupied territories. A decision was made to secularise church property and nationalise royal lands. Frederick William III ordered the development of colonisation plans for each of the provinces. That in turn paved the way to yet another stage of the inflow of German settlers to Central Poland (Breyer, 1941, p. 47). Meanwhile, Hollander settlement continued to develop in private estates (see Woźniak, 2013, pp. 96–99).

The Prussian colonisation was a *de facto* continuation of the settlement processes related to the Hollander colonisation during the pre-partition period[6]. The initial efforts were geared towards populating abandoned peasant farms. With time, the settlement campaign organised by the Prussian administration included the former estates of the Polish treasury. German peasants were also placed in noble estates repossessed for debts. The settlement of Polish lands with German settlers was connected to the implementation of the economic and political goals set by the Prussian government, while the goal of the spatial redistribution of the German population was to bring East Prussia and German Silesia closer together.

In 1798, a large-scale campaign was launched to encourage the inhabitants of the crisis-stricken region of Baden and Württemberg to migrate to sparsely populated South Prussia (see Woźniak, 2013, pp. 80–81). The Prussian government also tried to recruit settlers from Mecklenburg, taking advantage of the fact that in this region, from which fugitive peasants had long been migrating to Poland, the action of ousting peasants from their land was intensifying (Nichtweiss, 1954, pp. 122–127; Pytlak, 1917, p. 9). The authorities provided all peasants settling in South Prussia with significant allowances and financial aid; each settler was reimbursed for travel expenses and granted several years' exemptions from taxes and military service (Smoleński, 1901, p. 214).

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[6] The essence and nature of these processes have been presented in the article: J. Wąsicki, "Kolonizacja niemiecka w okresie Prus Południowych 1793-1806", *Przegląd Zachodni* Year 8 (9/10), 1953, pp. 137–179.

In the first period, settlers headed mainly to the Poznań region, and only a handful reached the Hollander villages in the Łódź region (Woźniak, 1993, p. 120). An organised and more massive influx of German settlers to Central Poland began in 1800. These were farmers, coming mainly from Württemberg, but also from Baden, Prussia, Bavaria, Neumark, Bohemia, and the Poznań region. The newcomers settled in existing villages or in newly established settlements.

Gradually, owners of private estates joined the government's initiative to bring in colonists. Among the immigrants there were also handicraft weavers who founded the first textile settlements in Central Poland. In the years that followed, groups of new settlers increasingly included migrants from the south-western territories of Germany (Swabia, or, specifically, Baden, Hesse, Palatinate, and Württemberg). The new settlers were exempt from any payments, with the exception of rent paid after 3–6 years.

The greatest intensification of the Prussian colonisation campaign was between 1801 and 1806. This settlement activity indeed contributed to the economic revival of areas where new settlements were concentrated. German settlement in the Prussian period was essentially of an agricultural nature (although glassworks were also being established in many places) (Friedman, 1933, p. 115) despite the fact that settlers coming to cities could also count on the support of the Prussian government, including the reimbursement of travel costs, exemption from taxes and military service, and possibly a grant to open a workshop (see Smoleński, 1901, p. 215). Dąbie was the only town in Central Poland where, by dint of the influx of German craftsmen, cloth-making was developing on a larger scale since 1798 (see Friedman, 1933, p. 98).

Wąsicki estimates that between 1793 and 1806, around six thousand rural colonists settled in South Prussia on an area of 15,900 hectares (Wąsicki, 1953, pp. 137–179; 1957). Much larger numbers were cited by Z. Kaczmarczyk, who wrote that 13,800 people settled in South Prussia, of which 5,500 inhabited cities (Kaczmarczyk, 1945, p. 182). Other data claims that between 1802 and 1804 alone, 7,500 people migrated to South Prussia from German lands (Simsch, 1983, p. 222 et seq.).

At the end of the Prussian period (including earlier pre-1793 settlement), the Łódź region had a total of 14,200 farms situated in over 300 German settlements (referred to as 'Swabian' settlements, i.e., 'Schwabensiedlungen') inhabited by around 83,000 people (Heike, 1979, pp. X–XI). The settlements located in Central Poland were dominated by people from Swabia and Upper Franconia. The share of immigrants from Pomerania was quite significant, as it exceeded 1/3, while about 8% of the settlers came from Baden and Württemberg (Heike, 1979, p. IX).

As a result of military operations led in Poland in 1806 and 1807 and the loss of property, as well as the agitation of the Russian government, some settlers decided to migrate further east. Colonists who inhabited the areas that were most damaged during the war of 1807 were the most economically solid group of the peasantry, yet they became unable to meet their obligations to the Court and State,

so they would sell their livestock and real estate for next to nothing and move to Russia, where they were given better conditions and were allotted large areas of land (cf. Mencel, 1959, pp. 136−137).

4. THE DUCHY OF WARSAW

The establishment of the Duchy of Warsaw in 1807 (inhabited by over 10,000 German settlers who came there during Prussian and Austrian rule (Pytlak, 1917, p. 19)), which remained in union with the Kingdom of Saxony, brought about further economic development. The government of the Duchy continued earlier policies favouring the inflow of foreigners (Zdzitowiecki, 1948, pp. 428−430), mainly professionals, craftsmen, and farmers. Despite numerous incentives, the influx of new immigrants was limited and textile production in Central Poland remained underdeveloped. Yet the policy of the government was met with some interest from certain private landowners who took actions to settle German clothmakers.

The period of the Duchy of Warsaw brought a new stage in the colonisation of rural areas – the settlement campaign planned by the Prussian government was replaced by a spontaneous and rapid influx of German peasants to Central Poland. Additional farming colonies were established or existing ones expanded, and then settled by the German population, mainly in private estates, while the inflow of settlers to state-run estates was much weaker.[7]

Some of the settlers, who did not manage to establish themselves in their new homes as the end of their rent-free period was approaching, decided to leave the newly inhabited settlements and emigrate further. Napoleon's defeat in the war with Russia and the years of the Russian occupation (1813–1815) resulted in the migration of an unknown number of German settlers to regions located deep in the Romanov empire. As a result of the recruitment campaign organised by the Russian authorities to encourage migration to the territory of the Empire, around 400 German settler families left the Duchy after 1813 and assumed farms in Bessarabia[8].

The turn of the 19th century was a period of the influx of German colonists, mainly to the rural areas of Central Poland, although there were migrations of craftsmen of German nationality (albeit initially marginal) to urban centres where the clothmaking industry was gradually developing. Up to 1815, craftsmen of German nationality ran clothmaking shops in over a dozen locations in central Poland (see Fig. 2).

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[7] Estimates show that 254 settlements were inhabited in the Duchy of Warsaw between 1807 and 1815, see: Pytlak, 1917, pp. 73–74.

[8] By August 1814, nearly 1200 families, or around 6,000 people, received permits to leave the Duchy, see: Woźniak, 2013, p. 120.

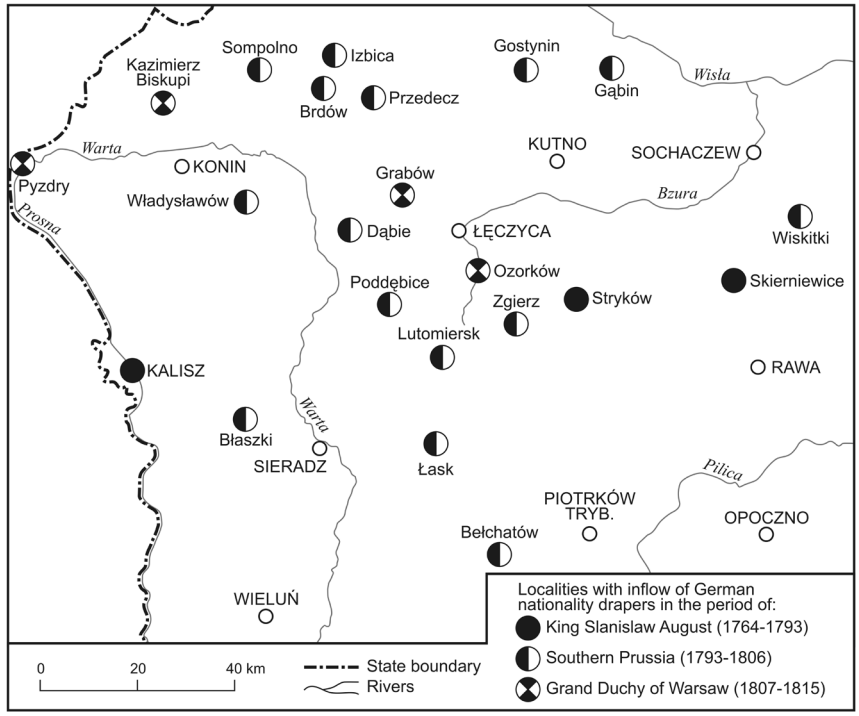

Fig. 2. Centres in Central Poland that noted an influx of clothmakers of German nationality up to 1815

Source: own work based on Kossmann, 1978, p. 244.

The most spectacular example of growth was the development of Ozorków, a village for which a development plan was prepared in 1807 at the village owner's initiative to establish an industrial settlement. As a result, streets and plots of land were marked out for German clothmakers brought in from Dąbie. In June 1811, 64 clothmaker families settled in Ozorków, and their number increased to 117 by 1815 (including several families who had come from Saxony).[9]

Over 90% of the German settlers who arrived in the second half of the 18th century and at the beginning of the 19th century were Lutheran. The first Augsburg Evangelical parishes in Central Poland were established in the 1770s (in Władysławowo and Stawiszyn). In the following years, Lutheran parishes appeared in places of larger concentrations of German settlers. By the establishment of the Duchy of Warsaw (until 1807), six parishes were established[10], with four more appearing between 1808 and 1815[11].

[9] In 1816, Ozorków obtained the status of a private city.

[10] In Kalisz (1795), Babiak (1796), Grodziec (1796), Brużyca Wielka (1801), and Dąbie (1806).

[11] In Prażuchy (1808), Sobiesęki (1808), Łask (1809), and Ozorków (1814).

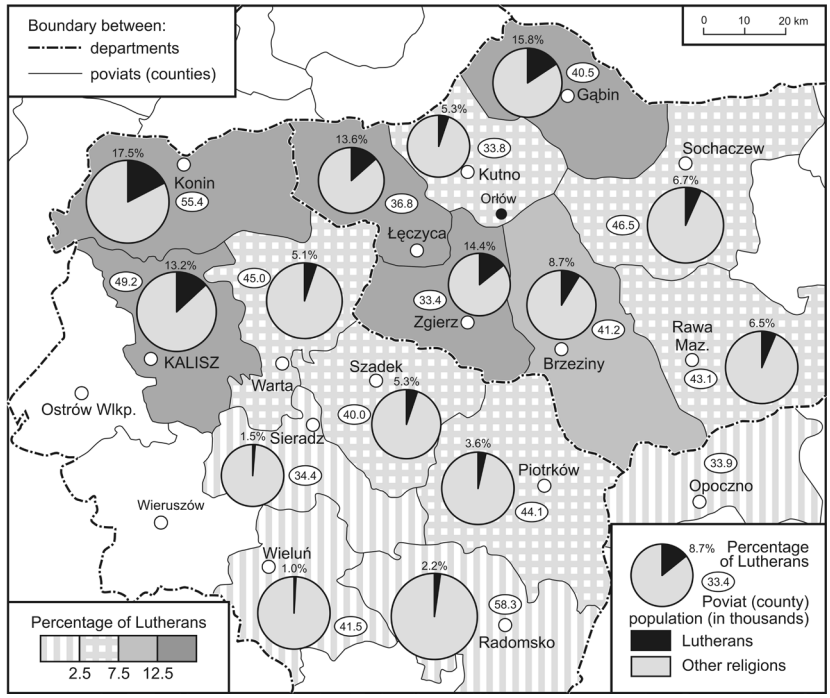

Fig. 3. Spatial distribution of the population of Augsburg Evangelical denomination in Central Poland in 1810 by county (poviat)

Source: own work based on Grossman, 1926, pp. 46–48, and *Das ehemalige Königreich…,* 1872.

In 1810, 363,300 representatives of the German minority of Augsburg Evangelical faith lived in the Duchy of Warsaw, constituting 8.3% of the total population[12]. In 1810 in Central Poland, in an area which included parts of the Kalisz and Warsaw departments and Opoczno county/poviat (Radom department), out of 667,100 inhabitants, 51,900 were of the Augsburg Evangelical faith, while only 1,300 belonged to the Reformed Evangelical church. In Kalisz with a total population of 7,300, which was the largest urban centre in the region at the time, the number of Lutherans reached 1,500 (Grossman, 1926, pp. 46−48). The Protestant population was concentrated mainly in the northern and north-western counties (poviats) of Central Poland: Konin (9,700 Protestants), Kalisz (6,500), Gostynin (6,400), Łęczyca (5,000), and Zgierz (4,800). At the same time, these were also counties in which Lutherans constituted the largest percentage of inhabitants, reaching 13–18% (see Fig. 3).

[12] The largest number of Augsburg Evangelicals lived in the departments of Poznań (138,500) and Bydgoszcz (107,700), and somewhat less in the departments of Warsaw (35,000) and Kalisz (32,800).

5. EARLY YEARS OF CONGRESS POLAND (1815–1830)

Established after the Congress of Vienna in 1815, the Kingdom of Poland occupied an area of 128,500 sq. km and had a population of nearly 3.3 million. The placement of the Kingdom's western border, adopted at the congress in Vienna, meant that all the well-developed centres of textile production in Greater Poland were located outside its borders, on the Prussian side. At the time of its establishment, the Congress Kingdom was still an agricultural country with marginal textile production, which was already well-developed in neighbouring countries. Small craftworks producing fabrics and canvases that existed at the turn of the third decade of the 19th century in many urban centres in Central Poland was focused solely on meeting local needs (Różański, 1948, pp. 195−199).

The pro-immigration policy initiated during the Duchy of Warsaw period was continued by the authorities of the Kingdom of Poland in an effort to address low population density and a lack of a qualified workforce. The German population which migrated to Central Poland from abroad on the initiative of the government and private landowners settled both the colonised rural areas and the newly emerging factory settlements.

After 1815, agriculture was in a particularly difficult situation, having been heavily damaged by warfare. Populating the empty spots in government-owned properties was supposed to help boost the economy. The ineffectiveness of the serfdom system also brought about a growing interest of the nobility in the use of hired labour. To increase their income, they would place colonists in private estates, both in non-cultivated areas and areas claimed from ousted peasants.

The publication on 2 March 1816 of the *Decision on the settlement of useful foreigners - manufacturers, craftsmen as well as farmers* encouraged migration to the Polish territory. This law guaranteed immigrants, farmers, and craftsmen, who had settled in the Kingdom:

– a six-year exemption from all charges and taxes;
– exemption from military service;
– the possibility of obtaining a passport to return to their home country;
– customs duty exemption on imported livestock and movable property.

These incentives were supplemented by the decision adopted in the same year on the creation of a fund for the development of industry on the Polish territory; money from the fund could be used to establish factories, build houses for craftsmen, and regulate factory settlements, as well as for loans and grants for 'useful foreigners.' (Gąsiorowska, 1965, p. 71). Government cities were designated in Central Poland that were to become industrial centres in the future (see Fig. 4). The government's actions encouraged similar efforts by private estate owners to settle foreign craftsmen and develop industry[13].

[13] Industrial colonisation gained the interest of Ignacy Starzyński – owner of Ozorków, Mikołaj Krzywiec-Okołowicz – owner of Konstantynów Łódzki, Rafał Bratuszewski – owner of Aleksandrów

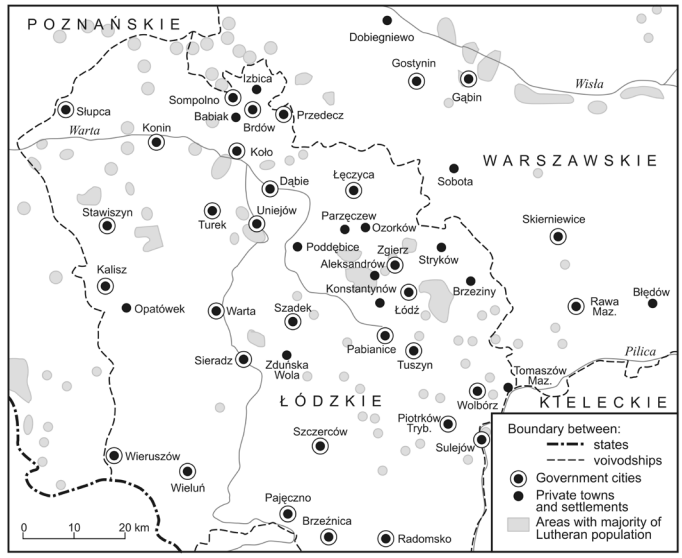

Fig. 4. Cities and settlements designated for industrial development in Central Poland in the 1820s
Source: own work.

From the point of view of colonists claiming the farms, the legal conditions under which they were given land for use were quite important. These conditions differed significantly from the rules of land use in serf villages. The settlers received plots of land on the basis of hereditary leases; after several years of exemption, they were obligated to pay a specified amount of rent to the land owner. The leased land could be inherited or sold.

The legal situation of industrial settlers in the Kingdom of Poland was secured by contracts, which guaranteed them numerous concessions and financial support. The government attached particular importance to the construction of water facilities, fulling mills, and bleaching plants, and supported these investments both organisationally and financially. So it was no wonder that already "by mid-1824, encouraged by the numerous privileges offered by the local government and the success of their compatriots, crowds of artisans from Bohemia and Saxony appeared in Poland." (Flatt, 1853, p. 72)

As soon as the early 1820s, the government of the Kingdom of Poland launched large-scale activities to promote settlement. Recruitment campaigns were renewed several times. The government sent emissaries to all key Prussian, Saxon and Czech production centres, and their chief task was to bring industrial settlers.

Łódzki, Count Antoni Rawita Ostrowski – owner of Tomaszów Mazowiecki, Stefan Złotnicki – owner of Zduńska Wola, as well as the owners of, Izbica, Opatówka, and Staszów, among others. See: Lorentz, 1928, p. 51, and Friedman, 1933, p. 103.

As a result, more and more craftsmen of German nationality settled in cities, where they assumed the role of industrialisation pioneers. Settlement in rural areas was also developing.

All these actions taken by the Polish government would have been much less effective had it not been for the difficult economic situation in German countries in the first decades of the 19th century. In Mecklenburg, Pomerania and other areas inhabited by the German population, the acreage of manor farmland was being increased at the expense of peasants who were being ousted from the land. Tax burdens grew and army conscription was a troublesome affair. Social inequality among the peasants was becoming more and more pronounced – the rich expanded their farms while the poor became free farm workers[14]. A large group of impoverished peasants evolved in Prussia, who were at times completely deprived of land. For them, the only option was to look for means of subsistence in exile. Even in the densely populated regions of Baden, Bavaria, Württemberg, and the Palatinate with high land fragmentation, social inequality among the peasantry was gradually increasing, thus prompting poorer groups to emigrate.

At the same time, in the field of non-agricultural activities, the increasing impoverishment of craftsmen was becoming key[15]. The difficult situation of German craftsmanship was caused by the competition that came from cheap, machine-made English products and the prohibitionist customs regulations that severed them from traditional Polish and Russian outlets. The situation was further aggravated by a long-lasting crop failure (1809–1816) and a famine in Württemberg and Hesse[16].

After the introduction of a customs tariff by Russia, the situation of small producers in Silesia, Brandenburg, and the Poznań region worsened.[17] The collapse of many handicraft factories in Saxony, northern Bohemia, and Silesia was accelerated by the progressive mechanisation of textile production.

While the migration from the German lands of people affected by the economic crisis was spontaneous, the influx of settlers to Polish territories who headed to private estates, as well as government and church properties, was the result of a well-thought-out economic policy, which was facilitated by a large supply and low price of land in the Kingdom of Poland. The migration of professionals to Central Poland was associated with the implementation of new knowledge regarding management, in the realm of both agricultural and non-agricultural activities.

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[14] This phenomenon intensified between 1807 and 1811, after the introduction of a land reform in Prussia.

[15] To find out more about the situation of the weaving craft in Germany in the 19th century, see: Schmoller, 1873.

[16] These particular reasons for migration to the territory of Central Poland are often overlooked in German historiography, see: Woźniak, 1997, pp. 17–18.

[17] Between 1816 and 1831, the number of clothmaking shops in Prussia decreased from 43,000 to 36,700, and in Silesia from 16,200 to 12,300, see: Wobłyj, 1909, p. 197.

The activities of the Polish government, aimed at the development of the country's economy and promotion of industrialisation, found support from the likes of highly entrepreneurial landowners seeking to introduce new, more effective management systems on their private land.

From the viewpoint of the development of the textile industry in the Kingdom and the associated settlement of German craftsmen, a return to protectionist policies and the introduction of a protective tariff on the import of textiles from Prussia was a key factor. The establishment of a customs union with Russia with its own protectionist policies was an equally important goal. By obtaining a guarantee of preferential customs tariffs, the Kingdom could secure access to absorptive markets in the East. The growing absorption of the internal market and government orders for the military also played a key role in the creation of demand for textile products.

6. GEOGRAPHICAL ORIGIN OF IMMIGRANTS

The geographical origin of migrants arriving in Central Poland in the period prior to the Uprising was quite diverse. Above all, they came from Saxony, Württemberg (Swabia), Silesia, Bohemia, Mecklenburg, Prussia, and Hesse, as well as from the territory of the Grand Duchy of Poznań. At the same time, highly qualified professionals headed to industrial settlements, usually on a temporary basis, included people from other Western European countries, such as France (Lorraine and Alsace), Belgium, Switzerland (dyers), and England (mechanics).

At the turn of the 1820s, most of the industrial settlers came from the Prussian partition (Poznań, Lubuskie region), Pomerania, Brandenburg, and Silesia (Missalowa, 1964, p. 60). The migration of craftsmen from the crisis-stricken linen industry in Silesia intensified between 1826 and 1830. From 1827, a growing influx of newcomers from West Prussia was observed (Missalowa, 1964, p. 66). From 1824 to 1830, numerous craftsmen, mainly of German nationality, came from the Sudeten textile production regions of Bohemia and Moravia.

Many industrial settlers came from Saxony where the government pursued a liberal migration policy and where the textile industry, strongly developed in the 17th and 18th centuries, was experiencing difficulties after the loss of eastern outlets and in the face of increasing competition from English products. The impoverished Saxon weavers massively migrated to the Kingdom of Poland from the mid-1820s until the outbreak of the November Uprising in 1831 (and later between the Uprisings, from 1837 to 1844) (Missalowa, 1964, pp. 76, 83). Most of them headed for Łódź and the nearby centres of textile production.

The first settlers to appear in Łódź were Saxons and Germans from Bohemian territories (northern Bohemia)[18]. Migrants coming in the following years to Łódź, which was a rapidly growing industrial centre, mainly came from: Prussia (Brandenburg) and Lower Silesia[19], Saxony – especially its eastern part[20], Bohemia[21], and the Duchy of Poznań[22] (see Rynkowska, 1958, p. 53).

As the settlers often came in tight-knit groups, many localities in Central Poland were inhabited by newcomers from the same region.[23]

7. SOCIAL AND OCCUPATIONAL STRUCTURE OF GERMAN SETTLERS

The social and professional structure of the settlers coming to Central Poland in the decades that followed clearly differed from that of the migrants arriving at the turn of the 19th century. In the first three decades of the 19th century, along with the increasing scale of migration, representatives of agricultural professions constituted an ever smaller share of the total number of settlers, while the influx of craftsmen was rapidly increasing.

Despite the fact that textile production was dynamically developing, in the initial phase of industrialisation in the 1820s, the transition of agricultural colonists

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[18] In the first settlement in Łódź, i.e., 'Łódka', settled from 1825 to 1830, about half of the migrants came from Saxony, around 1/3 were immigrants from Bohemia, while the rest were nearly only newcomers from Prussian Silesia. See: Rynkowska, 1951, p. 34.

[19] This included Jelenia Góra and the surrounding areas (Wojcieszyce, Barcinek, Kowary), Kamienna Góra and the surrounding areas (Błażków, Okrzeszyn, Marciszew), Bolków and the surrounding areas (Bogaczowice), Dzierżoniów, Bielawy, Kowary, Zielona Góra, Świebodzin, as well as Lutomin, Chełmsk Śląskio, and Głupczyn.

[20] This included Dresden, Sohland and the surrounding areas (Schmölln, Taubenheim), Zittau and the surrounding areas (Bertsdorf, Königshain, Oderwitz, Weigsdorf, Leutersdorf, Spitzcunersdorf, Josephsdorf) Neugersdorf, Kamenz, as well as Gross Schönau, Stoplen, Löbau, Waldorf, Gersdorf, and Schönbrunn, Chemnitz and Johann Georgenstadt located in the south.

[21] This included Rumborg and the surrounding areas (Brtniky, Benešov n. Pl., Haňšpach, Chřibska, Falknov, Jehlična, Tešnov, Rybniček), Varnsdorf, Liberec, Trutnow and the surrounding areas (Chotěvice, Huntiřov, Rtyně, Chvaleč, Adršpach, Vernířovice, Police n. M.), as well as Litomierzyce and the surrounding areas (Haslice, Zitenice, Čeřeniště, Třebušin) and the following localities: Falnov, Cvikov, Žandov, Č. Lipa, Mimoň, Frydland, Jilemnice, Rokytnice n. J., Žacleř, Broumov, Horni Litvinov, Nachod, Starkov, Heřmanice, Hvězdov, Pihel, Svřice, Vitkov, Domousnice, and Stary Jiřkov.

[22] Including Chodzieszyn, Gniezno, Strzelno, Studziny, and Bojanów.

[23] For example, Aleksandrów Łódzki was inhabited by migrants from around Zielona Góra, while Łaznowska Wola (Grömbach) was popular with newcomers from Grömbach, a locality in Württemberg, and its surrounding areas. The analysis of the geographical origin of the German colonists settled in the localities of the Łódź region clearly documents the spatial concentration of the places from which the migrants who settled in each of the colonies originated. See: Kossmann, 1937, pp. 329–342.

to jobs in textile processing was previously unheard of. Rural settlements settled by German immigrants were usually sparsely populated, with a predominance of poor people primarily interested in the cultivation of land obtained under favourable conditions. Thus, agricultural colonists could not constitute significant support for developing production centres (see Woźniak, 1993, pp. 113–130).

Most of the Germans who migrated between 1815 and 1830 were industrial settlers – specialists in the field of textile production included weavers, and spinners, as well as particularly sought-after fullers, combers, and dyers. Representatives of other professions also came, including bricklayers, carpenters, workshop manufacturers, saddlers, etc. Clothmakers dominated in the first wave of migration. The following wave of migrants included specialists in the production of cotton products, while linen canvas manufacturers appeared at the very end.

The first wave of industrial settlers were craftsmen and small industrialists from the eastern provinces of Germany who needed government support, yet most of them had the required qualifications to engage in production activities. The most numerous group among the industrial settlers were small producers who only on occasion employed a few journeymen or makers. Along with the qualified workforce, foremen and journeymen, large groups of unskilled makers appeared, who came mainly from Prussia. Many of the newcomers were people who were not proficient enough in their profession, so to make sure that government expenditures for the settlers would not be wasted, a regulation was introduced already in March 1819 which stated that migrants could obtain a permission to settle only if they previously confirmed their wealth or their knowledge of the profession (Woźniak, 1993, p. 129).

The level of wealth of the earliest migrants was not significant enough to ensure the implementation of the ambitious assumptions of the government policy aimed at the development of large-scale textile production which would enable effective competition with the rapidly developing textile industry in Western Europe. The government of the Kingdom of Poland was not able to meet the growing credit needs of the massively migrating clothmakers, while the commissioning of larger and more specialised factories required the involvement of foreign capital. Therefore, efforts were made to recruit industrialists with more available capital from Saxony, Bohemia, and Prussia[24]. Attracting wealthier factory owners meant that the earlier economic equality among the settlers was swayed and small producers, often operating in the outwork system, became a link in the production chain dependent on wealthier entrepreneurs.

[24] These actions were quite effective though, in the mid-1820s. New residents of Łódź included Fryderyk Wendisch from Kamienica Saska (Chemnitz), Daniel Ill from Groschönau in Saxony, Jan Traugott Lange from Kamienica Saska (Chemitz) in Saxony, Ludwik Geyer from Neugersdorf near Lobau in Saxony, Tytus Kopisch from Schmiedeberg in Lower Silesia and Wilhelm Zachert (English-born) from Międzyrzecz Wielkopolski, who settled in Zgierz.

8. NATIONAL AND RELIGIOUS IDENTITY OF GERMAN IMMIGRANTS

The strongest binding force of the agricultural colonists and craftsmen originating from the territory of the German Reich and bordering regions and settling in Polish territory was language and religion (Protestant faith) (see Woźniak, 1993, p. 11). For many years in Central Poland, they constituted a clearly distinguishable national group, in which acculturation processes occurred relatively slowly and only a small percentage of migrants in the first generation became Polonised. At least by the mid-19th century, the German diaspora maintained a particularly strong awareness of belonging to their 'small homelands' ('Heimat'), and settlers who migrated to Polish lands would define themselves as subjects of Prussia, Württemberg, or Saxony[25]. At the end of the 18th century and in the first half of the 19th century, people from Aachen, Saxony, Bavaria, or Prussia were completely different Germans, with a different sense of national affinity (cf. Śmiałowski, 1999, p. 209). Most of the settlers from Württemberg, Hesse, Baden, and the Palatinate were ethnic Swabians[26](Woźniak, 1993, p. 11), whose differences, which also included language resulting from the use of a specific Swabian dialect, were often an obstacle in communicating with the area, though they were also German (see Woźniak, 1993, p. 88).

Despite a clear sense of identity of their origins related to the attachment to their 'small homelands' and migration from various, not necessarily German regions, i.e., Saxony, Prussia, Silesia, Baden, Württemberg, Pomerania, the Bohemia, or Greater Poland, the vast majority of migrants settling in Central Poland were bound with German culture (Woźniak, 1998, p. 88). Upon arrival in Poland, they were cast into a foreign environment and by living in the diaspora, they showed a quite understandable tendency to strengthen mutual contacts, show solidarity in their attitudes, and cultivate tradition, language, and faith (see Śmiałowski, 1999, p. 210). This tendency to separate was reflected both in the spatial dimension, which was demonstrated by the way they concentrated within newly formed colonies and settlements, as well as in the professional sphere.

The German colonies in Central Poland in the early 19th century were quite hermetic, and the scope of contact between the settlers and the native Polish population was relatively small. Germans rarely settled in villages previously inhabited by the Polish population, and likewise, immigrants rarely claimed farms abandoned by Polish peasants[27].

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[25] This resulted from a completely different understanding of German nationality compared to the one developed later, in the Bismarck period. It was not until the Napoleonic Wars that Germans became aware of their national identity and started to feel a sense of loyalty reaching beyond dynastic allegiances. See: Wereszycki, 1986, pp. 23–24.

[26] Hence, in colloquial Polish language, the term 'Swabian' is seen as a synonym for a German.

[27] In the 1840s, a few colonies were established that were settled by both Polish and German peasants, mainly in the area of Kalisz; Polish tenants were also on occasion added to existing German colonies. See: Woźniak, *Niemieckie osadnictwo wiejskie …*, op. cit., p. 250.

In addition, contacts with cities by German colonists who settled in the countryside during the first decades of the 19th century were quite sporadic, which resulted from communication difficulties and quite frequently a significant distance from the nearest urban centre. A significant degree of self-sufficiency in the field of crafts that secured daily existence, was characteristic of the rural settlers; so this also limited the need for contact with the external world and strengthened the isolation of the rural German minority communities.

Among German immigrants representing non-agricultural professions, there was a clear tendency for separation in the sphere of professional and social activity, which was manifested by their reluctance to join already existing Polish-Catholic associations or craft guilds. Once groups of settlers built sufficiently strong clusters, they established their own German organisations[28]. In larger production centres, this led to the formation of a type of professional ghettos, isolated from the Polish society to a certain extent and characterised by its cultural, linguistic, and religious distinctiveness. The size of the clusters of German weavers, the guild traditions of crafts, apprenticeships, and the transition of workshops to children, as well as numerous economic ties with representatives of their own national group meant that many handicraft colonies in Central Poland (and especially in the Łódź district) retained their distinct character for a long time. The processes of acculturation and assimilation unfolded much faster in those regions where the number of settlers was smaller, contacts with the social environment were more extensive, and the professional structure of German migrants was more diverse (Wiech, 1999, pp. 107–108). The more dispersed clusters of German craftsmen, where second generation migrants often integrated with the Polish population, were losing the features typical of German factory settlements at a faster rate.

The gradually developing education system for the children of German settlers helped to maintain their sense of national identity. Already in the times of the Duchy of Warsaw, a network of Evangelical religious schools was developed with German as the language of instruction, with no Polish language instruction in the curriculum[29]. Nearly all the children of German-speaking settlers attended Evangelical schools at the beginning of the 19th century.

Assimilation processes were counteracted by the religious distinctiveness of the majority of the settlers who belonged to the Augsburg Evangelical Church, which became "A nearly exclusively German church." (Bursche, 1925, p. 23.) Religious affiliation, which usually has a hereditary character, became an element

[28] The first association established in Łódź in 1824 by German migrants was the Łódź Shooting Society (Lodzer Bürger Schützen-Gilde), also known as the Fowler Brotherhood. The Master House (Meisterhaus) was opened in Łódź in 1825 and it became the centre of social life of the settlers. The guild of clothmakers was also created, soon followed by the guild of cotton and linen weavers. See: Budziarek, 2001, p. 53.

[29] The introduction of obligatory Polish language instruction was hindered by the fact that teachers in those schools did not speak Polish. See: Winiarz, 1998, pp. 125–126.

of tradition that had an effect on cultural rooting and constituted a permanent component of social, and often national, consciousness. This factor was particularly important in rural areas inhabited by the more dispersed communities of German migrants. The religious community supported the integration of fellow believers living a certain distance away – the parish was the centre of religious life, as well as community, social, and cultural life, for settlers living in nearby villages (see Stegner, 1994, pp. 6–7). Marriages within one's own religious and national group contributed to maintaining national identity.

In the pioneer period that lasted until the end of the 1820s, assimilation processes were quite limited in scope, especially in places where the German minority formed larger clusters, and concerned a small number of people. Rather, those were times of the initial adaptation of the German environment to new, rapidly changing living conditions in a new place of settlement (Pytlas, 1996, p. 14).

9. SIZE AND SPATIAL DISTRIBUTION OF GERMAN SETTLEMENTS

According to various sources, the size and spatial distribution of German settlements in the Kingdom of Poland before the outbreak of the November Uprising were very diverse and difficult to verify. Estimates of the number of settlers range from 35,000 up to 300,000, where about 1/4 of the total number of migrants were agricultural colonists (see e.g., Bajer, 1958, p. 46). The source of these differences seems to lie not only in the ideological attitude of the authors, but also in different calculation methodologies[30]. A total of 300,000 settlers is an undoubtedly overestimated figure (including 250,000 between 1818 and 1828) as provided by the German researcher Gustaw Schmoller (Schmoller, 1873). At the same time, the figures provided by the Polish side, which spoke of 55,000 German immigrants (around 10,000 families) who arrived between 1810 and 1827, was vastly underestimated[31]. According to a report of the Minister of Religious Denominations and Public Education from 1823, there were 128,000 Evangelist immigrants in the Kingdom of Poland (without settlers of German nationality of other religions)[32]. Most likely, before the outbreak of the November Uprising, the territory of the Kingdom of Poland was inhabited by about 260,000 settlers of German origin who came during the previous 50 years (see Badziak *et al.*, 2014, p. 37).

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[30] One of the contentious issues affecting any attempt to provide any calculations regarding national groups is the differing and extremely complex approach to defining ethnic affiliation.

[31] See: Różański, 1948, pp. 185–201. Similar numbers were provided by J. Rutkowski in *Historia gospodarcza Polski (do 1864)*, Warsaw 1953, p. 289.

[32] According to Ginsbert, the number of emigrants in the Kingdom could be estimated at around 180,000. See: Ginsbert, 1962, p. 17.

In the period before the Uprising, German settlers came to the territories of Central Poland mainly in groups – brought by the government or private owners as part of a planned colonisation action – and created tight-knit agricultural or handicraft settlements. Individuals or families, whose places of settlement were more spatially dispersed, migrated less frequently. In 1818, the first weavers from Greater Poland, which was severed in 1815 from existing markets, settled in Brzeziny and Zduńska Wola, and in 1819 in Zgierz (Kaczmarczyk, 1945, p. 195). By 1830, German-speaking migrants found their way to practically every city or land estate. The migration of craftsmen to jobs in the clothmaking industry in the 1820s was facilitated by the fact that it was a continuation of the earlier influx of agricultural colonists from Germany, so newcomers arrived in a region where their compatriots had been settling for over three decades.

Immigrants seeking employment in textile production settled mainly in state-owned estates and were particularly willing to opt for government cities slated to be industrial centres, where unlike many settlements established on private lands, they could live for free. Industrial settlements established by private landowners that had not yet obtained municipal rights, were less popular; settlers feared the arbitrariness of private landowners, who sometimes imposed unfavourable provisions in their contracts.

The activities of the authorities of the Kingdom of Poland for economic activation were mainly focused on two provinces (voivodeships): Kalisz and Warsaw. The direction of the migration of professional craftsmen from Germany was greatly influenced by the decision of the Mazovia Province Commission of 1820 to allocate selected centres which had sufficient water resources needed for the operation of fulleries and dyeworks for the development of clothmaking. In the initial intentions of the government, the planned clothmaking district was to include Łęczyca as the main centre along with the surrounding cities (Zgierz, Łódź, Dąbie, Przedecz, and Gostynin). The authorities prepared plans for these cities. Plots were allocated for settlers, fulleries were established, and brickyards were built.

In the first period, Zgierz attracted the largest number of industrial settlers, where 230 plots of land were designated for a new handicraft settlement as early as 1821, while the number of inhabitants increased by almost 16 times to 8,900 people between 1815 and 1828[33]. Aleksandrów also saw a rapid development in the first half of the 1820s[34].

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[33] A total of 240 master clothmakers settled in Zgierz between 1821 and 1828. For more information on the origins of clothmakers settling in Zgierz, see Lück, 1934, p. 337.

[34] From 1821 to 1822, 113 colonist families settled in Aleksandrów (see Wróbel, 1988, p. 17), while the total number of master clothmakers who came between 1821 and 1825, mainly from Bohemia, Saxony, and Silesia, reached 181. For information on the origins of clothmakers settling in Aleksandrów, see Lück, 1934, pp. 37–338.

Foreign clothmakers in large numbers were accepted by many cities (government and private), including: Kalisz, Zduńska Wola, Sieradz, Zelów, Turek, Koło, Pabianice, Bełchatów, Zgierz, Konstantynów, Ozorków, Dąbie, Ksawerów, Tomaszów Mazowiecki, Brzeziny, and Łęczyca. At the same time, until the early 1820s, immigrants generally avoided Łódź, which had a typical agricultural character despite having municipal rights. The city was surrounded by a ring of German peasant settlements established at the end of the 19th and beginning of the 20th century.

The scale of the influx of immigrants to centres which were developing textile production was evidenced by the population increase during the fifteen year period before the Uprising in what was then the Mazovia province in the north-eastern part of Central Poland (see Fig. 5).

In the first period, the workforce factor had a decisive influence on the location of the newly created production centres, and craftsmen migrating from German lands mainly headed for locations closer to the western border of the Kingdom of Poland (in the Kalisz province). The years that followed brought faster colonisation by settlements further east (in the Warsaw province), with a vast majority of them located in the strip stretching along the western border of the Warsaw province (from Izbica to Tomaszów Mazowiecki) (see Ostrowski, 1949, pp. 34–35). The key determinants here were the outlets and the location of this region closer to the border with Russia, to where most of the textile production was delivered.

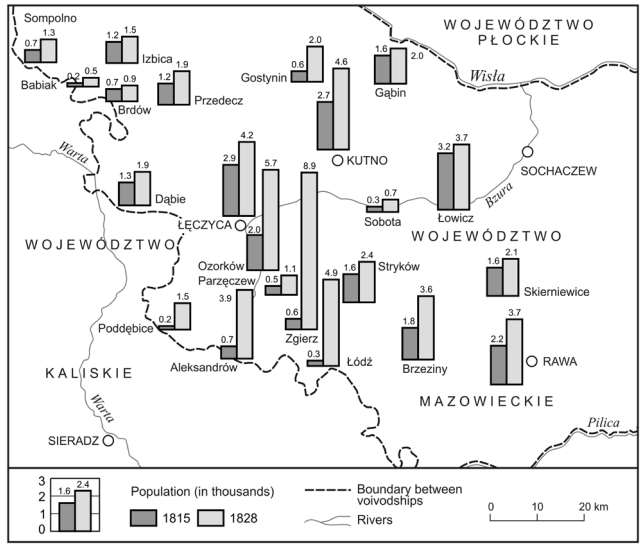

Fig. 5. Population growth in cities of Central Poland (Mazowsze province) between 1815 and 1828

Source: own work based on Lück, 1934, p. 336.

The influx of industrial settlers to Łódź, which had been avoided earlier, was initiated by the designation of 202 plots in the newly created clothmaking settlement called Nowe Miasto in 1822. The first group of immigrants arrived in Lodz in the autumn of 1823; among them there were about a dozen clothmakers and a comber from Saxony, as well as several construction experts to build textile workshops and houses. Nearly 200 skilled craftsmen settled in the city between1823 and 1825, most of whom (about 60%) were weavers. The establishment in 1824 of a settlement for cotton and linen weavers with 307 plots, and a settlement for linen spinners with 167 plots in 1825, led to rapidly increasing migration of skilled German settlers in the following years. The first cotton weavers arrived in September 1924. By the mid-1820s, Łódź became an attractive place to live.

The spatial development of the Łódź textile production centre was further complemented with the establishment of yet another settlement (weaving/spinning) called Ślązaki with 42 plots in 1828. All these actions initiated by the government resulted in the designation of 366 plots of land to immigrants arriving in Łódź by 1829 (see Lorentz, 1930, p. 183).

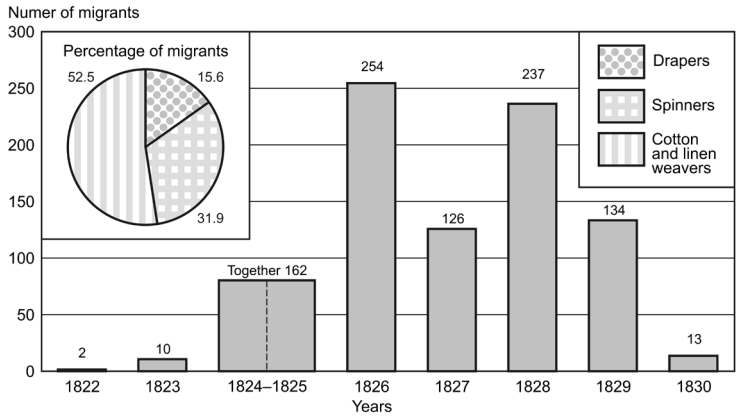

Fig. 6. Number and occupational structure of migrants settled in Łódź from 1822 to 1830
Source: own work based on Rynkowska, 1951.

In the 1820s, Łódź, which had a population of 799 inhabitants in 1821, saw the arrival of about 1,000 immigrant craftsmen, meaning that around 4,000 people of their nationality settled in the city[35]. The period from 1826 to 1829 saw a particular increase in the influx of migrants, dominated by cotton-linen weavers (cf. 6). As a result of the population processes occurring in the 1820s, the national structure of Łódź changed completely; at the turn of the 1830s, it became a multinational city

[35] According to A. Rynkowska, about 3,500 immigrants came to Łódź between 1823 and 1830. See: Rynkowska, 1951, p. 31.

with a large proportion of Germans and one of the main centres of the German population in Central Poland[36]. In 1839, as many as 68% of the permanent inhabitants of Łódź were allochthoons (people born outside the city) (Kossmann, 1936, p. 36).

Over time, many German industrial settlers changed their original place of settlement, looking for increased support and more favourable income-earning opportunities. Contributing to these immigrant movements was the competitive battle for textile professionals not only between the subregions of Central Poland (Kalisz and Mazovia provinces), but also through actions taken by the owners of private land estates and cities who tried to settle newcomers in their territories. In time, settlers coming from German lands gradually started to inhabit areas increasingly further east, but only a few decided to settle beyond the line of the Vistula.

Apart from the industrial settlements established in the 1820s, Central Poland was the location of numerous colonies established in government and private estates by migrating peasants. In many estates, there were at least a few such colonies and each of them was inhabited by anywhere from a few to a dozen German families. Significant concentrations of Germans inhabited the numerous agricultural colonies surrounding Łódź. A certain (but rather small) share of these colonies fuelled the fast-developing textile production centres by providing craftsmen for clothmaking. Incomplete data on the distribution of German agricultural colonists in Central Poland indicate that before the outbreak of the January Uprising, they were concentrated mainly in four districts: Łęczyca, Kalisz, Piotrków, and Rawa, where a total of about 28,000 agricultural settlers lived.

The influx of German people (approximately 90% of which were of the Augsburg Evangelical faith) to the lands of Central Poland over several decades at the turn of the 19th century was reflected (also from a spatial perspective) in the time of establishment and distribution of Lutheran parishes. Their number almost doubled during the first fifteen years of the existence of the Kingdom of Poland (1816–1830). A total of 11 new parishes were established, of which half were in the rapidly developing industrial district of Łódź (see Fig. 7)

German settlement in the Kingdom of Poland in the period before the Uprising (up to 1830), both agricultural and industrial and regardless of its character, demonstrated a clear tendency towards spatial concentration. The largest concentration of the German minority was in the district of Łódź, located closest to the Prussian border. Unlike in the Middle Ages (when migrant journeymen established workshops far away from their homelands), cases of migration of individual foreigners (without government support) to establish individual craftsmanship activity in cities and villages located in provincial areas were rare (see Wiech, 1999, p. 99).

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[36] Ginsbert reported that 1,029 immigrant families settled in Łódź from 1822 to 1831 (see Ginsbert, 1962, p. 17). According to Janczak, in 1830, 3,200 Germans were permanent resident of Łódź, which constituted 3/4 of the total population of the city (4,300 people) (see Janczak, 1982).

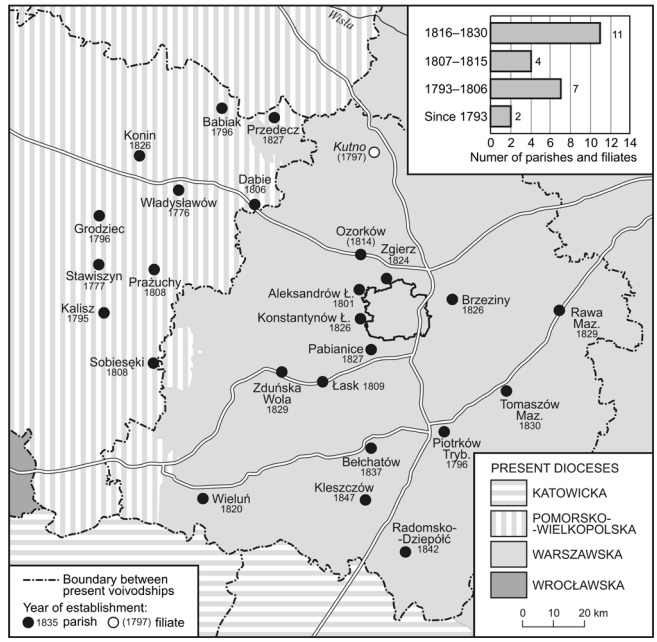

Fig. 7. Distribution of parishes and branches of the Augsburg Evangelical Church in Central Poland in 1830 (according to the date of establishment)

Source: own work based on Kneifel, 1971, pp. 292–295.

In 1827, the population of the German minority settled within the Kingdom of Poland totalled nearly 300,000. Just under 40% lived in two provinces of Central Poland, i.e., Mazovia, which included the Łódź district (70,500 people of German nationality), and Kalisz (45,100)[37].

In the decade prior to the Uprising, industrial settlers were definitely the dominating group among the newcomers. The influx of a professional workforce, almost entirely recruited from people of German origin, conditioned the development of clothmaking, and the main centres of textile production were also locations of a high concentration of German settlement. The spatial distribution of this ethnic group at the end of the 1820s was associated with the distribution of cloth production. In the scale of the entire Congress Kingdom, approx. 4/5 of this production was located in Central Poland, in the eastern part of the Mazovia province (close to 3/5 of the total number of wool spindles in the Kingdom of Poland were located here) and in the Kalisz voivodship (about 1/4 of the total number of woolen spindles in the Kingdom of Poland), and above all in the Mazovia-Kalisz textile district

[37] The number was determined on the basis of a linguistic criterion. See: Rodecki, 1830, Table 1.

(mainly the Łęczyca district), the most important centre of which at that time was Zgierz with its surrounding clothmaking settlements. In addition to Zgierz in the Łęczyca region, Ozorków, Aleksandrów, and Konstantynów held a key position in terms of textile production, followed by a slightly lower ranking Łódź. Apart from the Łęczyca region, the most significant clothmaking centres included Tomaszów Mazowiecki, Kalisz, Sieradz, and Opatówek. The period of the first heavy influx of German craftsmen to the Polish industry, which was most intense in the mid-1830s, ended with the outbreak of the November Uprising in 1831.

10. FINAL REMARKS

The rich body of literature devoted to the German minority in Poland offers an array of publications by both Polish and German researchers who provide a reliable description and possibly objective assessment of this ethnic group. However, this subject matter was often an issue of considerable controversy and differing interpretations of historical facts, while the formulated conclusions depended on who raised the topic and when, as well as the ideological position from which the matter was addressed. The realities of the functioning of the German minority in Poland were much more complex than the simple and generalised message we sometimes find in literature. The situation was quite different in various parts of the country, in different social groups, and in different periods.

The German population that came to Central Poland in the 19th century made an unquestionable, though difficult to measure, contribution to the development of the region and its main centre, Łódź, a city which over the course of several decades grew from a small neglected settlement to a key industrial centre. The settlers coming from abroad possessed traits very typical of Protestants – they were diligent and thrifty, and had a strong sense of responsibility and respect for work. Their willingness to invest at the expense of limiting current consumption facilitated their adaptation to a new place of residence and was of particular importance in the period of accelerated industrialisation (see: Kończyński, 1911, p. 60).

In the common perception, the German colonists constituted a homogeneous group, the main distinguishing feature of which was their language and faith. Yet in fact, the settlers from German lands were a very diverse social group. There were a number of reasons for this differentiation. The differences between the settlers came above all from their territorial origin – they migrated from Pomerania, the Poznań region, Saxony, Swabia, Silesia, and areas located on the lower Vistula (Niederunger). This in turn was associated with significant differences in the sphere of culture, differing customs, building techniques, and farming methods. The linguistic differences were significant, especially in the case of migrants from

the region of Württemberg and Baden (the Swabian dialect vastly differed from the German spoken by migrants from other regions). And most importantly, at the beginning of the 19th century, German settlers felt a stronger bond with the region they came from than with the German nation. The differences inherited from ancestors persisted for many years, while the processes of homogenisation within such a diverse German minority were often much weaker and slower than the process of Polonisation of future settler generations.

Differences in the realm of religion were no less important. Individual Lutheran congregations were diverse not only in terms of organisation but also in the liturgical sphere and all too often "An evangelical who attended a service in another, sometimes even neighbouring parish, felt like he was in a church of a different denomination."(Gastpary, 1977, p. 312). Some of the German settlers belonged to the Roman Catholic Church, while the group of Protestants included several smaller groups of Christians, in addition to the dominant Lutherans.

In the first and second generation of immigrants from German lands who came to Central Poland at the end of the 18th and at the beginning of the 19th century, the social integration process was still quite slow. The colonists and settlers living in the diaspora developed a certain pattern of existence, which focused on their immediate environment separating them from the outside world, while retaining their mother tongue and religious tradition was more an expression of traditionalist consciousness than national identity.

This did not change until the later decades of the 19th century, followed by World War I and the political events of the inter-war period; accompanied by gradual integration and assimilation processes, these events influenced social change which in turn redefined the ethnic identity of the German minority and its place in the community of their country of settlement.

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GOVERNANCE OF ECOSYSTEM SERVICES: A PLEA FOR A NEW PERSPECTIVE ON ECOSYSTEM SERVICES FOR LAND-USE PLANNERS

Abstract. Integrating the ecosystem services (ES) concept into land-use planning has been the focus of researchers in recent years. Forwarding this objective in order to foster human well-being, urban and regional planning became the focus of research efforts. Furthermore, governance research has been beneficial in studying the coupling of ecosystem services and planning processes. Thus, in this explorative case study we have analysed the governance of urban and regional planning in two case studies – Rostock and Munich – in order to gain insights about the role and value of ecosystem services among planning actors. We conducted semi-structured interviews to identify relevant parameters to facilitate integrational approaches of ecosystem services into decision-making in the context of cross-sectoral urban and regional planning. Based on our results, we argue for a change of the perspective of ES within planning practice. Instead of ecological or economic endeavours, the contribution of ES to human well-being should be in the centre of attention. Human well-being as an overarching aspiration may have the potential to shift ecosystem services from sectoral to cross-sectoral planning.

Key words: urban ecosystem services, land use planning, urban and regional planning, ecosystem service integration, science-policy interface

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1. INTRODUCTION

Cities not only have an impact on their environment but are also dependent on it. The relationship between the city and nature within urban space is increasingly being considered and discussed from the perspective of urban nature and green infrastructure for sustainable urban development. This often raises the question of the benefits of urban nature for planners in the context of changes to land use – which is why an examination of the concept of ecosystem services seems inevitable (Breuste, 2019, p. 100). Ecosystem services (ES) not only provide essential services, e.g., drinking water or food supply, but also contribute significantly to the quality of life in cities and to human well-being (Kowarik *et al.*, 2017; MEA, 2005). Particularly in view of global climate change, the integration of ES into urban and regional planning is increasingly becoming the focus of practice-oriented research (Geneletti *et al*., 2020b).

In recent years, the number of publications on the integration of ES explicitly aimed at supporting land-use planning decisions by trying to address real-world planning issues has increased (Longato *et al*., 2021). In addition to research on the recording and assessment of ES (Gómez-Baggethun and Barton, 2013; Burkhard *et al*., 2014; Förster *et al*., 2015; Kowarik *et al.*, 2017; Potschin-Young *et al*., 2018), concrete studies on the integration of ES in land-use planning have also been published (Mascarenhas *et al*., 2014; Kaczorowska *et al*., 2016; Terzi *et al.*, 2020), also considering legally binding land-use planning, for instance in Germany (Deppisch *et al*., 2021). Thus, the opportunities and barriers of ES integration in urban and regional planning have been studied and discussed (Luederitz *et al.*, 2015; Forkink, 2017; Longato *et al*., 2021).

Although there are recommendations for action on ES integration in strategic environmental assessments (SEAs) (e.g., UNEP, 2014), comprehensive implementation in land-use planning practice outside of research projects is still scarce, although planners are equipped with appropriate tools, such as permits, use options, and restrictions, to implement ES in making informed decisions (Geneletti *et al*., 2020a). However, Mascarenhas *et al*. (2014) have pointed out in their case study in Portugal that planners consider ES as already integrated in SEAs and in regional land-use plans. They have concluded that integration either exists implicitly in the planning documents or that there is a gap between planners' perception and the actual degree of integration (ibid.) But studies for Germany have shown that if just cross-cutting land-use planning is considered and not landscape-planning and further specific plans, many gaps of references to and preserving of and development of ES are lacking in current plans (Deppisch *et al*., 2022). Furthermore, a review of several case studies by Longato *et al.* (2021) shows that although there have been many efforts by ES researchers to develop universal classifications and tools to ensure broad applicability and comparability, a deep understanding of the local context is a prerequisite for providing effective planning support for ES integration. As Arkema (2006, p. 531) phrased it: "Site differences in management

goals, ecosystem function, and human use may affect the extent to which an ecosystem-based approach is incorporated into management planning."

In researching the integration of ES, a focus has also been placed on the (urban) governance of ES (Newig, 2011; Primmer and Furman, 2012; Wilkinson *et al*., 2013; Connolly *et al.*, 2014). As ES are beneficial for people and subsequently do not exist in the absence of people, they can be conceived as part of a social-ecological system. Sarkki (2017, p. 83) highlighted the complex links between ES, governance and human well-being, and promoted the "co-production of benefits for human well-being by ES and environmental governance". Thus, governance and its structure play an important role for the provision of ES. Farhad *et al*. (2015), for example, have shown how changes in governance and the interplay of local-level institutions and upper level regulation affect ES. The complexity and dimensional levels of ES (Grunewald and Bastian, 2018) favour the consideration of the governance of regional planning, as it requires the interplay of state, municipal, and private sector actors (Fürst, 2004).

Here, we focus on the general question of how urban and regional land-use planning in practice and its future results (of zoning) can better consider ES. We pay special attention to the governance aspects of planning in order to answer this question. In order to understand the motives and results of planning processes, a look at the governance of land-use planning has proven useful (Nuissl and Heinrichs, 2011). Land-use planning is characterised by complex collective action constellations with various actors involved, including a variety of modes of action coordination ranging from hierarchical to negotiation-oriented forms. The governance approach enables a holistic perspective on the forms of control and action of land-use planning in view of ES integration. The interweaving with actor-centred institutionalism as research heuristic enables feedback from chosen forms of interaction with the institutional context, as well as regional spatial-structural conditions (Wahrhusen, 2021).

In this explorative study we examine two single case studies – the region of Rostock and the region of Munich. Through the analysis of the governance related to ES in these two case studies we investigate the hypothesis that ES are deemed among planning actors as means for SEAs and not considered as an instrument for cross-sectoral planning. Subsequently, we elicit potential parameters that could foster the integration of the ES concept into urban and regional planning processes. First, we describe in the method section the research design of conducting semi-structured qualitative interviews with selected interviewees. This constitutes the empirical basis of our research. Second, we give a brief overview on actor-centred institutionalism (Mayntz and Scharpf, 1995), which we use as a research heuristic to draw insights from the obtained data and to provide explanations for further interactions to foster the integration of ES in planning processes. After outlining the context of the two case study areas, we present the main findings followed by a discussion of the results. We close the paper with concluding remarks and present future research incentives.

2. METHOD

2.1. Research heuristic: the actor-centred institutionalism

In order to draw insights about the interactions of different actors within an institutional setting and policy environment we examine our data in light of actor-centred institutionalism (ACI, German *Akteurzentrierter Institutionalismus*, Mayntz and Scharpf, 1995). It is rooted in the understanding of the processes and results of policy decisions (Treib, 2015). As part of the neo-institutionalism movement, actor-centred institutionalism should not be considered as a fully developed theory, rather as a research heuristic (ibid.). It relies on the assumption that the actions of actors are not ultimately controlled, yet influenced by the institutional framework (Diller, 2013). Actor-centred institutionalism at least offers support to classify the different forms of interactions that occur between different actors with specific capabilities, both cognitive and normative orientations within a given institutional context and under given conditions of a policy environment (Scharpf, 1997). Actor-centred institutionalism is too complex to incorporate its entirety systematically in an empiric investigation (Mayntz and Scharpf, 1995). However, the importance of political science research heuristics in planning science has been recognised and discussed (Diller, 2013; Krekeler and Zimmermann, 2014). Further, actor-centred institutionalism has been described as a conceptional bridge towards governance research (Gailing and Hamedinger, 2019) and also served as a research heuristic in the context of governance analysis about land-saving settlement development (Wahrhusen, 2021).

However, this qualitative research design can by no means extensively use the full scope of actor-centred institutionalism or provide definitive explanations of the cases. Thus, we emphasise the research heuristic properties of actor-centred institutionalism while addressing the qualitative data represented in this study. Our aim is to illustrate different institutional agendas and to indicate possible adjustments beneficial for ES integration which in turn address further areas of research. That is also why we have chosen two single case studies which inform the results and bear some differences in size – with Rostock as a relatively small regional centre and bigger city, and Munich as one of the biggest German cities and economic centres – as well as in terms of its geographical location.

2.2. The case study regions and their context

In our explorative case study design, the research focus was set to analysing the governance of urban and regional planning in the two single case studies – the region of Rostock and the region of Munich (Fig. 1). In choosing our case studies, we made sure to successively build access to the local knowledge, as well as contact

opportunities with relevant stakeholders. The choice of the Munich case study was apparent as part of the research team has been working for a long time with different projects in the fields of environmental planning, spatial development, and nature conservation in and around Munich. Therefore, a good knowledge base of the region and the planning context, as well as contacts to different actors were already in place. As a counterpart, we have chosen the Rostock case study as it geographically complements the Munich case study. Rostock is located in the north of Germany, while Munich is located in the south. Here, too, part of the research team had obtained a knowledge base of the region and the planning context, as well as contacts with stakeholder prior to the research. Both case studies are characterised by an urban core of economic importance within their respective German Federal States. In order to address the regional planning perspective in these regions we included one adjacent smaller town to both case studies – the city of Bad Doberan in the fringe of Rostock and the city of Dachau near Munich. By no means did we intend to directly compare the two case studies. The explorative approach of the underlying research project endorsed the selection of two geographically different regions and within those regions the focus on one bigger and one smaller city. By choosing our case studies we aimed to gain insights about the role and value of ES among planning actors and hoped to identify parameters relevant for facilitating integrational approaches of ES into decision-making in the context of cross-sectoral urban and regional planning.

Fig. 1. Location of the case studies in Germany

Source: own work based on map data from OpenStreetMap©.

2.3. Interviews

We conducted semi-structured qualitative interviews in each case study region with an average duration of one to one and a half hours. The questionnaire was developed in advance for both case studies and sent to the interviewees beforehand. It comprised different thematic blocks. These included the context of the case study region, the background of planning and decision-making processes with corresponding circumstances of governance practices of urban and regional planning, questions about relevant stakeholders and citizen participation, and questions about the ES concept, its evaluation, assessment and communication, and its ability to be integrated into the planning process. Depending on our interview partners, and their expertise and experience, we were able to delve into various thematic blocks and ask detailed questions about them. Yet other thematic blocks could only be addressed superficially depending the interviewees' knowledge. Our passages quoted further in this paper mark key passages that we would like to reflect representatively for a thematic block. The aim of the interviews was to gain a more comprehensive insight into different phases and aspects of planning using the expertise and practical knowledge of the interviewees.

A total of nine semi-structured qualitative interviews were conducted for the case study region of Munich. The interviewees included planning officials from departments for urban or regional development and planning bodies, local politicians, and civil society activists. Furthermore, six referred in their statements to Munich and three to the small adjacent town of Dachau.

For the case study region of Rostock ten interviewees participated, including planning officials from departments for urban or regional development and planning, representatives of the Chamber of Industry and Commerce, local politicians, and representatives of environmental agencies on the city, county and/or regional levels. Two interviewees referred to Bad Doberan, the smaller adjacent town near Rostock, five interviewees to the city of Rostock and 3 interviewees referred to the county of Rostock.

The participants of this study were asked to address the questions from their institutional role as experts and not as a private person. Thus, the interviewees in light of actor-centred institutionalism partly represent different institutions with diverse aims and resources, as well as partly different logics of action. While mainly – due to the matter of fact that urban and regional planning is an administrative act in Germany – administrative actors were involved, also the other logics of action were represented, such as politics, civil society, and economy. However, in accordance with data privacy regulations we cannot state the functions or positions of the individual interviewees as this would reveal their identities in such a small sample size.

3. GERMAN PLANNING SYSTEM

Land-use planning in Germany is to a certain extend hierarchically structured, and even though all levels set the frame for spatial and land-use development, regional and urban planning are the most relevant for considering ES and having a concrete impact on the ground in terms of the final land-use structure. While land-use planning at the regional or local levels has to weigh and then integrate all interests and demands on the land, there are also more specific plans and planning endeavours, dealing with specific land-uses or concerns, such as transport, landscape, energy or agriculture. In contrast to the local level, the regional level has to co-ordinate not only those specific demands, but also the interests and demands of the local communities of a region. That is why the regional plan is legally binding to the local communities in their land-use planning. On local levels, then, cities and communities develop in the ideal case a regulatory land-use plan for their territory as a whole and out of that the development plan, which is binding to everyone. How planning has to be performed and what has to be considered in doing so, is defined in two different explicit laws, which already tackle some ES explicitly, e.g., habitat.

4. RESULTS

The subsequently presented results represent key statements of interviewees to the thematic blocks posed by the interview guidelines. These address the research objective of eliciting the role and value of ES among planning actors of the case studies in two ways: (1) general responses representing the overall planning system (governance, i.e., involved and missing actors, goals, and assertiveness of actors), and (2) the position of ES among actors in the current planning system (i.e., allocation of responsibility). Following the results separated per the case studies, Table 1 gives an overview on the summarised main findings before these are discussed in the next chapter.

4.1. Rostock

In regards to the institutional setting, remarks about the priorities and goals of planning processes in the region can be drawn from the interviews. Without exception the goal of sustainable or balanced development was mentioned several times by the planning-related administration. This is also in accordance with German planning, as well as construction law claiming sustainable land-use

development as the overarching goal. In addition, less surprising and expectable goals were mentioned by interviewees, who mainly referred their own remit and were partly directly related to the target program or defined goals of their institution. For example, regional planning actors referenced the corresponding regional plan, environmental agencies referred environmental quality standards as the object of consideration and assessment standard for the Environmental Impact Assessment (EIA), and economic representatives emphasised economic stability and development. Furthermore, interviewees mentioned the focus of urban planning in the growing city of Rostock was on securing land for building, housing and community needs, however, in reference to balanced development between ecology and social issues. Yet, the focus in the smaller municipality of Bad Doberan was on tourism without harming nature too much, heavy rainfall events and flood protection besides creating affordable housing. However, aims were referenced regarding consistent environmental compatibility of all decisions. Interestingly, in addition to economic development, the simultaneous improvement of the human well-being among the population was highlighted as another important goal by economic representatives. In general, planning efforts reflected expected outcomes of a growing region, such as land-saving goals, securing housing, and maintaining economic attractiveness, especially in tourism-rich areas. However, all objectives were mentioned in connection with environmental concerns or as a compromise between social, economic, and ecological interests.

Furthermore, formal statements were made about the institutionally supported planning processes regarding the involvement of participating actors. In general, interviewee statements named the usually involved actors in regional planning and negotiation processes. Many of the actors mentioned are required by law (public authorities, specialist agencies, public interest groups, as well as the broad public) or also addressed in addition to include all interests on land, be it social, environmental or economic interests. One person said that the formal participation with "a long list of actors" also covered all actors:

> "Our list is so long. We deal with the actors who are really important. As it is in the daily routine, I'd say. And they are on our list anyway." (R1)[1]

Or as another interviewee has put it: "[a]ll those that are legally required, of course," (R2) are involved.

Missing actors regarding direct relevance for ES were not mentioned. Some individual statements about general missing actors in participatory processes, such as people with a migration background or those with low income, were made. However, the overall feedback about missing actors was that the usual procedure

[1] As the interviews were conducted in German, all quotes presented in this work were translated into English by the authors.

covered all relevant actors, like the statements about involved actors, or as one interviewee stated:

> "I can't think of any relevant actors off the top of my head, and I don't know whether someone we consider relevant has not brought them in." (R3)

In addition, the individual economic perspective, represented by local small and medium-sized enterprises (SMEs), was perceived as lacking, especially in the city of Rostock, although (regional) business associations or representatives were mentioned more often among the actors involved or at least addressed. It was also described that local companies only participated when concrete plans were already "on the table." It is also worth noting that late participation was generally mentioned as problematic, i.e., not a fundamental lack of certain actors, but their late participation. Further, as planning is also a formal procedure, in a late stage of the planning process an intense involvement of those actors and their specific interests could not be assured anymore.

The interviewees described actors who were basically involved in planning as assertive in principle, since they had already gained experience and could make more references to "abstract" topics (e.g., at the level of the land-use plan). In addition, it is advantageous if actors already have access to administrative structures. Thus, there were statements that described access at an individual level, e.g., through personal contacts (e.g., to the mayor) or political networks (e.g., parliamentary groups) – as one interviewee claimed:

> "These are the people who have a short line to the mayor, a short line to the parliamentary groups, who have networks of some kind, who do not even lower themselves to this level of participation from their point of view, but try to act without these processes." (R4)

However, assertive actors were also described at a collective level, for example, through associations that had already contributed or were contributing knowledge and experience to administrative structures (e.g., environmental associations). One statement from Bad Doberan, a region characterised by tourism and health resorts, described tourism associations and rehabilitation clinics with great assertiveness:

> "The tourism associations and such things are of course also important, because if we target the main tourism focus area, then of course the tourism service providers are a very, very decisive power." (R5)

It is interesting to note here that tourism associations and rehabilitation clinics have a great deal of influence on planning processes because they account for the majority of the economic viability in Bad Doberan. Apparently, there are differences at this level with the city of Rostock, where local SMEs were often

described as lacking actors. However, it is questionable whether the tourism association and the rehabilitation clinics in Bad Doberan can be described as local SMEs or whether they also act supra-regionally and thus have more power than classic local SMEs.

Alongside being described as assertive through bundling interests and engaging in political, administrative networks, environmental associations have further been described also as actors with allegedly most concern about ES. Besides being involved in planning processes for environmental issues, environmental associations were viewed as relevant actors for bringing the ES concept on the political agenda, as one interviewee stated:

> "Perhaps the local group of the [environmental association] in Bad Doberan is one of those who can perhaps get the topic more into politics here. That would not be such a bad thing in the sense of this process." (R5)

In addition, citizens, nature conservation agencies, and landscape planning entities, and, at the political level, the Green Party were also mentioned, although less frequently. Thus overall, the actors who were associated with dealing with ES in the context of planning processes by most interviewees can be summarised as environmental-oriented actors.

By contrast, the institutional environmental agency had only mentioned, in addition to specific environmental concerns, quality assurance as a priority, yet without directly referencing ES. Thus, in one known example, other actors have been instrumental in bringing environmental and open space concerns to the attention of the planning actors in Rostock. At the request of the public, the development model of the "Protection of significant environmental and open space concerns"[2] was included in the new version of the land-use plan, which, in addition to the preservation of all protected areas, also included the preservation of all allotment gardens (representing cultural ES among others) in Rostock (Hanse und Universitätsstadt Rostock, 2019). The fact that allotment gardens play an important role in future planning processes was also mentioned by some interviewees. Thus, even though environmental agencies are focused on environmental protection and the environmental interests are superficially included in the overarching goal of sustainable development of urban and regional planning (i.e., integrating social, economic, and environmental concerns), the public, with a strong interest in allotment gardens, managed to highlight green spaces as a major concern for future planning processes in Rostock. Perhaps this example suggests that currently ES or, in a broad sense, environmental concerns related to public interests are in the hands of the public (and politics) or at the fringe responsibility of environmental associations.

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[2] German: Entwicklungsmodell "Schutz maßgeblicher Umwelt- und Freiraumbelange"

Additionally, expertise and administrative responsibility were mentioned as factors of actors relevant for planning and the environment that force assertiveness. Public interest groups can affect planning outcomes by involving expert opinions and expertise on certain matters. Thus, for example as mentioned by interviewees, environmental authorities are in a position to enforce environmental concerns through expert reports during the planning process. Conversely, as has been generally stated by interviewees, competence determines assertiveness. However, if this is true, in real-world planning procedures it is debatable as otherwise ecological and environmental concerns would be much more prominent in every day planning and the public discussions about polluting and ecosystem harming construction projects in Germany would not take place.

Interview statements give insights into assertiveness and involved actors in the planning process within an institutional setting, and ascribe the potential responsibility of ES to environmental-oriented actors. However, direct responsibilities for the integration of ES cannot be made as responsibility is neither formally assigned nor distributed among planning actors, as one interviewee described:

> "That is a very fundamental question: Who bears the responsibility? Who records, who spends the money, who evaluates? And then there is also the question of how this flows into any procedures." (R1)

Overall, the planning process seems to consider all relevant stakeholders as far as interviewees reported. ES were mainly ascribed in the case study region of Rostock as part of the potential jurisdiction of environmental agencies or institutions. However, no direct responsibilities nor possible resources of entities as integrational tools were mentioned. Thus, it indicated, based on interview statements, a lack of current responsibility to integrate the concept of ES into the planning procedure as a measurement for improving human well-being, but a seeming allocation towards environmental agencies as potential jurisdiction. Nevertheless, factors that strengthen assertiveness can be derived from the interview statements. Associations around certain interests, e.g., environmental or business associations, connections to policy or planning networks, and overall actors with knowledge about administrative structures and the general planning process were mentioned as assertive factors.

4.2. Munich

In regards to the institutional setting, remarks about the priorities and goals of planning processes in the region can be drawn from the interviews. Overarching priority issues in the case study region of Munich were the high growth pressure in the region, which could be seen in the rising population figures, the high influx into the region, and the associated challenges with regards to the design of

the infrastructure. Above all, this includes saving land in the region. Issues surrounding traffic and mobility play an important role, too: Dachau was described by the interviewees as a mobility hub, which is why a traffic turnaround was urgently needed. Munich also featured increasing traffic congestion as an important issue; a better design of local public transport and the expansion of public infrastructure seemed to be necessary. It is interesting to note here that the interviewees from Munich indicated that the issue of transport had fallen on the defensive due to the dominant housing problem. Important environmental issues in the case study region of Munich were ostensibly related to the conflict between the protection of natural areas and the needs of people seeking recreation. Protection was also mentioned by the interviewees as an important environmental concern. This referred to, for example, the protection of species and biotopes, groundwater protection, noise protection, nature conservation, and the preservation of fresh air corridors. The interviewees from Dachau emphasised the role of the "Dachauer Moos" (a *fen landscape north of Munich*), which is a typical regional landscape feature that has been severely lost in some parts. Biodiversity and ecological connectivity were also mentioned as important environmental concerns for the region. However, in all the statements, there were hardly any direct references to ES.

Here, too, it is noticeable that the interviewees named goals related primarily to their own area of responsibility and, in some cases, were directly related to the target program or the defined goals of their institution. For example, representatives of regional planning entities have referred to the concerns that affect the region, such as the topics of settlement, free space, and traffic. Representatives of the urban planning generally referred to the negotiation processes between different, sometimes contradictory, concerns that were typical of a large city like Munich. Local politicians referred in their statements to their membership to their parliamentary parties. The reference to the corresponding institutions of the interviewees became clearest when they were asked about the actors involved in the planning and decision-making processes or who were not involved or not sufficiently involved. Here, hardly any information regarding the participation of different actors could be gained from the interview material for the case study region of Munich. Some results, though, were obtained regarding possible governance structures, which are presented subsequently.

Overall, the answers given by the interviewees regarding possible governance structures hardly enabled us to draw any conclusions about governance constellations or informal coordination possibilities. On the one hand, this was due to the sensitive nature of the question and, on the other, to the tendency of the interviewees to refer to existing formal guidelines of their institutions when answering such questions. Nonetheless, it was possible to obtain some statements in this regard. From the interview material of the case study region of Munich, we were able to identify various factors that, according to the interviewees, strengthen one's own

assertiveness. These include one's own network and (personal) relationships with relevant actors, direct contact with decision-makers, and the opportunity to participate in various committees or networks.

> "But it happens, yes, people pick out our phone number and, yes [laughs], you can say, then harass us in the office. Yes. It happens." (M1)

The interviewees mentioned that these factors enabled them, on the one hand, to ask for and disseminate informal opinions at an informal level. On the other, to exert influence at the informal level had a favourable effect on the acceptance of the topics that one wanted to set. Another aspect that was mentioned by the interviewees was the timing of the participation or action of the actors. The interviewees emphasised that it was only possible to set one's own agenda if there was early participation in the decision-making process possible, meaning before the issues had been decided. At a later stage, the interviewees emphasised, it was basically no longer possible to change the existing agenda[3].

> "And accordingly, we have the opportunity to suggest certain points as early as possible, already on an informal level, to point out conflicts and needs from the point of view of the environment. If this is not possible, then only in later procedures with the problem that then often some things are simply already set, which are difficult to turn around again." (M2)

Therefore, it can be concluded from the interviews that early participation and early influence in relevant processes can be seen as a prerequisite for one's own assertiveness. The interviewees also made statements about their procedures, which could have had a favourable effect on their own assertiveness. For example, regular coordination was the foundation of one's own approach. The importance of exchange and interaction in all directions was also emphasised, as was a results-oriented approach and, somewhat related, an efficient and pragmatic choice of topics. The way of arguing could also have a beneficial effect on one's ability to assert oneself. Becoming part of the agenda, emphasised by an interviewee from Dachau, worked via monetisation or the reference to economic figures. Another interviewee indicated that it could be helpful to broaden the range of concerns in an argument. Finally, binding requirements such as laws were mentioned, which could be seen as an enhancer of one's own assertiveness and thus binding formal requirements facilitate cooperation because they leave little or no room for interpretation.

> "And that, of course, is also an enrichment, that one can stand up and say, dear people, that's the way it is, we can't go over it in the consideration, but that has to be complied with." (M2)

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[3] Similar statements can also be retrieved in the statements regarding the integration capability of the ES concept.

In addition to the factors that strengthen one's own assertiveness, we asked our interviewees also about assertive actors, and the reasons for it. The following answers were obtained and compiled from the interview material. The interviewees emphasised that actors with common interests who organise themselves were considered to be assertive. As examples they mentioned clubs, associations or sponsors that organised or established for themselves.

> "It's probably easier for the [actors] who have the best personal contact with the individual city councilor. Or probably also for those actors whose overlap of members of the party or faction is greatest with the conviction they represent. I'll say now, for example, the influence of [environmental association] is greater in the Green faction than in the [conservative] faction." (Int: M3)

In this context, environmental and nature conservation associations were frequently mentioned. Furthermore, actors with a strong lobby and thus strong possibilities to influence decision-makers were rated as assertive. Environmental associations were also mentioned. Additionally, ES were often related to environmental concerns and thus ascribed to these environmental-oriented actors, as one interviewee phrased:

> "The 'real advocates' of nature, species and climate protection concerns are of course the nature conservation associations." (M4)

Finally, actors who – from their institutional position – had decision-making power were characterised as assertive. As examples, the interviewees listed political decision-makers, such as mayors, city councils or city politicians. In this context, and less surprisingly, those actors who had the best individual contact with their individual city councillor or who had the greatest overlap in terms of content in their topics were also defined as assertive.

> "I have a direct line to the mayors and the relevant administrations. All it takes is one phone call, and I'm basically there. Of course, the larger the municipality, the more difficult it is." (M4)

From the interview material, it was also possible to identify possible multipliers that had a beneficial effect on one's own assertiveness. The interviewees named the professionalism, personal appearance, and the personal knowledge of those involved as relevant factors that had a reinforcing effect on their own assertiveness. Furthermore, actors who had a good political connection to the relevant decision-makers were defined as being assertive. In addition to these points that can be specifically assigned to actors, two aspects were also mentioned that were related to the actors' working methods. First, a practiced approach of actor groups was classified as a reinforcing factor. For example, the urban planning of Dachau has been mentioned, which, according to the interviews, is characterised by its good, practiced way of working. At the same time, it was named as a reinforcing

factor if the concerns of actors could be made visible in public space, for example with the help of citizen initiatives or citizen participation.

Table 1. Overview on the summarised results of both case studies

	Case study: Region of Rostock	**Case study: Region of Munich**
Priorities and goals related to the planning results	Majority: sustainable and balanced development; compromising social, economic and environmental interests Single sector-related goals, economic goals linked to improvement of human well-being depending on state of environment Urban planning securing land for building, (affordable) housing and community needs Small town specifics: flood protection, tourism development without excessive harm to nature	Overarching priority issues: growth pressure in the region, high influx, land scarcity, housing shortage, ecological connectivity, conversation of biodiversity General issues: conflicts over commercial land, residential land and green space; conflicts between protection of natural areas and the need for recreation Small town specifics: independence of the city of Dachau as an urban body in the dynamics of the Munich metropolitan region, question of how an urban body can be maintained and how it can be preserved from urban sprawl
Involved actors	Long list of actors as legally required	Long list of actors as legally required
Missing actors	Low income and migration households Small and medium-sized enterprises Late involvement of some actors as a problem	Late involvement of some actors as a problem Stakeholders or persons who do not have a lobby or are not visible in the public sphere or in the public discourse
Assertive actors with regards to the influence on the planning results	Stakeholders who are already very familiar with the planning process Persons with strong personal contacts in local politics Associations (e.g. tourism environmental) Strong economic actors, especially in small towns Competence and expertise: administration such as environmental administration through bringing highlighted external expertise in the process	Stakeholders who are already very familiar with the planning process and know each other personally Persons with strong personal contacts in local politics, especially those who have decision-making authority, or in planning processes Associations (e.g. environmental) Competence and expertise: administration such as environmental administration through bringing highlighted external expertise in the process

Table 1 (cont.)

	Case study: Region of Rostock	Case study: Region of Munich
Actual current responsibilities for ES	No clearly attributed responsibilities to ES: dispersed among different sectoral administrations that have ES not explicitly as their responsibility (as, e.g., environmental administration) Local public/citizens bringing urban green spaces (allotment gardens) strongly in the planning process	No clearly attributed responsibilities to ES: dispersed among different sectoral administrations that have ES not explicitly as their responsibilities
Attributed responsibilities of actors for ES in the (near) future	Environmental associations Nature-related administrations, especially landscape Planning and nature protection Green Party	Environmental associations Nature-related administrations Planning and nature protection

Source: own work.

5. DISCUSSION

Before we start discussing the results, we shall reflect upon the study design, as well as on limitations in performing the interviews. The unique research design of including a large city and an adjacent smaller city in two different case studies is beneficial for this abductive research approach. However, this also holds caveats. For example, the interview enquiry returned in the larger cities more interview partners than in the smaller ones because in the larger cities potentially more interview partners were available. Further, larger cities often exert powers financially (and culturally), dominating and highly influencing developments in their nearby regions. Thus, interviews might overrepresent perspectives dominated by the development processes in larger cities. Additionally, the conducting of the interviews was affected by the outbreak of the Covid-19 pandemic, and thus no fieldtrips or face-to-face interviews nor direct participation in planning discussions were possible. For further research proposals, ethnographic and participatory methods could supplement the data. We discuss the results along the two identified main subtopics: (a) responsibilities towards ES in the land-use planning system, and (b) governing human well-being through governing ES.

5.1. Responsibility for cross-sectoral ES in a sectoral planning system

The interviews raise questions about the responsibility for ES within the planning procedure and gave insights regarding properties that could contribute to improving the assertiveness of the involved actors. In general, over both case study regions, the planning process was described as including every relevant actor, so that no missing actors relevant for ES integration were apparent. However, explicitly mentioned among the interviews in Rostock, none of the actor institutions have been accounted as being responsible for the integration of ES yet mostly the responsibility for ES was ascribed by interviewees towards environmental-oriented actors, i.e., environmental or nature conservation administration or respective associations. This represents an approach to integrating ES into the planning practice. For example, Heiland *et al*. (2016) and Grunewald and Bastian (2018) have described the relevance of ES for nature conservation and, therefore, referred to landscape planning, representing specialist planning relevant to nature conservation in Germany, as the adequate instrument to integrate the matter of ES into the general land-use planning process. However, landscape planning has its limitations covering explicitly all potential ES, such as many provisioning services, as well as some regulating services. The integration of a broad spectrum of different ES would, if we look at the planning system in Germany at least, have to be dispersed to the responsibility of different specific planning endeavours and administrative units (also at different levels). Or perhaps certain ES are not even covered by any administrative units. It is within the process of general land-use planning to cut across all those different sectors and specified interests on land and land-use and to bring them together and weight those interests in order to arrive at a cross-sectoral common land-use decision in the final plan (Scholles, 2008, p. 309ff.). Thus, even though environmental concerns might be integrated into the planning process through the landscape plan, these concerns might not pass this weighing decision of general cross-sectoral land-use planning which has to weigh those environmental concerns against all the other interests on land-use – in growing cities those are, among others, predominantly housing, economic, and related transport concerns.

The overall qualities of ES are the contributions to human well-being; though the concept of ES promotes general environmental concerns, these interests cannot solely cover the whole scope of ES. Especially in urban areas where land is scarce, ES must be integrated exceeding arguments only about environmental concerns. Thus, to unfold the full potential of ES in urban and regional planning, integration of ES should be addressed towards human well-being. This could shift ES from a nature conservation perspective to a cross-sectoral human well-being perspective and thus responsibility shifts from landscape planning towards city regional planning. Thorén and Stålhammar (2018) explored the ES concept in a comparison to economic dominance highlighting the early attempts to integrate

ES into decision-making through strict economic terms. Even though the (scientific) development of ES has broadened since then, including multiple values, they questioned the magnitude of the changes of perspective: "However, it is unclear to what extent this apparent shift involves a substantive change in perspective and a departure from a conventional economics framework, and the challenges associated with such a framework" (Thorén and Stålhammar, 2018, p. 2). Residue economic values were also mentioned in Munich to the extent that monetarisation would apparently strengthen the ES concept in planning processes.

In order to bridge sectoral and administrative borders among different planning interests and authorities to implement ES, some scholars have proposed to create or facilitate organisations or actors who can act and navigate across sectors and scales (Droste *et al*., 2017; Andersson *et al.*, 2014; Ernstson *et al*., 2010). Interviewees did not directly mention *scale-crossing brokers* (Ernstson *et al.*, 2010), yet the importance of networks and contacts was mentioned. Thus, the establishing *brokers* in the case study regions might prove beneficial for integrating ES into the existing planning system. However, this would not only bear costs (in terms of personnel and facilities) but would also interfere with, as subsequently highlighted, a rigid planning system where an overall notion of "no actors are missing" prevails. Also, especially for regional planning, financial means are already not in all regions broadly distributed in Germany (depending on the federal state which organises the regions and respectively the regional planning finances). It is difficult to imagine how those brokers could be financed at all.

Derived from the interviews, the planning system can be understood as a fundamental, strict, all-encompassing, and trusting institutional system. Understandably, the actors pursue the institutionally established goals and use the institutionally established processes that are perceived as comprehensive. This is reflected in the statements that all relevant stakeholders are also involved in the planning process through legally binding instruments. However, it is also clear that the institutional goals are very specific (i.e. reconciling residential and commercial attractiveness with land saving goals in a growing region) and that there are no stakeholders who specifically pursue ES as a holistic concept. The overarching prescription of sustainable spatial development (i.e. combining social, environmental, and economic concerns) is also evident in the interviews, but again very specific: environmental actors are responsible for environmental concerns, and economic actors for economic ones. A holistic view of the task of sustainable land-use planning under the uniform goal of preserving and improving the quality of life for people, as is attempted to be communicated with the ES concept, is not yet incorporated into the specifically oriented planning structure, at least in the two case studies presented here. It seems that the institutional structures of the planning process cannot yet encompass holistic approaches such as ES. Integration at this point must happen through individual actors who are aware of the importance of the functioning of ecosystems on human well-being, as Longato *et al.* (2021, p. 82) stated in their

literature review: "In most of the analysed case studies, ES integration occurred because of the commitment of policy-makers and stakeholders and their high awareness of ES importance. This need for a 'fertile ground' suggests limitations to the conceptual use of ES as the entry point to promote environmental awareness and pro-environmental attitudes, at least within spatial planning processes". Thus, it is necessary to develop approaches to integrate ES into the planning process beyond the commitment of single pro-environmental individuals.

As planning only prepares, though intensively, the final political decisions on future land-use, it cannot be land-use planning alone that establishes ES as a common argumentative basis for decision-making. Moreover, the ES concept also has to be promoted within politics and society more intensively to raise further awareness and to potentially set weighing differently in the planning process, as well as in the final land-use decisions. The fact that the political will, and the underlying societal will, are important prerequisites for integrating ES into the planning process was also a strong point made by different interviewees, and that also reflected opinions from the literature (Grêt-Regamey *et al.*, 2017; Runhaar *et al.*, 2009).

5.2. Governing human well-being through ES

Dealing with the complex and often unknown interrelations within social-ecological systems and the multiple values addressed at ES and the multiple actors benefiting and contributing to ES demands a multi-level governance approach with an effective science-policy interface and participatory and adaptive processes (Newig, 2011; Loft *et al*., 2015; Mann *et al*., 2015; Spyra *et al*., 2020). Furthermore, we argue that an institutional change of perspective (as described above) is needed to lay the foundations for adaptive and integrative governance for ES in cross-sectoral urban and regional planning. ES must be discussed as benefitting human well-being in a holistic approach, thus exceeding the apparent view (as expressed in the interviews) in the planning practice as environmental concern in need of economic valuation – setting an argumentative baseline in weighing decisions for ES as a foremost contribution to sustainable human well-being furthering ES integration into the planning process.

However, the caveat of this explorative study is that we could not empirically test the change of perspective, neither develop tools in order to facilitate this change. Nonetheless, through close engagement of the research project with planning practitioners we hope to have influenced and stimulated a change of perspective that might induce a transformative pathway from actor to institution. Often an iterative science-policy process or science-policy interface has been mentioned in the literature to foster and promote ES uptake into planning and decision-making (Görg *et al*., 2016; Kettunen *et al*., 2017; Ruckelshaus *et al*., 2015; Loft *et al*., 2015). Further, properties of assertiveness within the planning process were

mentioned by interviewees, which might help develop future strategies to successfully integrate ES in the local planning system through engaging in the governance of ES (Table 1). Additionally, Farhad *et al.* (2015, p. 100) has emphasised "the strategic importance of local-level institutions" for the transformation of governance systems for the successful management of ES, yet acknowledging that top-down structures complement the process. All these notions could potentially affect pathways towards integrating ES into the planning system (Fig. 1).

The complex links between human well-being and the social-ecological system of ES and governance have been emphasised by Sarkki (2017, p. 83) by promoting the "co-production of benefits for human well-being by ES and environmental governance." However, how far human well-being is prioritised currently in the planning system and not equated with economic stability remains debatable. Nevertheless, in view of the striking effects of climate change and the need for resilient cities safeguarding human well-being for future events becomes indispensable.

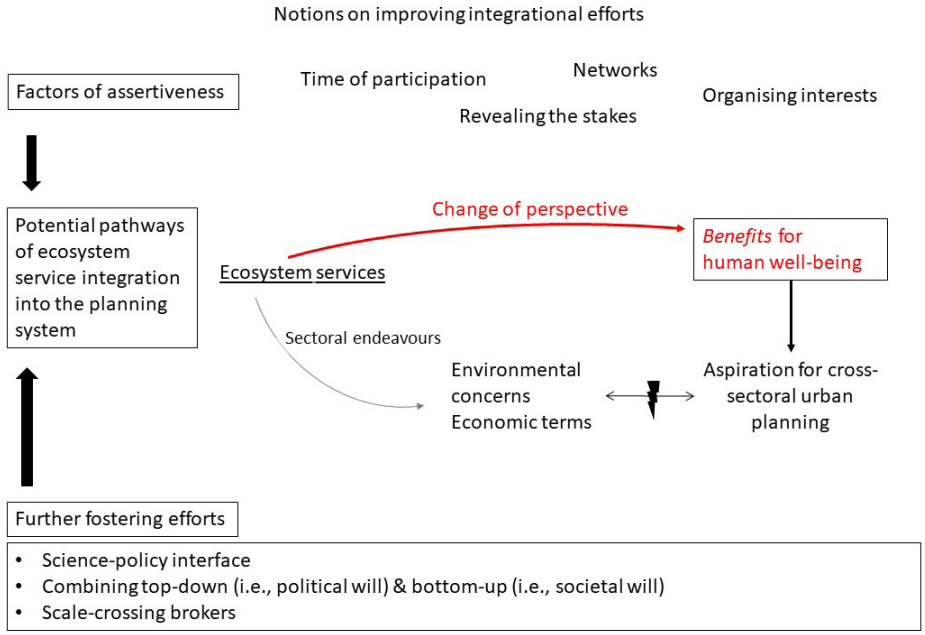

Fig. 2. Overall representation of efforts that could potentially foster the integration of ecosystem services (ES) into urban and regional planning. Focus of this research relates to the integration pathway (red arrow) where the benefits for human well-being are perceived as the most relevant factors for integration as they stimulate cross-sectoral planning efforts. The more conventional pathway (grey arrow) is to include ES as means for environmental concerns (i.e, nature conservation) or with economic terms (i.e., monetarisation)

Source: own work.

Table 2. Factors of assertiveness derived from the interviews with further explanations

Factors	Example	Explanation
Time of participation	"And accordingly, we have the opportunity to suggest certain points as early as possible, already on an informal level, to point out conflicts and needs from the point of view of the environment. If this is not possible, then only in later procedures with the problem that then often some things are simply already set, which are difficult to turn around again." (M2)	Early involvement and raising of the relevant topic seems to be beneficial for successful integration into the planning process with later consideration of implementation.
Network	"These are the people who have a short line to the mayor, a short line to the parliamentary groups, who have networks of some kind, who do not even lower themselves to this level of participation from their point of view, but try to act without these processes." (R4)	Close connections to decision-makers or planning actors and creating a network of planning-related relationships fosters recognition of certain issues or ideas.
Revealing the stakes	"And that, of course, is also an enrichment, that one can stand up and say, dear people, that's the way it is, we can't go over it in the consideration, but that has to be complied with." (M2)	This can relate to a top-down approach where, for example, certain laws or policies require certain actions. However, this can also relate to bottom-up approaches where society pressures certain issues on the political agenda. Further, at an individual level, involvement and ownership might be created through small, local projects (i.e., examples of best practice) or consternation towards the broader public is expanded through campaigning.
Organizing interest	"Perhaps the local group of the [environmental association] in Bad Doberan is one of those who can perhaps get the topic more into politics here. That would not be such a bad thing in the sense of this process." (R5)	Individual matters are difficult to include in an overall planning matter. Thus, an organisation of individuals advocating for specific interests, e.g., in associations, exercises more pressure on the political and planning system.

Source: own work.

6. CONCLUSION

Ecosystem services in urban and regional planning have influenced and fostered practice-oriented scientific discourses in recent years thus resulting in insights about the assessment and valuation of ES, as well as the opportunities and barriers of ES integration. However, practical implementation in real-world cross-sectoral planning systems has yet remained scarce – especially in Germany. Therefore, this research focuses on the role and value of ES among planning actors in two case studies in Germany in a desire to identify relevant parameters to facilitate integrational approaches. This explorative research has revealed a disciplinary and all-encompassing planning system in which the issue of ES integration is mostly relatable to the remit of environmental oriented actors (i.e., environmental administration or associations), yet without clearly attributing responsibilities. Thus, the sectoral structure of the planning system professes no allocation, let alone responsibility for ES except as a potential adjunct to environmental concerns, fostering and reinforcing a selective perspective on ES as environmental or economic means. However, factors of assertiveness can be drawn from the interview statements, e.g., early involvement of actors about a certain issue in the planning process is beneficial for success or maintaining networks with close relationships to decision-makers and planners (Table 2). In addition to other scientifically discussed approaches like science-policy interfaces and the combination of top-down and bottom-up incentives, these factors could contribute to a more intense and all-encompassing uptake of ES into the planning systems (Fig. 2). However, in order to unfold the full potential of ES, we argue for a change of the perspective on the objective of integrating ES within the planning practice – away from the sectoral perspective of ES as an environmental concern or economic benefit. The fact of addressing ES as an important means towards improving human well-being potentially shifts the ES concept from a sectorally perceived and attributed endeavour, i.e., environment-related, to an integrative cross-sectoral land-use planning endeavour.

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REVIEW ARTICLES

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BASIC MODELS OF PROTECTION AND FUNCTIONING OF THE UKRAINIAN BORDER IN MODERN GEOPOLITICAL REALITIES: A VIEW FROM UKRAINE

Abstract. In the article, the authors summarised the concept of state border security. They have suggested a wider interpretation of the border security model. They discussed modern models of border security in a theoretical context. They presented progressive models of security and functioning of Ukraine's borders and described their features. They emphasised that the modern Ukrainian-Polish boundary represents a partially liberal model of security and functioning and it can be characterised by the operational security model. Different models of the functioning of the Ukrainian-Polish boundary (asymmetrical, selectively simplified, and symmetrical) were identified and connected with the transformational processes of the Ukrainian-Polish relations.

Key words: state border, Ukraine, Poland, EU, Russia, Belarus, Moldova, border protection, border functioning, model.

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1. INTRODUCTION

In today's world, much attention is paid to security issues, in particular the security of state borders. The migration crisis on the Belarusian-Polish border in 2021, the accumulation of troops on the Belarusian-Ukrainian border, and the Russian-Ukrainian war since 2014 with its large-scale aggression since 24 February 2022 are examples of threats to EU security and to its borders. The protection of state borders, and the introduction of new models and methods of its functioning are currently at the main focus of states' leaderships, international organisations, and state institutions for border protection. Researchers are also investigating these issues intensively.

In general, a "model" is a physical, symbolic, or imaginary system. It imitates, reproduces, and reflects certain principles of the internal organisation and functioning, some qualities, certain features, and/or characteristics of an object that is studied (original). A classic model is defined as a "phenomenon, object, paradigm, or hypothetical image." We consider that, in the current case, the model of state border security should be studied as a system that displays the processes of state border protection. Nowadays, the model of state border security is a common notion that is widely used in official documents, scholarly papers, journalistic works, and the mass media. One of the most common definitions of the notion of a border security model is an alternative to the concept of a "system of state border security", which implies regularities in the supposed actions of regular, additional, interacting forces and means in contrast to the probable actions of violators of the legislation on a state's border. There are several models of state border protection in the world today, which we shall discuss in this article. However, the changing geopolitical situation, the emergence of new challenges and threats, such as war with the large-scale Russian invasion of Ukraine, the emergence of refugees from Ukraine in Poland and other EU countries, and the global migration crisis are forcing all states, including the EU, to search for new effective models of border protection and security mechanisms. Much attention is paid to these security issues both in literature and in practice, i.e., in border management. However, theoretical and applied aspects of the concept of border security and functioning models in general, and in particular of neighbouring states, should be studied more deeply, especially for the development of integrated models. Complex models of the functioning and protection of Ukraine's borders at its various border areas (including with the EU), as well as models of border protection with their predominant measures and models of functioning, are studied in this article. The article also proposes a new "crisis" model of protection and functioning of Ukraine's border with EU Member States, in particular with Poland, which has arisen in response to Russia's aggression against Ukraine. Therefore, the investigation proposed in the article makes a significant contribution to the study of security issues of state border protection, and it becomes important for the practice of their protection and functioning, especially in the changing geopolitical situation in Europe.

2. THEORETICAL FRAMEWORK

In the modern world, much attention is paid to the study of borders, in particular the security of state borders. Nowadays, research and scientific investigation also greatly contribute to a better understanding of this issue. However, scholars tend to investigate the borders of their own countries from their country's side. In assessing the experience of protection and functioning of Ukrainian state borders, in the article was important to use mainly works of Ukrainian specialists, as well as Polish scientists and practitioners who have had significant experience in border protection. This choice of literature was also influenced by the fact that Poland is Ukraine's closest neighbour and has become a powerful defender of Ukrainian state's independence during the Russian-Ukrainian war.

At various points in time, Ukrainian and Polish academics were interested in the security of the Ukrainian-Polish border. It is clearly visible in numerous publications, including works by such Polish researchers as L. Bednarek (1998), P. Cichoracki (2012), H. Dominiczak (1992; 1997), P. Eberhardt (1994), W. Śleszyński (2007), and others. In their work, the scholars explained the formation of borders, examined the security of the Ukrainian-Polish border within different time frames and under different political regimes, and analysed the activities of the border security state institutions and examined their effectiveness. The origins of border formations in Poland related to border protection were studied in the works of L. Bednarek (1998). His works have also revealed factors that have led to the establishment of such border institutions. W. Śleszyński (2007), a Polish researcher, examined the activities of border formations in the context of the functioning of the Polish security apparatus during the interwar period (1921–1939). H. Dominiczak (1992, 1997) and P. Cichoracki (2012) conducted research on the causes and factors influencing the formation of state institutions for border protection. Moreover, the formation and change of the most effective border protection structure, i.e., the Border Guard Corps, are among the important topics that have been often studied by modern Polish researchers, such as L. Bednarek (1998), H. Dominiczak (1992, 1997), and M. Cieplewicz (1995). M. Cieplewicz could be called the historian of the Polish Army. In his works, M. Cieplewicz examined the origins, organisation, and the tasks of the Border Guard Corps as a military structure. The specifics of foreign policy of Poland and its security were studied in the work of A. Bieńczyk-Missala (2016). It was necessary to study this work to understand the way Polish borders function in order to fulfil this task. The current changing role of borders especially in Central and Eastern Europe was studied in works of such authors as V. Kolosov, M. Więckowski, (2018) and J. Zupančič, J. A. Wendt, A. Ilieş (2018).

Modern Ukrainian scholars like L. V Bortnyk. (2015) and O. V. Razyhraiev (2012) studied the creation and functioning of such Polish border protection institutions as the State Police and the Border Guard Corps. O. V. Altunin (2005),

N. Antoniuk and N. Papish (2019), M. Barthel (2021), L. Bortnyk (2015), Z. Buchko (2020), O. Holdun (2009), R. Kotsan (2012; 2019), N. Krasnikova, H. Filatov and D. Krasnikov (2016), and K. Wolczuk (2008) are among other modern researchers who have devoted their works to the formation of the Ukrainian border in general, and in particular the Ukrainian-Polish border at different historical times, the study of the political peculiarities of its formation, and the legal and institutional aspects of protection and functioning. These authors analysed the formation of Ukraine's borders in the past, they have drawn attention to the security of the modern border, revealed the border problems between Ukraine and Poland, and emphasised the need to reform the state border protection system in Ukraine.

Nowadays, the issue of protecting the various sections of Ukraine's state borders is acute. The introduction of a new model of state border protection is currently being actively studied by O. V. Altunin (2005), R. I. Kotsan (2012, 2021), M. M. Lytvyn (2010, 2012), and V. O. Nazarenko and A. V. Vikhtiuk (2011). Their works are devoted to the study of the Border Troops of Ukraine, the modelling of the processes of state border protection, the introduction of integrated border management, and improving the level of national security in Ukraine.

Legal aspects of Ukraine's state border functioning were analysed in the works of K. Wolczuk (2008). The questions about the formation of Ukraine's border in general, and its Ukrainian-Polish part in particular, in different time periods, the political peculiarities of its formation, and the legal and institutional aspects of protection and functioning were studied in works by such scholars as N. I. Papish (2013), O. V. Razyhraiev (2012), etc.

Yet further research is needed on the synthesis of security and functioning of state borders (particularly its Ukrainian-Polish component), as well as the distinction of security and functioning models of borders between neighbouring states. These issues are especially important and relevant at the present stage because there are no studies on this topic available in free access for foreign scientists and researchers, a fact that had led us to choose the research topic proposed in the article.

3. DATA AND METHODS

While studying the formation of state borders and the features of their functioning, it is important to use knowledge from the field of limology, which analyses theoretical approaches to the study of borders. V. A. Kolosov (2003, 2008) has identified several theoretical approaches and divided them into traditional and modern. In the modern methodology, a relatively new approach to the study of the processes of formation and development of various structures is a synergetic

approach. The scope of its study includes nonlinear effects of the evolution of systems of any type, which involve multiple scenarios of further development. In explaining political processes domestic and foreign scholars actively use a synergetic approach because it reveals a probable vision of the world, as well as possible scenarios for the development of systems under the influence of various factors and their combinations (Maksymova, 2009).

In the case of the study of the development and transformation of state borders, the synergetic approach enables one to see the instability or imbalance of the system (i.e., the state border), which can occur in some spatio-temporal characteristics under the influence of foreign and domestic policy changes. While conducting state border investigations, applying a synergetic approach makes it possible to understand the orientation of the study object and to achieve a political, economic and social balance between the components that characterise the state border as a holistic system. Synergetics holds the key to understanding the little-known causes of addiction. It reveals the mechanisms of instability, as well as the stability of systems, including those at the state border.

Synergetics is somewhat similar to dialectics, but there is a fundamental methodological difference between these paradigms. Synergetics explores the dynamics and the movement of the process, and dialectics is a political phenomenon in the unity and struggle of opposites, in constant renewal and development. The aim of the dialectic approach was to identify the content of the functional component of the border, and the contradictions of domestic and foreign policy development of two states.

The systems approach is the logical tool, covering all the above approaches. It allows us to consider the state border as a holistic, dynamic system. It also makes it possible to reveal the "mechanisms" that ensure this integrity (purpose, "input", elements, functions, connections, and "output") (Bebyk, 2000; Shlyakhtun, 2005). The systems approach is important in dialectical cognition (Punchenko, 2014). It helped to gain a deeper understanding of the essence of the state border, to fully reveal its problematic issues, and to understand the range of its activities. The characterization of the state border as a system, which means a set of elements, rather than their simple sum is of great methodological importance. Awareness of the relationships in the systems and the interdependence of the elements helped to understand the trends of the political process, and the formation and functioning of borders, its dynamism, development and transformation.

The use of specific research methods, as well as the use of various details and their analysis is required for a successful study of state borders, the political interaction of interstate actors, the development of border protection models, and their operation. In this study, the methods of structural and functional analysis were used, which helped to understand historical, political, economic, cultural, and other phenomena in terms of the dynamics, changes, and functions of state borders (Shabliy, 2015). The comparative method was also used in this research. It was based on the principles of the similarity and difference between comparative objects. The use of

a comparative method in the study of different models of state border protection and functioning helped to compare security measures and features of functioning in view of current challenges of domestic and international nature.

The modelling method was also used while conducting the research. The article considers the model of state border protection as a system that reproduces the processes of state border protection. The method is used to build models of state border protection in modern Ukraine. It is based on the principles of border policy and aimed at maintaining the appropriate level of border security, it is provided by integrated border management, and implemented through the functions of the border institution (Altunin, 2005). The modelling method enabled us to offer various perspective models of protection and the functioning of modern Ukraine's border.

The combination of these principles and research methods helped to avoid subjective assessments, enabled us to approach the scientific validity of the research results, and presented the material in a consistent and logically complete form, more thoroughly reflecting the essence of Ukraine's border models of protection and functioning, especially on its Ukrainian-Polish part.

4. RESULTS AND DISCUSSION

Modern research suggests three common models of state border security. Those are: (1) enclosing (border walls), (2) a joint system of state border security, and (3) a model of a mutual cross-border space. These models were proposed by P. P. Lysak (2014) and V. S. Nikiforenko (2015) in their research papers about foreign experiences in implementing security policies and protecting state borders.

The enclosing model (a border wall) is a unilateral strengthening of the border through the construction of border walls or other barriers. Experts call this model "the Great Wall of China." Its goal is to protect itself from hostile threats or to isolate itself from a weak neighbouring country. This model has some drawbacks, among them significant expenses associated with the construction and maintenance of border infrastructure, a deterioration of relationships with a neighbouring state, or the severance of relations. An advantage of a unilateral strengthening of the border is defence against military threats, invasion, terrorism, and the penetration by illegal immigrants. The last example is the reason why Donald Trump, US president at the time, tried to build a border wall and defend Mexico (IPress.Ua, 2017). The purpose of the wall was "to become a barrier to illegal immigration from Mexico, as well as an obstacle to drug trafficking" (Sjogodni. Svit, 2018). Annually, around 350,000 illegal immigrants arrive in the U.S. A vast majority of them are Mexicans. The border between the United States and Mexico is 3200 km long and there are already barriers at almost 1100 km of it. Another

example of the most guarded border in the world can be found on a 248-kilometer line between North and South Koreas. There are approximately 2 million military personnel there. The border between these countries still remains a permanent obstacle to the uncontrolled interaction of neighbouring states (TSN.Svit, 2018).

The joint system security model was formed in 1990–2000. Its specific feature is the attempt of both sides to prevent the invasion of terrorists or lone militants through legal or illegal channels. This model has been implemented at the borders of Israel, Egypt, and the Palestinian National Authority, as well as between India and Pakistan. Externally, the border system appears peculiar and resembles a structure that consists of several rows of high metal barriers. They are equipped with obstacles, sensors, surveillance cameras, etc. It should be noted that Indian and Israeli barrier systems are intended to kill violators rather than detain them. Thus, there are not only surveillance systems or sensors, but also electrified and mined systems. At night, border guards have the right to shoot potential trespassers on sight. Barrier transparency is considered a drawback of this model as it helps violators and terrorists using it for their advantage, when they pass through border easily.

The aim of the mutual cross-border space model is to counteract mass uncontrolled migration. In modern times, this model is used by the U.S. and Mexico, India, Bangladesh, and Myanmar, Saudi Arabia, Iraq, and Yemen, Botswana, and Zimbabwe. There are obstructions only at the most problematic sections of a border. "Humane" border hurdles are aimed at stopping violators, not killing them. Since neighbouring states have quite active cross-border connections, lots of migrants can enter an appealing neighbouring country legally. As practice shows, this model presupposes most citizens are law-abiding people, which is the reason why the effectiveness of the barriers against illegal immigrants is quite low. When undocumented immigrants cross the border, they damage it by making tunnels while trying to traverse the barrier. There are corrupt practices among border guards. Surveillance cameras, infrared and seismic detectors, and other devices do not produce the expected results.

We should mention that a similar model has existed on the border between Ukraine and Russia for 23 years, since Ukraine gained its independence. In September 2014, the former prime minister of Ukraine Arsen Yatseniuk announced his intention to build a wall at the border with Russia. He called this project a "European rampart". He was actively involved in the construction of the wall on the border between Ukraine and the Russian Federation, but after his resignation, the completion of the construction ceased to be mentioned (POLITEKA, 2018). The State Border Guard Service (SBGS) of Ukraine claims that less than a third of the wall at the border with Russia has been completed. Initially, it was planned that fortifications worth more than UAH 8 billion would be built at the border. Later, the project budget was reduced significantly, to UAH 4 billion. The SBGS has already spent approximately UAH 800,000. According to law enforcement

officers, a part of the funds was spent for other purposes, while some of the funds were stolen. The National Anti-Corruption Bureau of Ukraine and the Prosecutor General's Office of Ukraine conducted two separate investigations into the construction. They have estimated total losses at more than UAH 100 million. While such significant funds were spent on "the project" from the state budget, it is successfully used by many Ukrainian politicians only for PR purposes (Eksklyuzyv "Hordona", 2018).

Nonetheless, in the modern context, the border security model has gained new advantages and requires a broader interpretation, which should be based on systematic and synergistic approaches to the concept of state borders. In contemporary works, the term "state border security model" is used together with another term, i.e., "integrated system of state border security." In order to create a modern integrated system of state border security for Ukraine and independent rights in its exclusive (maritime) economic zone, the following actions are considered:

– to create cross-border guard departments that will conduct operational, technical, and physical protection of state borders, border control, and passing through the state border of persons, vehicles, goods, and other property in conformity with rules, detect and stop cases of illegal movement, and ensure compliance with state border and cross-border regimes;

– to improve the protection of state borders outside checkpoints by introducing a data acquisition system on illegal activities and forming an engineering system;

– to advance a cross-border control by deploying the latest technical systems and networks, including biometric control, as well as to introduce joint control with the relevant authorities of neighbouring countries on the movement of persons, vehicles, goods, and other property at border crossings;

– to reform mobile units into units that are capable of carrying out special measures to secure state borders independently according to the level of professional training of personnel, technical equipment, and support;

– to increase the operational component in the system of measures for the protection of state borders;

– to reform the Ukrainian Sea Guard;

– update the technology used by state border guards;

– to create technical bodies for state border security;

– to improve communication systems, including the formation of automated information systems;

– to enhance cooperation with law enforcement agencies of Ukraine and neighbouring countries.

Moreover, authorities will pay more attention to measures that will develop operational and search activities, reform the Sea Guard, and advance communication systems (Verkhovna Rada Ukrayiny, 2006). Thus, a model of state border security becomes an integrated system designed to implement cross-border policy objectives and ensure a high level of border security. This model should be based

on the principles of the border policy of Ukraine. Moreover, it should be aimed at ensuring a sufficient level of border security (Lytvyn, 2010). This model is executed through the functions of the border institution, as well as guaranteed by the integrated border enforcement (Kontseptsiia, 2015). These approaches to understanding the model of state border security, as well as the extrapolation of the positive features and practices in security and functioning of the Ukrainian-Polish border on the modern Ukrainian border within different time frames, helped to design proposals for different ways of its protecting and functioning. Based on R. Kotsan's (2012, 2021) research, the following progressive models of border security and operation can be proposed (see the table below).

Table 1. Ukraine's boundary progressive models of security and operation

Name of model	**Model of border security**	**Predominant measures of border security**	**Model of border operations**	**Border regions of Ukraine**
Strict	Military	military regime counterintelligence operational-search	strict political strict economic	Ukrainian-Russian and Ukrainian-Belarusian since February 24, 2022
	Military/ technical	military regime counterintelligence operational-technical	strict political strict economic	Ukrainian-Russian maritime boundary
Partially strict	Operational	regime counterintelligence operational-search operational-service	symmetrical asymmetrical	Ukraine-Belarus until 24 February 2022
Crisis	Operational	regime counterintelligence operational and investigative operational and service	symmetrical asymmetric simplified	Ukrainian-Polish, border with EU countries
Partially liberal (partially mild)	Operational-technical	operational technical regime	symmetrical asymmetrical	Ukrainian-Romanian maritime boundary
	Operational	operational-service operational-search regime	symmetrical, asymmetrical, selectively simplified	Ukrainian-Moldavan border with EU countries
Liberal (mild)	Monitoring	analytical informational operational-search operational-service	open	border with EU countries (in prospect)

Source: own work.

The presented description of the models of border security and operation, as well as their characteristics indicates that, for instance, a partially liberal model can include the operational model of border security (in the Ukrainian-Moldovan section and the border with EU countries) and the operational-technical security model (at the sea border between Ukraine and Romania), as well as such models of operation as symmetric, asymmetric, selectively simplified. All points above concern the Ukrainian-Polish border. With Ukraine's accession to the EU, a liberal model will become possible at this border section in which a monitoring model of border security and an open model of operation fit well. In this case, border transformations are feasible, while its operation will occur on the new qualitative basis.

The operational model of state border security will involve a system of the following measures: operational/service, operational/search, and established procedures. Border security institutions and their subordinate departments will implement them. This model can be applied at the Ukrainian-Moldovan border, as well as in border areas with EU countries. The operational-technical model of the state border will be characterised by a system of operational, technical, and established measures that will be applied in order to ascertain the surface situation and timely detect any violations regarding navigation, stay, and entry (exit) of non-military and military vessels into internal waters, the territorial sea, and exclusive (marine) economic zones. It is expedient to introduce the operational-technical model of state border security at the maritime border with Romania.

The monitoring model of state border security will apply operational/service, operational/search, informational, and analytical measures. Border security institutions and their subdivisions will implement them. This model is feasible under the condition of Ukraine's accession to the EU and it will be obtained for the area of Ukraine's border with EU countries. In this case, the status of the border, cross-border regime, and border area rules will change, as well as the adjacent border areas will reach the stage of full integration. Different models of border functioning will correspond to the models of state border security considered above. Thus, symmetrical, asymmetrical, and selectively simplified models of functioning will correspond to the operational and operational-technical models of border security. At the same time, the monitoring model of state border security will be characterised by an open model of functioning. Below, we will describe each model of state border functioning in detail.

The asymmetrical model has its peculiarities and is presented in states, one of which has introduced visas in order to cross borders, while another country has not. The elements of this model have actually existed between Ukraine and Poland for more than a decade. At the request of the EU, Poland introduced visas for Ukraine in 2003, which took place in accordance with the Agreement on the Conditions of Travel of Citizens (Stokłosa, 2012). Ukraine applied the asymmetrical principle. Ukraine did not introduce visas for citizens of Poland and anticipated that the Polish government would take similar actions. Since then, the issue of

visa waivers for Ukrainian citizens has been raised repeatedly. The Polish government took some measures towards that, in particular, the Agreement on rules on local border traffic, the exclusion of payment for the Poland National Visa, the Polish Card ("Karta Polaka"), etc. However, only the requirements for processing and issuing visas were altered. These actions diluted the classic asymmetrical model (Papish, 2013). The asymmetrical visa regime had remained decisive in Ukrainian-Polish border relations until Ukraine obtained a visa-free regime with the EU. The asymmetrical model can be present from the perspective of economic protection of the state border. A country can unilaterally protect the national market from unwanted products or from their excessive amounts by imposing custom tariffs or non-tariff regulations, such as quotas, licences, etc.

The symmetrical model of border operation implies that neighbouring states introduce a bilateral visa regime (customs and non-tariff regime for the regulation of foreign economic activity). This model can be found between states that do not see their prospects in one integration group or have different geopolitical and economic interests.

The selectively simplified model of border operation is based on a differentiated approach to border crossing. In this case, a simplified border crossing procedure is introduced for individuals against the background of the general visa regime for the vast majority of the population. This model is implemented on a national and territorial basis provided that there are family, historical, or cultural relations between the citizens of neighbouring states. It emerges in the context of the asymmetrical model when one state cannot cancel the visa regime, while for another state it is not beneficial to introduce it. Thus, countries seek a compromise in order to simplify border crossing terms. This model existed at the Ukrainian-Polish border by 2017 (Poljsha v Ukraini, 2021). A 30 km wide border zone was created on the territory of Ukraine, in which the visa regime was practically abolished. In order to cross the border, citizens who live within this area were required to only present a passport and a document that specifies a place of residence within the border. For the residents of the 30 km border area, a 7-day shopping visa was introduced (Babij, 2018). Its presence simplified and expedited the procedure for obtaining multiple Schengen visas in the future. Not only the areal principle of border crossing was used, but so was a national one. Citizens of Ukraine who proved their Polish origins or family relations were issued a "Polish Card" to cross the border visa-free (Jurydyzna dopomoga inozemzjam v Poljshi, 2018). The EU's introduction of the visa-free regime for Ukraine in 2017 was a significant decision (Ievropejska Pravda, 2017). After it was implemented, the citizens of Ukraine have become able to travel to Poland and other Schengen countries (except for the United Kingdom and the Republic of Ireland) without the need to obtain an entry visa for the destination country. This model was the first step on the way to the implementation of an open model of state border operation (Kotsan, 2012).

The open model of border operation has some peculiarities and involves a free flow of goods, people, finances, and services across the border. It is feasible under the condition of Ukraine's accession to the EU. In this case, the status of the border will change significantly. According to the new status, the mode of operation of the border will also be altered. The explained open model can be applied gradually to Ukraine. At the first stage, the economic element of the border is transformed. Border and customs controls are cancelled. Visas are abolished. Goods, funds, services, and individuals transit freely. The next stage is accession to the Schengen zone, which results in the cancellation of passport control. The analysed open model of border functioning can be applied to the border with EU countries and to the Ukrainian-Polish border in particular. Many scholars and specialists believe that the legal framework for the development of relations within the Eastern Partnership is an important step towards open and transparent borders within Europe. The European Community interprets the Eastern Partnership as part of the European Neighbourhood Policy. Thus, this example becomes the EU's framework policy towards neighbouring countries (Ministerstvo zakordonnykh sprav Ukrainy, 2021).

In May 2008, Poland, in cooperation with Sweden, presented "the Eastern Partnership" joint initiative at the European Council. The Eastern Partnership project was launched at a special summit in Prague on 7 May 2009. This project is a specific Eastern dimension of the European Neighbourhood Policy. It is based on the desire to foster various forms of regional and subregional cooperation. Primarily, it is a result of the EU's aspiration to create a zone of stability as new borders (Holdun, 2009). Participants in the project include EU Member States, as well as Ukraine, Moldova, Belarus (its participation depends on the development of relationships with the EU) and the countries of Transcaucasia (Azerbaijan, Armenia, and Georgia).

The main objectives of the project concerning Ukraine are:

– further the process of liberalisation of the visa regime;
– establish a free trade area;
– maintain the adaptation of the legal and regulatory framework, strengthen the institutions of the partner-countries;
– cooperate in the field of energy security;
– create an integrated border management system (Eastbook.eu, 2020).

The complicated and dynamic security environment of Ukraine demands alterations in border management approaches. In recent years, Ukraine has taken a number of actions to introduce a modern, consistent, and coordinated border management system, i.e., the integrated border management (IBM). Currently, the main issues on the way to introduce IBM are:

– new threats, in particular: the aggression of the Russian Federation in certain areas of the Donetsk and Luhansk regions, the invasion of the Autonomous Republic of Crimea and Sevastopol and the Russian-Ukrainian war since 24 February 2022;

– exacerbation of the migration crisis in the EU countries that border Ukraine;

– incompleteness of measures on contractual and legal establishment of the state border;

– the need to introduce European standards for different types of control at the state border (cross-border, customs, etc.);

– the need to improve international, interstate, and interagency cooperations regarding the control and transit of citizens, goods, and vehicles at checkpoints.

"The Concept of Integrated Border Management" has already been developed and approved by the Cabinet of Ministers of Ukraine (27 October 2010 No. 83; 28 October 2015 No. 1149). The implementation of the Concept will provide an opportunity to "introduce European standards of integrated border management, enhance international, cross-border, and interagency cooperation, coordinate the efforts of authorised state bodies to comprehensively and flexibly respond to current threats to state border security and ensure its openness" (Kontseptsiia, 2015). The EUBAM mission assists Ukraine in making progress in integrated border management.

The integrated border management as well as the policy of EU neighboring states to Ukraine helped to respond quickly to the situation with migrants, which appeared on the EU borders since the beginning of the Russian-Ukrainian war on February 24, 2022. According to the UN, as of early March over 1.7 million civilians have left Ukraine due to the Russian invasion. The EU expects an influx of 4 million refugees. They cross Ukraine's western borders with such neighbouring countries as Poland, Romania, Slovakia, Hungary, and Moldova. Poland has already received 1,027,603 refugees, Hungary – 180,163, Moldova – 82,762, Slovakia – 128,169, and Romania – 78,977. Since 24 February 2022 the mentioned states have significantly simplified border crossing procedures for Ukrainian citizens fleeing the war. In particular, they have allowed crossing the border with a domestic or foreign passport, birth certificate of children and medical documentation. In Poland and other countries bordering Ukraine, people can stay in refugee centres and receive medical care and food. The EU is preparing to give Ukrainians fleeing the war the full right to stay and work in 27 countries for up to three years. Also, on 4 March 2022, the EU intensified temporary protection for Ukrainian citizens fleeing the Russian war. The EU Council took this decision at a meeting in Brussels. It should be noted that in 2001 the special EU Directive about temporary protection has been adopted, but since then has been never activated. The Directive was applied to all EU countries except Denmark. Since 4 March 2022 it began to be applied for Ukrainians.

It can be stated that in the conditions of Russian aggression and the beginning of a large-scale invasion of Russian troops into the territory of Ukraine, a new "Crisis model of the functioning the Ukrainian border with the EU, including Poland" is being formed. The model consists in coordinating the efforts of various agencies (both Ukrainian and EU), improving international and cross-border cooperation, coordinating the work of government agencies to respond quickly

and flexibly to the migratory, peak-free situation that is unfolding today. The introduction of the "Strategic Compass" fits the "Crisis" functioning model of the Ukrainian border at the section with the EU. Security and defence documents define an action plan to ensure the EU's internal security. The compass covers all aspects of security and defence policy and is structured around four pillars: to act, to invest, to cooperate, and to secure.

In contemporary Ukraine, there is a steady trend towards a differentiated approach to building state border security in different regions of the country, while considering the level of their security, economic and social development, the degree of threats in the border area, as well as the transition to integrated border management and the implementation of various border security models at their frontiers.

5. CONCLUSIONS

We have discussed new models of security and functions of Ukraine's border, particularly strict, partially strict, partially liberal (partially mild), and liberal (mild). We have emphasised that a partially liberal model should be used for the Ukrainian-Polish and Ukrainian-Moldovan borders and all borders with EU countries, including the maritime border with Romania. Under the condition of Ukraine's accession to the EU, a liberal model should be applied to this border section. In this case, the border would transform and function on a new qualitative basis. We have emphasised that as the result of the Russian aggression against Ukraine the "crisis" model of protection and operation of the Ukrainian-Polish border and the border of Ukraine with the EU has emerged. This model is provided for a rapid response to the growing number of refugees from Ukraine, assistance to them, and regulation of their housing, employment, access to health care, etc. The existence of a crisis model has prompted the EU to pursue a policy of insecurity, including the adoption of the Strategic Compass. The implementation of the new models of Ukrainian border security and operation should occur along with the following processes: transition to integrated border management; improving the legal framework of the state; enhancing the operation of border security institutions; establishing a multi-level cooperation, from cooperation with border residents to inter-agency and international cooperation on the control and transit of persons, goods and vehicles across state borders. We have also concluded regarding other security and functioning models that: a strict model should be applied to the Ukrainian-Russian border (at both its land and maritime sections) while a partially strict one should be conducted at the Ukrainian-Belarusian border.

In further research, we would consider tracking the implementation of the proposed models of security and operation of Ukraine's state borders.

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Claudia BURLANDO, Enrico MUSSO, Luca PERSICO

THE ELDERLY AND URBAN MOBILITY: COST SENSITIVITY OF ELDERLY PEOPLE IN THE "OLDEST" ITALIAN CITY

Abstract. The world is facing a series of changes that will modify the way we envisage transport planning in our cities. Demographic ageing as a consequence of higher life expectancy and lower fertility rates is a world-wide phenomenon. While ageing is indeed a triumph of scientific progress and increasing longevity is perceived as one of humanity's greatest achievements, the transition in society needs to be managed. In the urban context, any increase in age, health, and economic conditions determines one's ability to enjoy the urban milieu and the so-called economies of urbanisation (advantages gained from an urban location, e.g., proximity to a market, labour supply, good communications, and financial and commercial services) longer. As there are more and more elderly people in cities, urban mobility becomes crucial in making the urban environment more inclusive. In order to provide suitable policy guidelines, it is, therefore, necessary to investigate and understand senior traveller behaviour.

In this study, we investigate urban travel characteristics of people aged 65 years and over living in the city of Genoa (one of the cities with the largest population of the elderly in the EU). By utilising a structured questionnaire, the paper explores the satisfaction and motivations of approx. 600 elderly public transport users in the city. In particular, exploratory factor analysis has been used to determine the key dimensions of the satisfaction and mobility motivations, and subsequently to use them to investigate the cost sensitivity of elderly people.

Key words: the elderly, urban mobility, cost sensitivity of elderly people.

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1. INTRODUCTION

Life expectancy at birth has reached 80 years in over 30 countries. While at present only Japan has an elderly population accounting for more than 30% of its population, by 2050 64 countries are expected to join Japan.[1] (UN, 2013). The ageing process is most advanced in high-income countries. Japan (33% were aged 60 years and over in 2015) is followed by Italy and Germany (28% aged 60 years and over), and Finland (27%) (UN, 2015).

The number of elderly people in the world is projected to grow by 56%, from 0.9 billion to 1.4 billion between 2015 and 2030 (Szeto *et al.*, 2017). The demographic shift, as a consequence of higher life expectancy and lower fertility rates, is occurring worldwide, and particularly in developed economies (Oeppen and Vaypel, 2002; Bricocoli *et al.*, 2018).

A rise in age, health, and economic conditions increases the opportunities to enjoy what the urban environment and the milieu have to offer (Alsnih and Hensher, 2003; Banister and Bowling, 2004; Lutz *et al.*, 2008; Coughlin, 2009; Rosenbloom, 2009; Dobbs *et al.*, 2016). However, that use is bound (or limited) by the accessibility to places or services. Urban mobility planning becomes a vital tool towards a more friendly and inclusive urban environment (Banister and Bowling, 2004; Beria *et al.*, 2012; van den Berg *et al.*, 2016).

Today's elderly significantly differ from previous generations: they are wealthier, healthier, and more mobile, as well as more numerous than in the past as a consequence of the generation of baby boomers reaching old age (Rosenbloom, 2001; Currie and Delbosc, 2010). This is the first time that such a change has taken place between two generations (Lutz *et al.*, 2008; Lanzieri, 2011; Szeto *et al.*, 2017; Mariotti *et al.*, 2018).

While today's elderly live longer than any generation before them, they are not necessarily happy to retire at 65 and count the days until they enter a nursing home. Life after retirement has been growing over the years (Fig. 1) and this causes a longer period of activity and opportunities for current generations compared to the previous ones. On average, in 2020 the life expectancy at birth was 74 years for women and about 70 years for men; however, the valuesare forecast to increase. The same projected growth is observed for life expectancy after age 65 which now stands at 17 years and is expected to rise to 19 years by 2050; that is a considerable time that is worth living well (OECD, 2019).

As Hjorthol *et al.* (2010) have indicated for for Northern Europe, car ownership and use by the elderly has been increasing over the last 20 years, with a higher trip rate and more activities outside the home compared to the same age groups of 20–25 years ago.

[1] We have adopted Eurostat and Istat (Italian Insititute of Statistics) age groups, i.e., the elderly: over 65; adults: 15 to 64; young people: 0 to 14. The ageing index is the ratio of the population over 65 to the population aged between 0 and 14; the elderly dependency index is the ratio of the population over 65 to the population aged between 15 and 64.

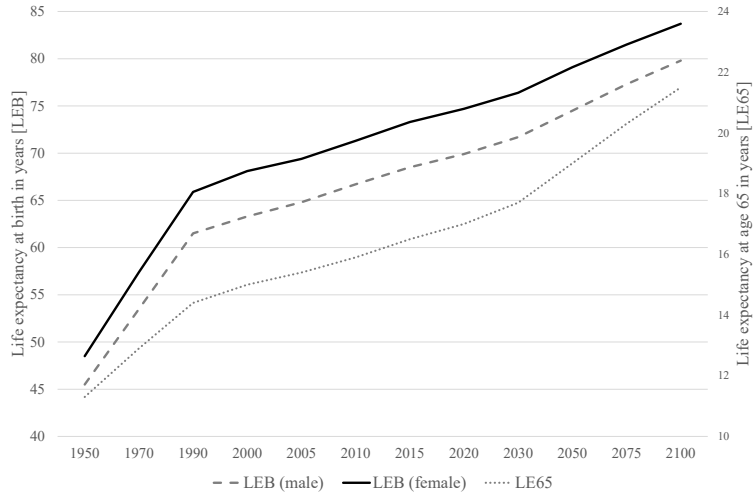

Fig. 1. Life expectancy at birth (male vs female) and life expectancy at age 65 from 1950 to 2100
Source: UN, Department of Economic and Social Affairs, Population Division. World Population Prospects 2019, Volume II: demographic profiles.

A longer post-retirement life, along with better health and economic conditions, generate the desire and opportunities for mobility, whose link to the quality of life has been widely acknowledged in literature (Metz, 2000; Banister and Bowling, 2004; Preston and Rajé, 2007; Nordbakke, 2013; Nordbakke and Schwanen, 2014; Ryan *et al.*, 2015). It has become necessary to re-think urban transport options to match the needs of an ageing population while maintaining their well-being and quality of life. This is a complex task requiring in depth studies of senior travel patterns and mobility needs in order to implement successful planning strategies. To provide suitable polices it is necessary to first investigate travel behaviours and the needs of elderly people.

Within this context, our analysis aims at studying travel behaviour of elderly people, through an exploratory factor analysis performed in order to evaluate the key dimensions of satisfaction and mobility motivations, and investigate the cost sensitivity of elderly people.

The survey applied to Genoa. Why is one Italian city such an interesting scenario to investigate the connection between ageing and urban mobility planning? Statistics are a useful tool to answer this question (Burlando and Cusano, 2018).

Italy is one of the countries with the longest life expectancy: almost 81 years for men and 85 for women. While facing a decrease in the birth rate, the country also shows a significant demographic imbalance. With 170 elderly people for every 100 young people, Italy is the second oldest country after Japan (ISTAT, 2018), with 20-year forecasts estimating an even greater imbalance: 265 elderly people for every 100 young people (ISTAT, 2018).

Eurostat figures (2018) have revealed that Italy has the highest number of people aged 65 and more in Europe, accounting for 22.3% of the population (followed by Greece at 21.5%, and Germany at 21.2%) and the worst elderly dependency index at 34.8% (in comparison to the EU average of 29.9%).

The average life span of Italians (around 85 years for women and 81 years for men: ISTAT, 2018) tops the EU ranking. After retirement, a 65-year-old men can expect to live another 19.1 years, while women may live up to a further 22.3 years on average (ISTAT, 2016).

Among all urban areas with populations exceeding 250,000 in the EU Member State with the oldest population (according to ISTAT data), Genoa has the highest share of people aged 65 and more (28.6%), the worst elderly dependency index (47.5%), and the highest average age in Italy (48.9). Genoa as the oldest city in the country with the oldest population in the EU is an obvious candidate for a case study.

Therefore, it seems crucial to ensure that within the ageing process quality of life is ensured at a certain level. Sadly, these aspects appear to be underestimated in Italy by the academia, urban transport planners and practitioners, as well as in policymakers' agendas. This great demographic change demands significant strategic (Buffel *et al.*, 2012; van den Berg *et al.*, 2016) given the effects of ageing on the environment, on mobility patterns (Rosenbloom, 2001), and on transport systems (Alsnih and Hensher, 2003; Buehler and Nobis, 2010; Van den Berg *et al.*, 2016).

Italy has one of the oldest populations in the EU, while the population of Liguria and its capital Genoa are the oldest in Italy. Located in the historically industrialised North West of Italy, with a population of 580,000 and 240 sq. km, Genoa displays one of the worst demographic trends in Europe: 28% of its inhabitants are aged over 65, the old-age index (the ratio of people over 65 to people under the age of 14) exceeds 250% and the average age is over 48. We consider the city as a significant possible example and believe that the findings and their discussion can be "food for thought" for policymakers and researchers working on urban transport planning in the context of ageing.

2. METHODS

2.1. Sample description and research design

The empirical research was based on the development of a structured questionnaire based on personal interviews of a sample of approx. 605 elderly public transport users (over 65 years of age) from the city of Genoa. The sample was proportionally stratified on the basis of gender and age of respondents. The random sample was interviewed following the CAPI (computer assisted personal interviewing) method.

In particular, the sample was divided into 4 different age groups: 65–70, 71–75, 76–80, and over 80; the need for a proper age segmentation has been confirmed by several studies that disaggregated the "elderly" category into different sub-categories with very specific needs (Alsnih and Hensher, 2003; Currie and Delbosc, 2010; Mandl, 2013; Coughlin, 2009; Haustein, 2012; Kim and Ulfarsson, 2004; Siren and Haustein, 2013).

Table 1. Sample and population description with respect to the stratification variables

SEX	**sample [%]**	**population [%]**	**AGE**	**sample [%]**	**population [%]**
Male	42	44	65–69	21	23
Female	58	56	70–74	24	24
			75–79	26	21
			> 80	29	32

Source: own work.

After the data has been cleaned, the sample is adequately balanced with respect to the stratification variables. In particular (Table 1), the sample comprised for the most part women (58%), the average age being 75, with a significant share of people over 80 (approx. 30%). Most interviewees (64%) still held a driving license, while 16% no longer held one. The number of driving license holders remained high (40%) even among the over 80 bracket.

The questionnaire consisted of three sections: the first section included biographical information of the respondents (sex, age, employment status, and qualification); the second one investigated their urban mobility habits (daily number of movements, frequency of movements, means of transportation, etc.); the last section evaluated the satisfaction regarding local public transport and the motivation to use it. This section includes questions concerning user opinions on the quality of public transport, pedestrian mobility, and the use of urban roads in general. These questions were organised as sets of ten-point scales comprising 18 items divided into two sections: satisfaction about public transport (related to elements such as frequency, punctuality, information, security, and comfort), and about road and sidewalk conditions (related to maintenance, cleaning, lighting, and security).

2.2. Data analysis and results

Data analyses were performed in two steps. First, an exploratory factor analysis (EFA) was performed on the 18 items included in the last part of the questionnaire in order to better understand the multivariate structure of the satisfaction measures (Table 2).

Table 2. Results of EFA on the 18 satisfaction items (factor loading < 0.5 omitted)

	Explained variance [%]	Cronbach's alpha	Factor loadings	Mean	SD
Factor 1. Pedestrian Mobility (PMOB)	41.86	0.854			
Sidewalk condition			0.678	3.891	0.088
Street maintenance and cleaning			0.722	3.988	0.089
Crosswalk			0.644	5.992	0.085
Street lighting			0.642	6.104	0.081
Urban security			0.663	5.787	0.078
Condition of stairs			0.582	4.779	0.080
Factor 2. Time factor (TIME)	12.02	0.867			
Travel time			0.505	5.860	0.073
Waiting time at bus stop			0.795	5.202	0.083
Frequency			0.782	5.198	0.080
Punctuality			0.642	5.949	0.083
Factor 3. Security perception (SECU)	6.05	0.818			
Information on board			0.541	5.555	0.101
Information at bus stop			0.501	6.159	0.092
Security at the bus stop			0.617	6.365	0.078
Security on board			0.565	5.874	0.081
Courtesy of the driving staff			0.575	6.617	0.088
Factor 4. Overall comfort (COMF)	5.33	0.834			
Comfort at the bus stops			0.627	5.316	0.083
Comfort on board			0.696	5.008	0.084
Ease of entry/exit			0.573	5.050	0.088

Source: own work.

The factors were extracted using the principal component method. The total number of factors (4) was defined using the Keiser criterion. Thus, we guaranteed the percentage of cumulative explained variance greater than 65%. To measure the appropriateness of the factor analysis, we have calculated Bartlett's sphe-

ricity test (p-value < 0.001) and the Keiser Meyer Olkin index (KMO = 0.9143) and we have concluded that correlations in the dataset exist and are appropriate for the factor analysis, and sampling adequacy is good. In order to simplify the factor structure and make its interpretation more reliable, we performed a varimax rotation. To check the reliability of each factor, we finally calculated the Cronbach's alpha among items, for each extracted factor.

As reported in Table 2, Factor 1 (PMOB) included six items (i.e., sidewalk conditions, street maintenance and cleaning, pedestrian crossings, road lighting, urban security, and the condition of stairs). The internal consistency was good as Cronbach's Alpha for this factor was 0.854. This factor explains 41.86% of the total variance and, due to its inner composition, was called pedestrian mobility.

Factor 2 (TIME) explained 12.02% of the total variance and loaded all items related to punctuality and frequency of local transport (travel time, waiting time at the bus stop, bus frequency, and punctuality). The internal consistency was also good (Cronbach's Alpha = 0.867).

Factor 3 (SECU) included all items connected to passenger perception of security and peace of mind (information on board and at the bus stop, security on board and at the bus stop, and courtesy of on-board personnel). It explained 6.05% of the overall variance and had a good internal consistency.

Finally, factor 4 (COMF) included all items connected to the ease and comfort of travel (comfort at the bus stop, comfort on board, and ease of entry/exit) explaining 5.33% of variance.

After Exploratory Factor Analysis (EFA), the four factors extracted were used to investigate the determinant of cost sensitivity of elderly people. Thus, a regression model was performed to test the impact of the four factors (PMOB, TIME, SECU, COMF) on cost sensitivity (CSEN). The dependent variable was obtained from a specific question in the second part of the questionnaire which asked respondents to evaluate the importance of the cost of public transport (on a four-point scale ranging from 1 to 4). Being the dependent variable an ordinal variable, a proportional odds model (ordered logistic regression) was used instead of ordinary least square regression.

In addition, seven control variables were included in the regression analysis as extant literature identified them as relevant drivers for cost sensitivity (Hunt, 2001; Paulley *et al.*, 2006; Craig and Tienoven, 2019). Most of them were related to biographical characteristics (Meyer and Speare, 1985; Rosenbloom, 2004; Scheiner and Holz-Rau, 2012; Chao, 2019): SEX, AGE, QUAL (qualification), DLIC (driving license), EMPL (employment), WMOV (work-motivated movement), FMOV (family-motivated movement), and CARR (car usage reduction). All variables were operationalised as reported in Table 3.

Table 3. Definition and operationalisation of dependent, independent, and control variables

Code	Variable	Operationalisation
	Dependent variable	
CSEN	Cost sensitivity	four-point scale from 1 to 4
	Independent variables (Satisfaction factors extracted from EFA)	
PMOB	Pedestrian mobility	The operationalisation of the four independent variables were based on factor analysis (FA) outcomes. Each variable was calculated as a mean of all the items included in the corresponding factor
TIME	Time factor	
SECU	Security and self-confidence	
COMF	Comfort factor	
	Control variables	
SEX	Sex of respondent	Dummy variable: 1 male; 0 female
AGE	Age of respondent	Integer number >= 65
QUAL	Qualification of respondent	Dummy variable: 1 if a respondent had a Bachelor's degree or higher; 0 otherwise
DLIC	Driving licence	Dummy variable: 1 if a respondent did not have a driving licence; 0 otherwise
EMPLO	Employment	Dummy variable: 1 if employed; 0 otherwise
WMOV	Work-motivated movement	Number of weekly movements due to working motivations on the total movements of the week
FMOV	Family-motivated movement	Number of weekly movements due to family motivations on the total movements of the week
CARR	Car usage reduction	Dummy variable: 1 if a respondent had the intention to reduce car usage; 0 otherwise

Source: own work.

The results of the ordered logistic regression model, reported in Table 4, show an overall high significance of the model (LR Chi-squared = 52.38, dof = 12, p-value < 0.001).

The results of the regression (Table 4) show that two of the four components extracted with EFA, pedestrian mobility (PMOB) and Security and self-confidence (COMF), present a significant impact on cost sensitivity of elderly people. Both affect cost sensitivity negatively. Moreover, three other variables seem to affect cost sensitivity: two of these negatively (SEX and AGE) and the third positively (CARR). However, the other seven variables do not seem to be significant. To check the robustness of the results, we compared the Full model results (regression model which considers all the variables previously introduced) with the model obtained by selecting variables with a stepwise criterion. After a stepwise

selection, the resulting model is preferable in terms of AIC (Akaike Information Criterion): the significance and sign of all variables are confirmed; in addition, another variable is now significant and negatively signed (QUAL).

Table 4. Ordered logistic regression analysis results

	Full Model				***Stepwise regression model***			
	Estimate	**SE**	**z-value**		**Estimate**	**SE**	**z-value**	
PMOB	- 0.2124	0.0878	- 2.420	**	- 0.2289	0.0866	- 2.640	***
TIME	0.0415	0.0907	0.460					
SECU	- 0.0702	0.0969	- 0.720					
COMF	- 0.1935	0.0998	- 1.940	*	- 0.2002	0.0983	- 2.040	**
SEX	- 0.3201	0.1629	- 1.970	**	- 0.3658	0.1550	- 2.360	**
AGE	- 0.0257	0.0121	- 2.120	**	- 0.0271	0.0118	- 2.290	**
QUAL	- 0.2894	0.1700	- 1.700		- 0.3247	0.1621	- 2.000	**
DLIC	0.3010	0.2098	1.430					
EMPLO	0.1895	0.3443	0.550					
WMOV	- 0.0038	0.0125	- 0.310					
FMOV	0.0133	0.0088	1.510					
CARR	0.5654	0.1655	3.420	***	0.5559	0.1646	3.380	***
cut1	- 3.5776	0.9713			- 3.9446	0.9199		
cut2	- 1.6820	0.9613			- 2.0790	0.9081		
cut3	0.4808	0.9626			0.0626	0.9081		
AIC	762.79				753.27			

*p-values codes: *p < 0.10; **p < 0.05; ***p < 0.01*

Source: own work.

3. CONCLUSIONS

The data provided in the previous sections highlights some interesting results, namely concerning the importance attributed to the out-of-pocket cost compared to other factors influencing travel demand patterns and their variability.

As far as demographics are concerned, the most interesting evidence appears to be related to the age and gender of respondents. From the first point of view, it emerges that as user age increases, the importance ascribed to the monetary cost decreases. This is certainly due to fewer trips being made (from about 4 trips per

day on average in the 65–70 class to 3 trips per day for those aged 80 and more) and probably to the higher share of pedestrian trips and journeys as car passengers, both resulting from available data.

Then the importance assigned to the monetary cost seems to be smaller for men than women. This is probably (at least partly) due to a higher average level of income and wealth of the former compared to the latter. In Italy, the average amount of net workplace pensions for women amounts to only 60.5% of those for men (see ISTAT, 2019). Furthermore, the sample includes some professionally active people, who more often were men (6.4%) than women (1.6%) (see OECD, 2017) – whose price-flexibility of travel demand is lower than for journeys for leisure and family organisation.

Moreover, a higher level of education of users is normally associated with less importance assigned to the monetary cost of trips. This factor is possibly responsible for the direct link between the importance ascribed to the cost and the intention to reduce the use of private transport, which may be due to a greater awareness of the issues related to transport sustainability, which in turn could be the consequence of a higher level of education. However, such a link appears to be far more complex and requires further research.

Finally, and possibly connected to previous elements, it appears that the higher a respondent's evaluation on the quality of pedestrian mobility, the lesser the importance attributed to the monetary cost of trips. It follows that the higher evaluation of pedestrian mobility, the more trips are made on foot and the less importance given to the cost of public transport.

Predictably, a positive assessment of the level of comfort in public transport does result in less importance given to its monetary cost, as indicated by, e.g., Smith, 1988; Hebel and Wyszomirski, 2018; and Ingvardson and Nielsen, 2019. Conversely, the level of comfort which is judged inadequate will cause greater attention to the out-of-pocket cost, as this will be more likely to be considered unacceptably high by the users.

3.1. Implication for policy guidelines

From the point of view of possible policy guidelines – albeit the evidence of this survey should be confirmed and strengthened by ad hoc analysis – it is worthwhile indicating that some "natural" trends push towards the reduced importance of the monetary cost as a factor influencing how the elderly travel. This is the case of ageing itself, not only as the natural individual process, but also an increase in the average age of population, both overall and (what is more relevant here) in the segment of elderly people. The growing activity rate of an older population is also significant, not only as far as jobs are concerned, but also in other lifestyle domains that imply a more active and dynamic use of time. These aspects

are revealed, also in our survey, by the lower importance assigned by male users to the monetary cost of transport.

Similarly, an overall higher cultural level, be it the outcome of an autonomous societal trend or of policies not directly related to transportation, and – even more specifically – a growing awareness amongst people of issues related to environmental sustainability, push towards reduced importance given to the out-of-pocket component compared to the overall (direct and external) cost.

In this context, most policy guidelines should consider this trend by easing the aspects of comfort improvement rather than by targeting merely the speed and/or the cost-effectiveness of transport. Regarding urban public transport, this should push the search for solutions involving modes, vehicles and service organisation that give priority to comfort rather than other aspects of efficiency and effectiveness (of course, this should under no circumstances justify any possible waste of resources). As regards private transportation, special effort should be made through policies that enhance and promote pedestrian mobility, particularly through specific attention to the pleasure and safety of walking (pedestrian areas, management of crossroads/junctions, covered walkways, and street furniture), and through a greater attention to urban design and land use, so that average distances from origin to destination are eventually reduced to ranges suitable for elderly people. Furthermore, in the long term, the benefits arising from such policies would positively affect not only the costs of urban mobility but also those related to healthcare.

3.2. Research Agenda

A possible interesting future research area concerns the particular impact of Covid-19 on the urban mobility of the elderly. As stated by Basu and Ferreira (2021), COVID-19 has generated a fear of infection that leads to shunning mass transit. Consequently, there is a probable increased usage of alternative modes, particularly private cars, and older drivers, especially aged over 75, are suffering from increasing "navigational" problems particularly when travelling through unfamiliar areas (Burlando *et al.*, 2021). In addition to the increase in car use, pandemic fears related to mass mobility are causing increases in the use of micro-mobility modes (Bergantino *et al.*, 2021; Hosseinzadeh and Kluger, 2021). In both cases, the elderly population is likely to be marginalised by a model of travel that relies more on the use of cars or the use of new means of mobility that require greater technological expertise (sharing, apps, smartphones, etc.) or special physical skills (use of segways, kick scooters, electric bikes, etc.) This analysis, however, should be conducted when the post-pandemic phase has consolidated and mobility patterns have stabilised. It is clear that the pandemic has serious repercussions on the mobility of the elderly. Nonetheless, what is important is whether there will be an effective and lasting change in the pattern of

movement of seniors once the fear linked to the virus is left behind. Lifestyle-related urban mobility has moments of disruption that are linked to particular changes in the lives of individuals (Van Acker *et al.*, 2016). The pandemic has been an immensely significant event and it is necessary to understand whether it will determine a deep and stable change in mobility patterns. To do this it will be necessary to wait until the post-pandemic phase is also over.

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URBAN REGENERATION AND URBAN RESILIENCE PLANNING THROUGH CONNECTIVITY: THE IMPORTANCE OF THIS PRINCIPLE OF NEW URBANISM

Abstract. Urban regeneration, which is increasingly having to include methods of adapting urban areas to escalating climate change, is one of the main challenges for the contemporary development of European cities, especially in densely built-up central areas. This multi-level process requires major financial outlays, which is why it is so important to identify the factors that ensure the effectiveness of implemented projects. This article attempts to define the meaning of the New Urbanism principle of connectivity, ensuring freedom of movement in the urban regeneration process. The conducted research has been intended to verify the hypothesis that improving connectivity is critical for the success of the processes of regenerating and improving resilience in degraded urban fabric. The research was conducted using the area regeneration of the centre of Lodz as an example, being the largest project of this type in Poland. The analyses were made by comparing the current status, based on an inventory of the existing situation, and the planned status on the basis of design documentation. The research demonstrates that increasing connectivity will improve the accessibility of properties located within municipal quarters and will help obtain more attractive public spaces. The planned activities will also help bolster climate change in the location by increasing green areas, improving the use of wasteland, and by developing a network of green infrastructure. The execution of the revitalisation project in the centre of Lodz will not only improve the quality of space, but will also increase the resilience of the intensively urbanised inner-city areas to climate change.
Key words: Lodz, New Urbanism, resilience, urban regeneration.

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1. INTRODUCTION

The article evaluates how a set of projects can potentially increase connectivity in the city of Lodz. The concept of connectivity is largely related to the structure of the network of streets in an area, being one of the basic principles of New Urbanism. Increasingly, extreme weather phenomena and their consequences are forcing all of us to work from a multidimensional perspective in the management of urban resources. The efficiency of urban land use is one of the bases for building urban resilience. In the centre of Lodz, efficiency can be improved by, among other things, reducing the area of undeveloped or unused plots. This article describes a project aimed at effectively improving the accessibility and connectivity of areas located in the middle of large quarters. There are many ways of analysing connectivity, the methods presented in the article demonstrate the real possibility of evaluating this variable in the context of actual data from a project in Poland.

2. THEORETICAL FRAMEWORK

2.1. Relevance of the topic

Changes in historic city centres always affect multiple aspects simultaneously and it is clear that revitalising existing valuable resources is not simply a matter of implementing selected architectural forms or following urban trends. Such activities should also include increasing the resilience of urban areas to climate change. This research shows the relationship between the currently implemented city centre revitalisation project in Lodz and the rules of New Urbanism, presenting the effects of the planned changes on urban resilience in the city centre.

Urban regeneration and resilience are among the main challenges of contemporary urban planning. Urban regeneration projects consist of measures aimed at improving the spatial, social, and economic aspects of the quality of life. Many European towns and cities are implementing urban regeneration projects that introduce dynamic and intense changes to their centres (Stryjakiewicz *et al.*, 2018; Majewska and Denis, 2020). Urban regeneration is a long-term and complex process that requires substantial funding and cooperation between many parties: the local authorities, local businesses, and residents. Therefore, it is important to know which factors ensure the maximum effectiveness of urban regeneration projects and enable towns and cities to be transformed in the most cost-effective manner. Here we must highlight the importance of urban resilience planning, understood not only as the ability to adapt to new conditions (Hudson, 2010), but

also the ability to anticipate changes and to respond to them efficiently (Foster, 2007; Meerow, Newell, Stults, 2016; Desouza and Flanery, 2013). This is especially true in post-industrial cities such as Lodz, where wastelands are intertwined with valuable urban fabric building the city's identity (Kaczmarek, 2011). In such cities, it is important to improve the accessibility of wastelands and encourage their reuse in a productive way. Improving the connectivity and accessibility of city centre areas influences the elements enhancing the resilience of a city – increasing the efficiency of links, preventing fragmentation, improving the efficient use of resources, and reducing inefficiencies in urban areas by diversifying traffic flows (Drobniak, 2014).

Improving the quality of life in city centres decreases the outflow of residents to suburbs. Researchers indicate that New Urbanism (NU) includes frameworks and guidelines addressing the problems of urban sprawl (Dixon and Dupuis, 2003; Bohl, 2000; Moore and Trudeau, 2020). Specific urban design principles originating from traditional planning concepts (Duany and Plater-Zyberk, 1992, 1994) can today provide guidance on how a degraded city can develop again towards its centre – urban infill development (Katz, 1994; Cysek-Pawlak and Pabich, 2020; Cysek-Pawlak and Krzysztofik, 2018). Connectivity is identified as one of the basic principles of NU.

This article attempts to define the meaning of the New Urbanism (NU) principle concerning connectivity in the urban regeneration process. The conducted research has been intended to verify the hypothesis that improving connectivity is critical for the successful implementation of the processes of regenerating the degraded urban fabric of the city centre. The following important aspects were considered in particular: improving pedestrian accessibility, making public spaces more attractive, and increasing the possibility of complementing the existing building structure with new investments. These elements are important from the point of view of both residents and other users of the area, as well as investors. A detailed description of the determinants of improving connectivity in the context of the examined areas is included later in the article.

2.2. Connectivity and New Urbanism

The theoretical framework of the research is the basic document of New Urbanism – the New Urbanism Charter (Calthorpe, 1993; Katz, 1994). The charter indicates those urban strategies that promote environmental and sustainable social development. New urbanist design principles have become a means of developing a sense of community by facilitating social interaction through interconnected streets and open spaces, the diversity of uses, and local architecture. The Congress for New Urbanism states that "Many activities of daily life should occur within walking distance, allowing independence to those who

do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy" (CNU, 2000). NU studies the needs of pedestrians and considers the diversity of the various conditioning of social groups, example.g., in terms of the levels of income, age, disability, gender, cultural diversity, etc. (Alfonzo, 2005; Talen, 2019; Girling *et al.*, 2019; Aghaabbasi *et al.*, 2019; Carpio-Pinedo *et al.*, 2019; Dutton, 2000). In this way, New Urbanism has become a method of improving connectivity in inner cities (Bohl, 2000).

The principle of connectivity is significant among the NU guidance (Bocarejo, 2012; Preisner, 2007; Litman 2012). The key protagonists of the examined urban movement, Duany and Plater-Zyberk (1994), have argued that a network of interconnected streets determines neighbourhood structures building sites and traffic. As contemporary researchers have stressed, over the last two decades, street network connectivity has gained widespread acceptance as a key consideration of walkable urban places (Southworth and Ben-Joseph, 1997; Paterson and Butler, 2003; Marshall and Garrick, 2010; Bern and Marshall, 2013). The possibility of pedestrian travel, which is conducive to public health and urban vitality, is closely connected with other NU principles such as the land use mix and ensuring better access to basic services (Carpio-Pinedo *et al.*, 2021). Connectivity correlates directly with transportation choices and maximising land use (Levine, 1998; Talen, 2002). In the context of urban patterns modelled on new urbanist principles, it also translates into reduced travel time and increased accessibility (Cervero and Gorham, 1995). This is particularly important for often repeated routes, example.g., between the place of work and the place of residence (Talen, 2000). In the literature of the subject assessment, attempts have already been made to study the relationship between travel behaviour and new urbanist structures (Joh *et al.*, 2008; Khattak and Rodriguez, 2005; Nasar, 2003). However, none of the existing research has presented the issue of connectivity in correlation to the urban regeneration process. In this article, we assume the definition of connectivity within its NU meaning, understood as the integration of interconnected networks of streets and open spaces (Jackson, 2018).

2.3. Relationships between urban resilience and connectivity

Defining the efficiency of using resources, including the efficient use of urban land, should be seen as one of the basic elements of building urban resilience (UN-HABITAT, 2017; the European Commission and the European Environment Agency, 2022). Lodz has many of the characteristic of post-industrial cities, contributing to its low resilience. These include large areas of wasteland, including in the centre, a low density of pedestrian connections, a large number

of spatial barriers, de-urbanisation, and the polarisation of living conditions and space quality depending on the place of residence (Drobniak, 2014; Kaczmarek 2001; Warzywoda-Kruszyńska and Jankowski, 2013). A challenge for improvement here is also the low efficiency of land use in the centre – in Lodz, plots located in the middle of quarters are often wasted due to a lack of transport access. This results in a low intensity of development and relatively large areas of wasteland at the heart of the city. A more efficient use of urbanised areas is one of the challenges defined in the city's policy (Adaptation Plan..., 2018). New pedestrian links should serve to increase the amount of pedestrian travel in the centre. At the same time, revitalisation projects for Lodz' city centre introduce solutions that should contribute to reducing the intensity of car traffic in the city in favour of more people using bicycles and public transport. Such solutions include cycle lanes and pedestrian/cycle paths, giving priority to public transport, limiting the speed in the city centre by introducing 30 km/h zones, and reducing the number of parking spaces. The research attempts to assess the impact of measures for improving connectivity on the effects of regeneration and resilience.

3. METHODS, BACKGROUND AND SUBJECT OF RESEARCH

3.1. Research methods

Various methods have already been tested in connectivity studies, with the connectivity index, intersection density, and street density being the most popular (Knight and Marshall, 2015; Straatemeier and Bertolini, 2020), but also involving connectivity metrics based on graph theory (Marshall, 2005; Peponis *et al.*, 2007). In order to better understand street network connectivity, the index of increasing accessibility to urban function is also used, by checking the number of functions available within certain zones (Moseley *et al.*, 2013). GIS containing complex characteristics of urban tissue is another commonly used tool (Higgs, Fry and Langford, 2012). This methodology is based on specifying the distance of potential users from characteristic urban points (such as a park) (La Rosa, 2014). Research on pedestrian access for quantifying the urban quality enabled researchers to establish an acceptable walking distance (Song and Knaap, 2004; Knaap *et al.*, 2005; Yang and Diez-Roux, 2012; Millward *et al.*, 2013).

In response to existing metrics and the specific context of regenerated urban tissue, in the presented research we developed our own method based on four indicators. The first analysis concentrates on the changes in the spatial network density index by calculating the ratio of the length of the connections to the

area. This index is often used in research on networks of spatial links, similar to those already mentioned: the connectivity index, intersection density, and street density. It enables researchers to estimate the scale of spatial changes within the examined scope. The second involves analysing changes in pedestrian access to three types of facilities: public transport stops, city parks, and primary schools. Here, we compared the length of access before and after the spatial changes. The literature describes research into the availability of basic services, but this kind of research tends to have been conducted in order to confirm whether the availability of services is sufficient or not for residents (e.g., schools and parks – Talen, 2002), or to investigate the influence of actual distances on real property prices (Song and Knaap, 2004). The same research may be used to identify the location of new residential projects that can be served by the existing services. Our study does not concern only the location of services, but applies to a larger scale. The purpose is to specify the effectiveness of new links, namely whether new crossings really facilitate access to services and encourage walking, and whether they help increase quality of life. Daily services were selected that should be accessible within five minutes walking distance. However, where not all of them are within acceptable walking distance, the need to shorten the distance is justified. In addition, an analysis of accessibility to attractive public spaces was also conducted. This indicator is defined as changes in the size of green areas. This indicator answers a serious problem for the residents of Lodz city centre, namely no access to green areas. This is particularly important due to climate change (for instance, it helps prevent the creation of heat islands) and builds urban resilience. The improvement of investment opportunities in the areas neighbouring the designed connectivity is another analysed indicator. This indicator stems from the specific nature of the spatial structure in Lodz, with its many unmanaged areas, especially inside large quarters (described further in the article). Since facilitating access to such areas is one of the objectives of constructing new crossings, it is reasonable to check whether they have the intended effect.

The research was performed using quantitative and statistical methods. Statistical surveys show the differences between the length of existing and new connections in city blocks, and quantitative surveys show changes in the accessibility of public transport, green areas and schools. Research of an empirical nature was also used, leading to pragmatic conclusions that can be used in practice. This is an analysis of the assumptions of the local law and the impact of potential changes that have been allowed in the legal provisions in the examined areas on space. Quantitative research was also used here, in the form of collecting and collating area indicators using several techniques: site surveys, documentary analysis, and the compilation of databases. All the indicators were presented by a description of case studies – changes in the accessibility of revitalised areas in eight areas in the centre of Lodz were indicated. Descriptive analyses and a comparative analysis

of the materials obtained from analysing the current status and the project documentation were conducted when compiling the studied cases. By concentrating on the four described indicators we have attempted to develop an innovative methodology of assessing the revitalisation results in line with the principles of New Urbanism and urban resilience. Even though they were applied for the purposes of this article in a specific case study, we can see the possibility of developing the method and applying it in comparative studies.

3.2. Local conditions

Lodz is the third-largest Polish city in terms of population (682,679 residents in 2019, according to Statistics Poland). In the second half of the 19th and the early 20th centuries, the city underwent intensive development linked to the industry. It used to be a city dominated by the textile industry, with an unprecedented rate of development, but has been struggling with the problems of a post-industrial city for several decades, suffering particularly from deurbanisation and depopulation. The city structure mirrors its history. Lodz' city centre is characterised by a mixed spatial structure, consisting primarily of compact tenement and post-industrial buildings that have been heavily spoiled. As a result, the number of vacant and undeveloped plots of land is increasing in the "unfinished" spatial structure of the city centre. Another important feature of Lodz' city centre is the large size of city blocks, most of which are between 3 and 10 hectares in size, and where post-industrial buildings are predominant – even exceeding 20 hectares. These block sizes are significantly larger than in other 19th century European city structures and that results in major constraints on spatial connectivity and mobility. The quantity and quality of public spaces, especially public squares and green areas, is also insufficient. At the same time, it is an area with a large stock of cultural assets and is crucial to the identity of Lodz. It is also the heart of urban life, with important service, administrative, cultural, and transportation functions.

3.3. Objectives and scope of regeneration and investment activities in Lodz' city centre

In order to stop the progressive degradation of Lodz' city centre, to bring it out of crisis, and protect and utilise its preserved assets, it is necessary to conduct a regeneration process. In a broader perspective, such an approach will contribute to improving quality of life and use of the city centre which may result in its revival and the transition of Lodz into the reurbanisation phase. Activities related to the renewal of the city centre have been conducted for a long time, but have only actually gained real momentum after the introduction of new legal regulations in Poland in the form of the Revitalisation Act of 2015 and upon the prospects of

attracting significant funding from the European Union. In 2016, a resolution was passed including the entire city centre of Lodz in what is known as a revitalisation zone and a degraded zone (Resolution No. XXV/589/16, 2016). It covers an area of 1,783 ha, which accounts for 6.1% of the city (Fig. 1a).

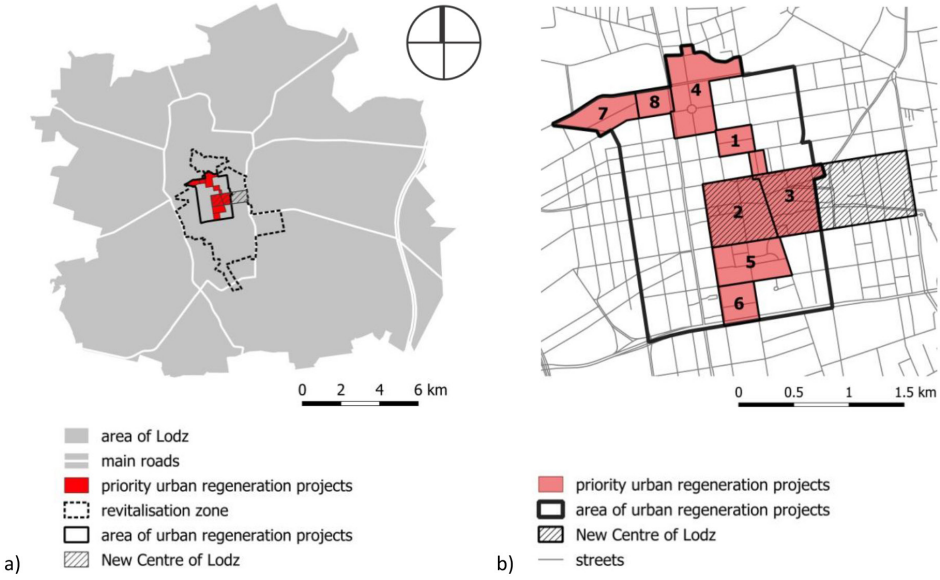

Fig. 1. The location of the priority urban regeneration projects

Source: own work using data from the Head Office of Geodesy and Cartography (GUGiK).

Due to the size of the zone and given the widespread needs, eight areas have been identified for priority action (numbered 1 through 8). They cover 164 ha, which is 9.2% of the revitalisation zone (Fig. 1b). Public investments conducted as part of Lodz City Centre Urban Regeneration Programme concentrate on these eight areas. Urban regeneration projects include: the reconstruction of the transport system, the renovation of parks and public squares, the construction of pocket parks, and the renovation of tenement houses. Among these tasks, priority is given to projects involving the introduction of public spaces to the currently unavailable interiors of city blocks. They include the construction of new streets, passages, and mixed-use paths. The constructed public spaces are intended to improve connectivity and encourage pedestrian and cyclist traffic, but also to provide residents with access to attractive places of high utility and visual quality.

In addition to urban regeneration measures, the investment programmes have also been designed to renovate the city centre. The New Centre of Lodz

(NCL) is an area subject to intensive reconstruction. This area of 100 ha is located around a railway station and a bus station. The location of the rebuilt railway line underground has freed up significant land for investment. New office and residential buildings and a system of public spaces have been constructed around the station.

Projects involving spatial changes in urban areas, including regeneration projects, must be implemented with urban resilience planning in mind in order to ensure that the effects will be visible in the long term. Adapting cities to climate change is one of the main objectives of European policy. The new EU Strategy on Adaptation to Climate Change emphasises that there is a need to increase the resilience of our cities in response to climate change. In 2013, Poland adopted the Strategic Adaptation Plan for sectors and areas vulnerable to climate change until 2020, with an outlook to 2030. The Climate Change Adaptation Plan for Lodz was adopted in 2018. It indicates that areas of intensive housing blocks, including densely built-up inner-city quarters, are particularly vulnerable to climate change. Improving the quality of life in the city centre was defined as one of the main challenges of the local urban policy.

3.4. Research area and subject matter

The research concentrates on the eight priority projects of the Lodz City Centre Urban Regeneration Programme. The analysis concentrated on projects currently being implemented that improve connectivity. Due to the fact that Area No. 2 and most of Area No. 3 of the regeneration are also covered by the NCL scheme, we included measures implemented in that scheme in the research. The projects analysed in detail mainly include public measures involving the construction of new streets, passages, mixed use paths, and public squares. Special cases that we have considered are the reconstruction of the existing passage (Pasaż Schillera) in Area No. 5 and the construction of a mixed-use path with an underground street (ul. Hasa) in Area No. 3. In the latter area, a private investment involving the construction of a passage between two office buildings (known as Brama Miasta or the City Gate) was also included in the analysed cases. Construction work for individual tasks is at various stages of execution or is still to be commenced, but they should all be completed by the end of 2022 (Lodz City Centre Urban Regeneration Programme). Fig. 2 presents the new projects improving connectivity.

The research conducted in the areas of eight priority regeneration projects in the inner city of Lodz made it possible to assess the impact of improving connectivity. The benefits achievable through this include improved pedestrian accessibility, increased attractiveness of public spaces, and the activation of areas along the newly constructed connections.

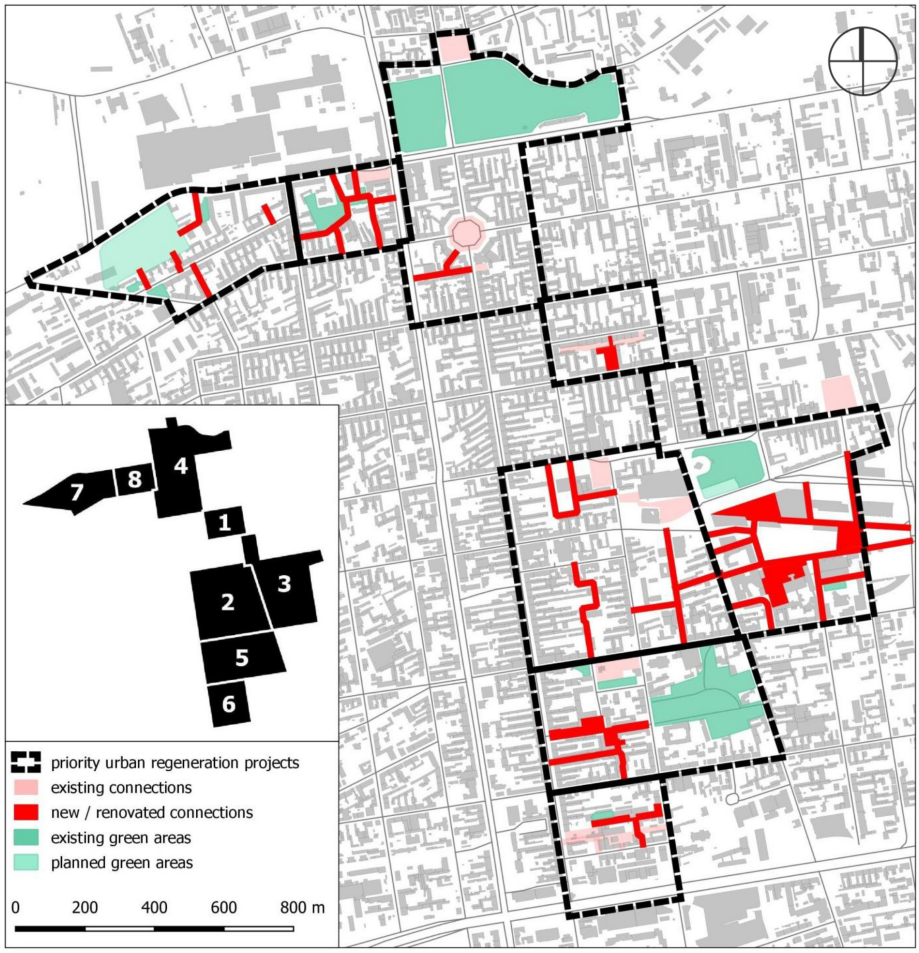

Fig. 2. Undertakings improving connectivity subject to the research

Source: own work using data from the Lodz Geodesy Centre (ŁOG) and the Head Office of Geodesy and Cartography (GUGiK).

4. RESULTS

4.1. Improvement of connectivity

The study of the improvement of connectivity was based on the calculation of the connections' network density index, i.e., the ratio of their length to the analysed area. The area measurement omits city blocks where city parks are located as none

of the researched projects are executed there. The indicator was calculated for the state before and after the introduction of the new connections. The change in the indicator for each area is presented in percentage increments. The survey shows that connectivity has improved in every project (Table 1).

Table 1. The indicators of connections density

Regeneration area	Existing connections [m]	New connections [m]	Area [ha]	Connectivity Density Indicator		
				Status before [m/ha]	Status after [m/ha]	Indicator Change
Project 1	1699	83	7.28	233	245	+ 5%
Project 2	4102	1444	31.60	130	176	+ 35%
Project 3	2321	1932	22.18	105	192	+ 83%
Project 4	2622	260	16.52	159	174	+ 9%
Project 5	2158	364	11.00	196	229	+ 17%
Project 6	1997	301	9.83	203	234	+ 15%
Project 7	1813	249	10.32	176	200	+ 14%
Project 8	1070	760	7.03	152	260	+ 71%

Source: own work.

Before the regeneration projects were commenced, the density of the network of connections was the weakest in large city blocks, as well as in blocks with building structures other than the typical tenement buildings in the city centre. Area No. 3 stands out here, still dominated by railway infrastructure and industry at the beginning of the second decade of the 21st century, with the largest city block of 26.5 ha. The highest value of the indicator was obtained in areas where investments had already been made to facilitate access to real properties or movement through the interior of city blocks. For example, in Area No. 1, the street running through the middle (ul. Włókiennicza) has been designed secondary to the original urban layout, dividing the large city block into two smaller ones. In addition, as part of the restructuring of the historical buildings, the outbuildings were demolished and an additional street was placed at the back of the street frontage. Similarly, in Area No. 6, apart from the secondary street (ul. Roosevelta), the space of the former industrial estate (known as Off Piotrkowska) was developed and made public by a private investor.

The greatest improvement in the network of connections occurred in the areas that originally had the lowest indicators (Areas No. 2, 3, and 8). In Area No. 3, the significant development of the network of connectivity is associated with a change in function and land use. As part of the NCL scheme implemented there,

developments are being executed in the post-railway areas that have been freed up by placing the railway line underground, as well as post-industrial areas, including the buildings of the first Lodz power plant, adapted for cultural purposes. Ongoing and planned building investments are accompanied by the construction of a system of public spaces, including streets, pedestrian passages, and mixed-use paths, as well as three public squares. In addition, the underground street under construction will provide direct access to the parking areas located beneath the buildings, freeing the ground level from vehicle traffic. The developments in Area No. 2 include new streets dividing three large city blocks (between 5 and 8 ha), while in Area No. 8, a system of pedestrian routes and pedestrianised courtyards is being implemented to allow movement within the block, providing easier access to a church, with its garden and nursery school located there.

4.2. Improving pedestrian access

Improvements to pedestrian accessibility were examined using three types of facilities as examples of targets of daily walking trips by residents of the analysed areas. These include public transport stops, city parks, and primary schools. In the case of public transport stops, access to the stops along a chosen tram or bus line was examined. The centre of Lodz is the part of the city best served by public transport. As calculated, the access range to a public transport stop with a radius of 250 m covers 98% of the analysed areas. It can, therefore, be concluded that almost the entire area is within acceptable walking distance of up to five minutes, so there is no particular need to shorten walking routes to the nearest public transport stop. In this situation, the stops of a selected line became a more reasonable object of study. As regards city parks, in addition to the existing ones, the planned park in Area No. 7 has also been included.

Table 2. Indicators of improved pedestrian accessibility to public transport stops, parks and primary schools

Regeneration area	Analysed access target	Length of walking distance [m]		Indicator [m / 100 m of connection]
		Status before	Status after	
Project 1	public transport stop	461	461	0
	city park	662	662	0
	primary school	456	456	0
Project 2	public transport stop	603	472	9
	city park	686	550	9
	primary school	900	900	0

Regeneration area	Analysed access target	Length of walking distance [m]		Indicator [m / 100 m of connection]
		Status before	Status after	
Project 3	public transport stop	710	530	9
	city park	361	361	0
	primary school	581	581	0
Project 4	public transport stop	676	594	32
	city park	582	582	0
	primary school	645	645	0
Project 5	public transport stop	482	482	0
	city park	449	449	0
	primary school	508	508	0
Project 6	public transport stop	408	429	0
	city park	716	737	0
	primary school	459	459	0
Project 7	public transport stop	553	384	68
	city park	528	487	16
	primary school	743	671	29
Project 8	public transport stop	489	427	8
	city park	585	515	9
	primary school	676	681	0

Source: own work.

In order to conduct the study in each area, a residential building was selected with the longest distance to the access target. The access distance was then measured before and after the introduction of the new connections. Based on the measurements, the indicator was calculated showing by how many metres the distance would be shortened per 100 m of new connection (Table 2). The measured connections, studied residential buildings, and access targets were illustrated using Areas No. 7 and 8 as examples (Fig. 3).

The research indicates that the construction of new connections will have a limited effect on improving pedestrian access. Walking distances were shortened in one-third of the examined cases. The projects implemented in Area No. 7 were the most effective in terms of the analysed issue. They enable a shorter walking distance to each of the examined targets. In addition, differences in walking distances give the highest values using the ratio per 100 m of constructed connection. In four areas (No. 2, 3, 4, and 8), the walking distance to public transport stops is shorter, as is the distance to the city parks in two of them. Connections constructed in other three areas (No. 1, 5, and 6) do not offer any advantage in terms of improving access for pedestrians.

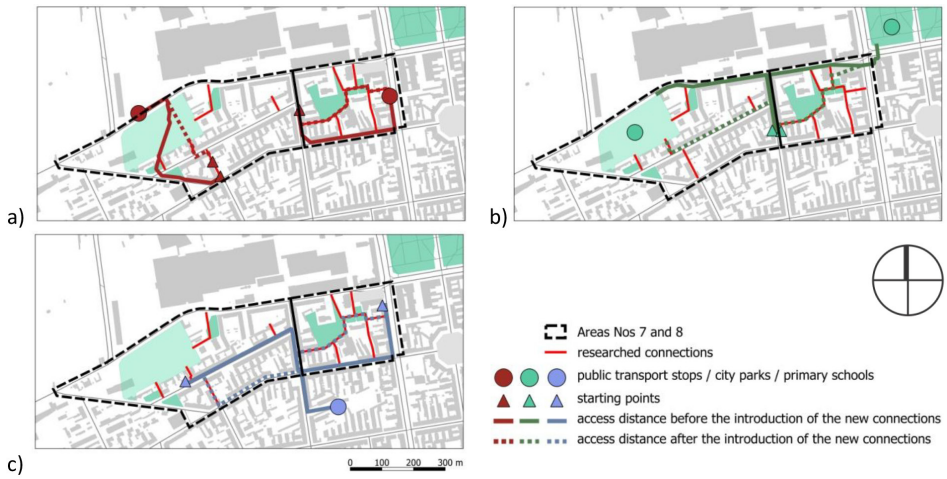

Fig. 3. Study on improving pedestrian accessibility to: (a) public transport stops, (b) city parks, and (c) primary schools, using Areas No. 7 and 8 as examples

Source: own work using data from the Lodz Geodesy Centre (ŁOG) and from the Head Office of Geodesy and Cartography (GUGiK).

The analysis of the study's results has revealed a number of factors that facilitate pedestrian links by dint of the introduction of newly constructed connections. The best results can be achieved provided that the following conditions are met:

– connections should be constructed near potential access targets,

– constructing connections parallel to existing streets and meandering between existing buildings should be avoided,

– a system of connections linking adjacent city blocks should be created,

– alternative exits should be enabled from real properties directly next to the connections.

Clearly, these conditions are sometimes impossible to be met or would require extremely high financial outlays, meaning that shortening the walking distance often fails to be the priority. In Lodz' city centre, optimising the geometry of connections is a challenge due to certain local conditions, e.g., the prevailing orthogonal grid layout of streets and plot boundaries, the dense existing development, and the diverse forms of property ownership.

4.3. Analysis of accessibility of attractive public spaces

A shortage of green areas is observed in Lodz' city centre. There are not enough parks, while the streets and squares are most often deprived of greenery. The urban regeneration activities are aimed at improving this situation. Streets are being re-

constructed with new trees and shrubs being planted. However, due to the limited width of the streets and the city's traffic and parking needs, their recreational function is limited. Therefore, for the purpose of this study, we have assumed that the attractiveness of the analysed connections may be best expressed in the designed green areas. Green areas introduced inside city blocks and ensuring easy access to local residents may compensate for the lack of close access to a city park.

Over 80% of the analysed projects have green areas of various forms: trees and shrubs planted along streets or pedestrian passages, garden squares, green courtyards, and public plazas. Nearly 90% of the designed green areas are suitable for recreational purposes by dint of their layout and street furniture, benches at the minimum. Playgrounds or landscaping elements typical of parks or gardens, such as pergolas, gazebos, fountains or drinking fountains, are also often designed. The planned plantings are of various types. They include various species of trees, shrubs, perennials, grass, flowers, and climbing plants. In addition, inside city blocks there are areas developed with greenery but currently available only to a limited number of users, for instance the church garden and the green square next to the nursery school in Area No. 8. The introduction of intra-block connections enabled these areas to be used and incorporated into public spaces, if not physically then at least visually as the green space by the church and nursery school will be fenced.

Plans for new connections (ZIM) were used to conduct the study. On the basis of these plans, the designed green areas were determined and measured. In addition, on the basis of an up-to-date orthophoto (ŁOG), the existing green areas that through the implementation of the projects will be made available to residents physically or visually have been identified and measured. An indicator corresponding to green areas per 100 m of new connection was then calculated (Table 3.).

Table 3. Green areas and indicators in the analysed connections

Regeneration area	Green areas [sq. m]		Indicator [sq. m / 100 m of connection]
	existing	planned	
Project 1	–	765	922
Project 2	638	2,338	206
Project 3	1,616	5,243	355
Project 4	–	1,114	428
Project 5	–	2,432	668
Project 6	–	2,431	808
Project 7	–	2,537	1,019
Project 8	8,031	2,434	1,377

Source: own work.

The best results were achieved in an area with a significant proportion of existing greenery in the interior of a city block (Area No. 8). Planned greenery produced the best results in Areas No. 1 and 7. Area No. 1 has Pasaż Majewskiego, a major section of which will constitute a square with greenery, a playground, benches, and fountains (Fig. 4). In Area No. 7, a large green square is planned along one of the routes, while the short lengths of new connections help bring high efficiency. The worst results were found in areas where the public spaces are dedicated more for transport and access purposes (Areas No. 2 and 3). This is despite the presence of existing small green spaces and the largest single area of new green space in Area No. 3. The results of the study in the latter area seem to be confirmed by the already executed public spaces, created during the construction of the new railway station and the reconstruction of the former power plant. The lack of greenery is noticeable there and has been highlighted in negative feedback from residents.

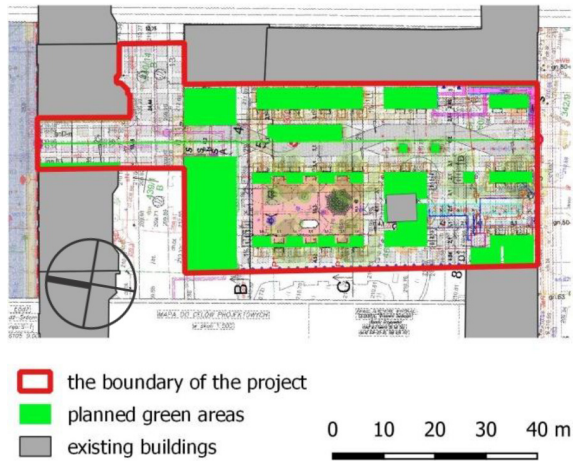

Fig. 4. Planned green areas in Pasaż Majewskiego (Area No. 1)

Source: own work based on a project provided by the Municipal Board of Investment in Lodz (ZIM).

4.4. Improving investment opportunities in neighbouring areas

The construction of connections inside city blocks will facilitate new investments in the areas directly adjacent to them. Such areas often lack proper access services or are developed and used extensively as back-up areas to building plots. Buildings located by new connections should face them, for mutual benefit. Public spaces acquire an architectural setting and their users feel safe, while the new buildings gain direct transport services and the ability to introduce functions requiring public

access, e.g., commercial services on the ground floor. The possibilities and conditions for locating new buildings are defined in local zoning plans (MPU).

Fig. 5. New investment opportunities with connections in Areas No. 2 and 3

Source: own study using data from the Lodz Geodesy Centre (ŁOG) and from the Head Office of Geodesy and Cartography (GUGiK).

The study of investment opportunities consisted of plotting new buildings that could be constructed along the studied connections on the basis of local zoning plans (Fig. 5) and then measuring their area. The presented indicator expresses the area of development per 100 m of new connection (Table 4).

Table 4. Indicators of new investment areas adjacent to the analysed connections

Regeneration area	New investment area [sq. m]	Indicator [sq. m / 100 m of connection]
Project 1	1,372	**1,653**
Project 2	14,221	**985**
Project 3	15,394	**797**
Project 4	691	**266**
Project 5	1,780	**489**
Project 6	2,384	**792**
Project 7	1,666	**669**
Project 8	4,090	**538**

Source: own work.

The best new investment opportunities are provided by connections constructed in the post-railway and post-industrial areas allocated for new development (Area No. 3). Slightly less investment land can be acquired in city blocks with peripherally located tenement buildings and undeveloped internal areas (Area No. 2). The highest value of the indicator can be seen in Area No. 1 where new investments can be executed on the western side of the constructed passage, in place of a tenement house that is in a bad technical condition. The fewest opportunities for new development, both in terms of area and the indicator, are found in areas with dense tenement structures (Area No. 4). Hence, the existing development, the number of buildings, intensity, and technical condition should be indicated as the main determinant for the formation of investment opportunities at the intra-quarter connections.

5. CONCLUSIONS

One of the ten principles of New Urbanism concerns connectivity understood as an interconnected street grid that helps disperse traffic and encourage walking. Lodz is a city with a particular structure resulting from its history as the centre of the textile industry. The low density of the street grid means that areas in the middle of city blocks cannot be put to good use because they are usually not accessible. It is also a structure that is not friendly to pedestrians – excessive distances between intersections do not encourage walking and are not conducive to traffic dispersal. Major changes in this area include the city centre regeneration projects that are currently being implemented. As part of the implemented changes, new pedestrian or mixed-use paths are to be created through previously inaccessible large inner-city blocks. This solution is intended not only to ensure the accessibility of the existing wasteland in the city centre, but also to contribute to a new pedestrian-friendly network of paths and small boulevards. The densification of the communication network will not only improve connectivity, but will also ensure the creation of high-quality public spaces with improved resilience to climate change. The creation of the planned routes, with lots of greenery and street furniture, will not only contribute to an increase in the numbers of pedestrians and cyclists, but will also help reduce the inefficiencies of the transport system, improve connectivity, reduce the unsuitability of urban wastelands for new functions, and increase the amount of publicly accessible green areas.

The basic recommendations for the case of Lodz are, therefore, to implement the New Urbanism principles within the urban tissue. Connectivity, being one of the main principles of NU, is one of the necessary elements proving that regeneration results were successful. This was examined using the example of projects

for the regeneration of the centre of Lodz. The changes introduced in terms of connectivity and accessibility were examined by calculating the indicator of the density of connections in the priority areas for urban regeneration in the centre. In each of the eight areas, the connectivity rates increased, with differences ranging from 5% to 83%. Walking distances to public transport stops, city parks, and primary schools were analysed in detail. The densification of the pedestrian route network will reduce walking distances in approximately 30% of cases. Another indicator examined was the improvement of the accessibility of attractive public spaces. The projects envisage the creation of new green spaces in 80% of the developments, 90% of which will be recreational. Another study analysed changes in investment opportunities. According to the calculations, densifying the access network and ensuring accessibility for plots in the middle of city blocks will generate new development sites in each area that could not be developed so far due to a lack of accessibility. In addition to the investments that are the subject of the study, other public tasks, not currently selected for implementation, are also specified in the local zoning plans, which will complete the system of public spaces, strengthen and extend the expected effects of urban regeneration and urban resilience planning in the future. In addition, public tasks are complemented by private initiatives creating one coherent system of connections. Examples of this include conversions of post-industrial development complexes with public spaces or walkways through the courtyards of tenement houses where services are located.

The research has also shown the specific features of the Polish context related to connectivity and urban regeneration, in particular in post-industrial shrinking cities, like in the case of Lodz. The morphology of inner-city quarters is a result of the history of this location. Rows of long and narrow plots of land had been placed in the city centre for future dwellings, which in time transformed into a densely developed agglomeration centre. The spatial structure here is not consistent, it has many deficiencies and contrasts, often related to the spatial policy implemented before the change to the political system, meaning that current activities should aim to be gradually adding to this structure and making it more balanced. For many years, there were no urban planning documents available, as those created under the previous planning system became invalid. This resulted in a chaos when trying to develop many places, including multiple investment decisions within the boundaries of one or more plots of land. It has been detrimental to public spaces for many years, leading to today's investment in these areas through revitalisation projects. The Revitalisation Act (2015) has defined the framework for certain methods of governance of these projects, though implementing the connectivity principle in operational plans is also recommended, despite being insufficiently regulated in the Polish urban planning system.

Studies have shown that the densification of the transport network by constructing additional routes inside the quarters will not only improve connectivity in many respects, but will also provide accessibility to areas that have so far been

blocked from investment. The example of Lodz shows that, when defining the assumptions for area regeneration, it is necessary to consider the good quality of connectivity. Connectivity and accessibility should be among the basic assumptions in regeneration projects aimed at raising the standard of living and improving the quality of space.

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UNIVERSITIES AND SMART SPECIALISATION IN LESS DEVELOPED EUROPEAN REGIONS: AN EVIDENCE-BASED OVERVIEW

Abstract. This paper aims to review the evidence demonstrating the role of universities in the knowledge diffusion function for Smart Specialisation strategies. It is not new if many experts question whether Smart Specialisation will apply equally in all regions, plus the reason that the study of the role of universities in Smart Specialisation still needs much attention. Through this evidence-based literature review, I have identified three main points that support the role of universities for Smart Specialisation in less developed regions of Europe, including resources in regional innovation systems, public sector investment support for RandD, and strong bonds of the Triple Helix actors.
Key words: universities, Smart Specialisation, regional development, less developed region, Europe.

1. INTRODUCTION

Smart Specialisation emerged as a place-based cohesion policy to encourage regions to find their transformation activities according to a region's characteristics, which would encourage the region to have a new, more competitive economic structure. The Smart Specialisation approach focuses on discovering local entrepreneurship and combining it with critical technological discoveries that underpin entrepreneurial activity in the region. This process requires good absorption from local entrepreneurs (Foray *et al.*, 2009; Foray, 2016, 2018). In this case, the

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transfer of knowledge to the industry and business in the process of Smart Specialisation involves several stakeholders in the field of research and innovation, including research institutions at universities and research institutions in local government (Kempton, 2015; Kempton *et al.*, 2013).

Doubts have arisen whether Smart Specialisation could be applied in the same way to obtain the same results in all regions (Hassink and Gong, 2019). Foray (2019) responded to the criticism and stated that Smart Specialisation had never been concluded as being suitable for all types of regions. It is clear that regions are considered, but less developed or structurally weak regions will have difficulty with the entrepreneurial discovery process (EDP), especially in the form of institutional issues.

In contrast, some capabilities need to be possessed by regions to apply Smart Specialisation, namely the ability to diffuse knowledge to support the Smart Specialisation process as producers of local knowledge universities have a very strategic role for the success of Smart Specialisation (González-López *et al.*, 2015; Pavlova and Burenina, 2016). In the European Commission's documentation (2014) by Fotakis *et al.* (2014), public research organisations and universities on the application of S3 are considered core innovation actors. It means that a region should make universities and public research institutes centres of Smart Specialisation (Foray *et al.*, 2012; Kempton, 2015; Kempton *et al.*, 2013; Vallance *et al.*, 2018). Research on the role of universities in implementing Smart Specialisation policies during the 2014–2020 period of Smart Specialisation has not received much attention.

The dynamics of studies and research on Smart Specialisation during the 2014–2020 implementation period continue today. The main issue of emerging barriers in underdeveloped regions is still the concern of several leading academics (i.e., Asheim *et al.*, 2017; Asheim, 2019; Barzotto *et al.*, 2019). The challenges that often arise in the implementation of S3 in various regions often attract the attention of scholars. For example, a paper by Vallance *et al.* (2018) investigates the implications of universities and public research institutions in Smart Specialisation. According to it, the dynamics are very diverse where the role of the university for Smart Specialisation in regional innovation systems needs to be reconfigured, especially in less innovatively developed regions. In a recent study Lilles *et al.* (2020) has examined the capabilities of all EU regions with regional divisions and examined how the potential for university collaboration is well supported and implemented in these regions. This research has shown that potential support for each actor involved in university and industrial collaboration in each region is not homogeneous because each region has its own characteristics. A paper by Papamichail (2019) and Papamichail *et al.* (2019) highlights the problem of weak collaboration between universities and industry in terms of capacity and network. It studied two regions of Greece that were dramatically affected by the Greek economic crisis. The results showed that the implementation of S3 in this area was practically strongly influenced by absorption capacity (knowledge) and network (organisation).

Based on this description, this paper aims to reviews how universities as the house of knowledge play an essential role in the Smart Specialisation process. I compiled several sources that specifically review university and Smart Specialisation strategies in less developed regions of Europe. The structure of the paper in the next section presents a systematic methodology used to conduct this review. In the third section, I review the position and role of universities in the region implementing Smart Specialisation strategies and review how universities relate to key actors in regional innovation systems for Smart Specialisation. In the fourth section, I review evidence of university and industry collaboration for Smart Specialisation in less developed regions of Europe. The paper closes with a discussion of the critical factors that can improve the university's relationship with innovation actors within the framework of Smart Specialisation, and provides policy recommendations and future research.

2. METHODOLOGY

This study begins with a simple bibliometric analysis using available data from the Web of Science and Scopus and analysing the research network using the VOS Viewer software. I apply the keyword "universit* and smart speciali*ation" to get the data and limit only the article document type. I apply the keywords "universit* and smart speciali*ation" to obtain data and limit the type of document to articles only. The use of "*" in keywords is intended so that the same terms but with different spellings, namely universit(y), universit(ies), speciali(z)ation and speciali(s) ation, are expected to appear in the article search process. 29 most relevant articles were successfully exported in this process, and then I compiled and anticipated duplication. Then using the VOS Viewer software, I analyse the network and the density of research in this field.

The results of network analysis show that research related to the university and Smart Specialisation have a fairly close relationship, as shown in Fig. 1. The network distance is quite far, but the term smart specialisation/specialization strategy also appears in this network and is close to each other. I did not limit the year of research, but if I refer to the period since the concept of Smart Specialisation was introduced by Foray *et al.* (2009), and when its first phase of implementation started in 2014–2020, not much literature studies on Smart Specialisation and universities have been conducted, as shown in Fig. 2. Density Research on this topic is seen in the density network, which is the green part, while the yellow color indicates that much research in this area has been conducted. Therefore, I think that studies related to the university and Smart Specialisations still have enough space for novelty. This review paper is proposed to fill those objectives.

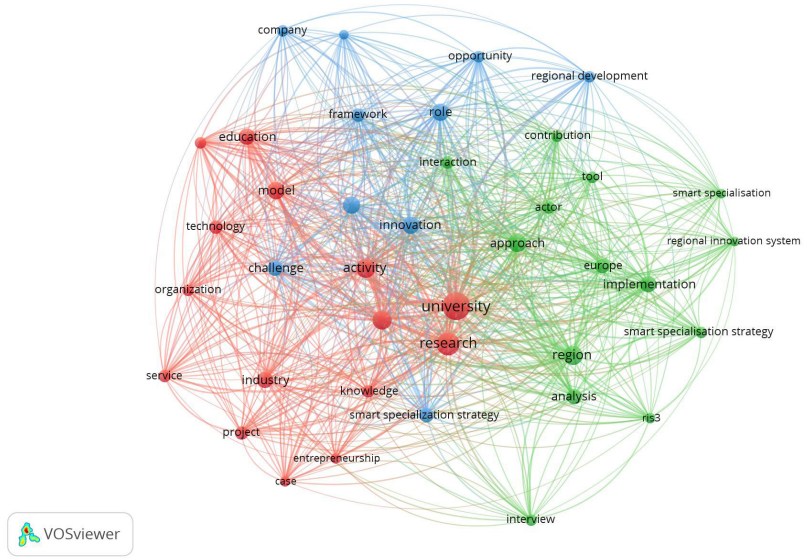

Fig. 1. Network Visualisation

Source: VOSViewer output, own work.

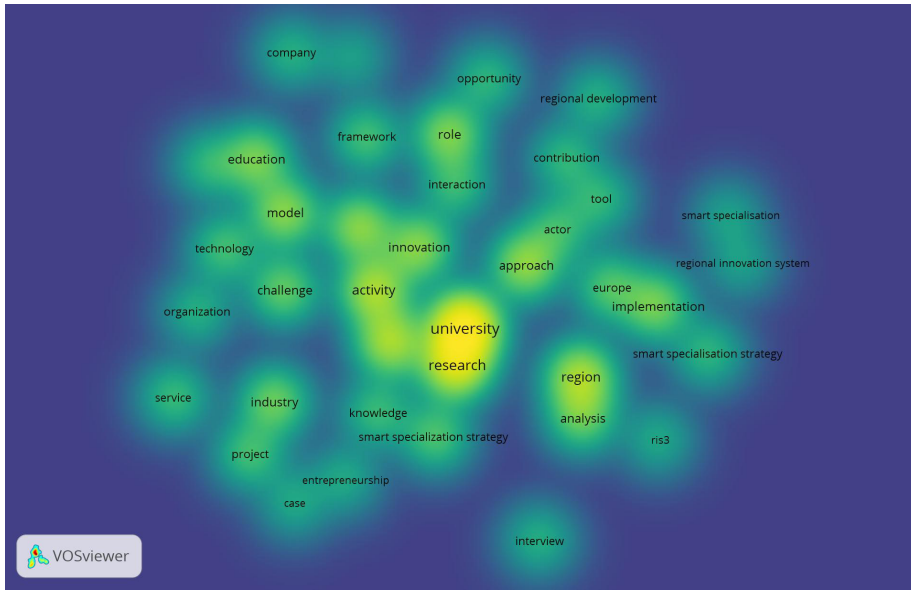

Fig. 2. Density Visualisation

Source: VOSViewer output, own work.

In the next stage, I collected and analysed this collection of articles based on the specific topics discussed, both as theoretical and empirical supports, including university and industry collaboration, university organisations and institutions for Smart Specialisation, knowledge transfer, and university innovation for Smart Specialisation, and implementation of Smart Specialisation involving universities in less developed regions. I was then interested in focusing on implementing Smart Specialisation in less developed regions due to the limitations of this related study in several leading journals. I consider it essential to take a deeper look at the position and role of the university in the context of Smart Specialisation in these regions. The obstacles and challenges that often arise in this region are raised in the discussion section to generate policy recommendations and future research.

3. UNIVERSITY IN SMART SPECIALISATION FRAMEWORK

The effectiveness of the EU's Cohesion Policy that focuses on promoting innovation is not easily realised in less developed regions. This condition is common and is a significant obstacle to economic development in Europe (Landabaso, 1997; Muscio *et al.*, 2015; Oughton *et al.*, 2002; Morgan and Nauwelaers, 1999). The problem of inequality in the innovation system in Europe, according to Capello (2013), appears with regional landscape differences. This inequality has widened since the addition of new EU Member States from Central and Eastern European (CEE) countries, the majority of which inherited innovation systems related to their historical and political backgrounds (Radosevic, 1999; Tchalakov *et al.*, 2010).

The economic structure in this region also influences the capacity to absorb knowledge needed for innovation (Muller *et al.*, 2008; Navarro *et al.*, 2009). This area tends to have a traditional industrial character that learns more from customers' practical experience than from being active in research and development-based activities. Such an industry profile is very influential on the success of innovation in the region (Asheim, 2012; Isaksen and Karlsen, 2010). Despite the many facts that have been demonstrated to show that the less innovatively developed regions are different, the innovation strategy established for the whole of Europe has not specifically facilitated this type of region. There is a demand from European innovation studies that leads to the particular need for innovation policy strategies considering regional differences (Camagni and Capello, 2017; Capello and Lenzi, 2019; Capello and Lenzi, 2016).

The innovation policy originally conceptualised for Smart Specialisation by the Knowledge Experts Group for Growth found common innovation domains across Europe in the regions of basic science and technology such as biotechnology and nanotechnology (Foray, 2017). This group has proposed solutions so that

the regions can find new opportunities for research and innovation in their priority regions which are then used as superior and competitive sectors or sub-sectors through a process they call the Entrepreneurial Discovery Process (EDP) (Foray *et al.*, 2009).

Smart Specialisation can also be described as the concentration of all local resources to transform the regional structure (Foray *et al.*, 2015). According to him, the EDP process requires important actors in the region, such as universities, the private sector, and the government, and the process also requires good governance that connects all these actors. The various links between the region's economic structure and the goal of Smart Specialisation emphasize that the regional structural transformation desired by the Smart Specialisation strategy must clearly consider the region's innovation capability. The role of knowledge institutions, universities in this case, was expressed by Camagni and Capello (2017) and suggests that innovation policies are differentiated for specific regions and based on innovation patterns. One of the classifications has been discussed in applied sciences, where universities and the private sector/industry are considered key actors for the diffusion of knowledge in this science and applied field. Conducted studies have shown that Northern Europe and Central Europe are the concentrations of this classification. Nevertheless, the next question is what about the actual pattern of innovation in European regions.

Foray *et al.* (2015) have described research at universities as not the only centre of Smart Specialisation activities. Smart Specialisation must associate all research and innovation actors. In its dynamics, the company is central in the EDP process, while universities and public research institutions play a less central role in their capacity as research centres. If so, controversy may arise at the level of policymakers. So far, in the experience of less developed regions in particular, universities have played an essential role in the framework of science-based activities, and even development studies conducted by universities have been often used as recommendations in setting regional development policies (Boucher *et al.*, 2003; Huggins and Johnston, 2009). Formally, the central role of universities in EDP is possible but only to mobilise public research funds for development purposes (Foray *et al.*, 2012; Kempton, 2015).

Whatever the university's role for Smart Specialisation may be, its engagement with industry and local government is essential to enhance networking capabilities in regions. The network is also an essential factor in the EDP process. The university is systemically tied to regional innovation. In regions that tend to be lagging with organisational thinness, Smart Specialisation will be strong with the strength of mutual trust between innovation actors (Kempton, 2015). Universities can also play a more significant role in supporting local governance and institutions (Goldstein and Glaser, 2012; Rodrigues *et al.*, 2001; Sotarauta and Kosonen, 2004). Institutional capacity is important for a new policy approach (Grillitsch, 2016). However, in regional innovation discourses, governance and

institutional issues in less developed regions often emerge as obstacles and challenges (McCann and Ortega-Argilés, 2016). In addition, one of the main reasons innovation is less developed in the region is due to the low response of local companies in absorbing local knowledge. Studies conducted by regional research institutions are often not in accordance with the needs of local businesses (Barzotto *et al.*, 2019; Rodríguez-Pose, 2001).

Universities are now contributing in different ways apart from their traditional functions in educational and research activities (Benneworth *et al.*, 2009; Gunasekara, 2006). In the Triple Helix model, the interaction of actors (university-industry-government) is essential for innovation (Etzkowitz, 2003). In the model, the spatial dimensions of the region are considered. It is in accordance with the concept of regional innovation, where it can describe the process of intensive knowledge diffusion. Universities play a role in the knowledge diffusion process, while government and the industry are more involved in knowledge application and policy implementation. To channel knowledge outside an area, the capabilities of these regional actors must be reliable so that the region and the actors within it have advantages and competitiveness (Hashi and Stojčić, 2013; Isabel Maria *et al.*, 2014; Lawson, 2003; Smith *et al.*, 2018).

Interesting studies of Smart Specialisation in less developed regions prove the diversity of innovation systems, innovation performance, and collaboration between universities and industry (Radosevic, 2017; Seppo *et al.*, 2014). This last point requires sufficient intervention from the government as a policymaker. The government should promote university-industry cooperation and increase their engagement to realise the advantages and competitiveness of regional innovation.

4. THE UNIVERSITY AND SMART SPECIALISATION IN LESS-DEVELOPED EUROPEAN REGIONS. REVIEW OF THE EVIDENCE

Vallance *et al.* (2018) conducted a case study research in one of the less developed European regions, namely Łódzkie (Poland). Łódzkie has the characteristics of a less developed region due to a strong historical background in the textile industry for more than two centuries, a fact which has greatly influenced the innovation process in the region. However, there is a fairly high potential for innovation due to sources of knowledge such as higher education institutions – the numbers of academics and students that are quite large and complete, especially those centered in the capital. It makes Łódź one of the cities with the best technology universities in Poland. This study aims to analyse the perspectives of regional stakeholders in examining the role of knowledge institutions involved in the Smart Specialisation process, for example, in terms of organisational capacity

and university and industry collaboration in the EDP process for Smart Specialisation. Interviews were conducted with many actors such as entrepreneurs, actors in regional research institutions, planning agencies, etc.

Vallance *et al.* (2018) have stated that identifying the relationship between knowledge institutions such as universities and public research institutions with companies or industries is very important to achieve recognition of whether the results of the institution's studies and other outputs such as the quality of education and skills of prospective workers meet the expectations of these end users. From the results of the survey and interviews, this satisfaction can be seen in several companies in Łódzkie that think that universities and research results are important for the sustainability of their business. Moreover, bona fide companies such as IT companies in the area formally appoint their company management to conduct special recruitment among university graduates in the region. However, companies also admits that not all levels of education at universities are suitable for their needs. There are recruitment limitations, such as a low demand for Ph.D. graduates to work in the company R&D departments, while the need for diploma and undergraduate graduates was more likely. With this relationship, the university also recognises that the reciprocal relationship between business and academia has become quite dominant in educational activities. Unfortunately, a paradigm emerges that this collaboration is often only motivated by research grants where academics need companies as data sources or research subjects. The bad part is that when a project ends, the collaboration between the two is severed, and a new grant will require a new company profile. In this case, a long-term research program to maintain the relationship between the two can be a fairly good consideration.

The findings of Vallance *et al.* (2018) prior to the case study were in the form of a survey of 150 S3 platform members from 27 EU Member States. The results have shown that research investment is not a priority in less developed regions when compared to investment priorities in education and institutions. In fact, in general, respondents (regional actors) in all types of regions (developed, transitional, and less developed) gave high ratings of the level of research in their area. Less developed regions mostly gave high scores to the level of research, while less than 15% gave high scores to the level of regional innovation. It is in contrast to the assessment of respondents in more developed regions where the level of innovation scores higher than the level of research. The evidence in this field also shows that university involvement is seen to be very high, and there is no significant difference between developed regions (80%) and less developed regions (77%). It shows how a university's role is significant in the S3 process.

Of the six regions of RIS3 policy study (Education, Vocational Training, Research and science, Innovation in companies, Infrastructure investment and Social Innovation), actors in less developed regions gave the highest responses to the field of education, in contrast to developed regions which were more concerned

with Innovation. Some regions in the South saw that investment in research could not simply support regional development, whereas local governments were generally more concerned with this. According to them, vocational education and training could be much more helpful for developing regions in the South.

In conjunction with the RIS3 process, regional actors naturally regard universities as their first innovation partners because core education and research activities are at universities. The RIS3 process essentially emphasizes the role of entrepreneurs, but often the role of entrepreneurs is not maximised in the EDP process. The involvement of entrepreneurs is of low frequency, and the selection is random. However, less developed regions generally focus more on the involvement of key industrial actors in that region rather than involving too many industry actors. Furthermore, leading industry actors are also involved in implementing S3 in the field.

Kempton (2015) conducted a study in the Värmland Region, a suburb in Sweden with a small population (less than 300,000 people) and about 25% of the population living in urban regions. This region has socio-economic problems in education and research due to a relatively small share of the productive-age population and a low involvement of the population in higher education. The Värmland Region's involvement in Smart Specialisation is realised through collaboration with one of Sweden's youngest universities, Karlstad University, and involving business actors from the region's leading industrial clusters. Through a cooperation agreement, this collaboration has developed education and knowledge in the region for more than ten years.

The capacity to absorb knowledge which is common in peripheral regions in Europe (Cohen and Levinthal, 1990), also occurs in Värmland, where SMEs still dominate the industrial structure. To address this problem, the Värmland Region established in 2014 an innovation park which facilitates research and business actors to meet, discuss and provide support. Collaboration is then created through this innovation park, and regional innovation development is maintained by making formal ties through cooperation agreements. Thus, the change of personnel in the institution does not necessarily damage the existing governance of regional Innovation.

In this process the role of the private sector appears to be a vital concern; it participates in supervising the collaboration that is created. They even participated in the process of recruiting ten professors to support organisations and institutions at the university. It is imperative to make this collaboration transparent among all parties involved and accountable in management. Another positive evidence of collaboration in the Värmland Region is an increase by more than twofold in terms of university collaboration with entrepreneurs from the steel industry. It is a testament to how the business environment can absorb knowledge from research results, although specific indicators are still needed to measure this absorption capacity.

The collaboration between the industry and universities in the Värmland Region can influence the study program development at the University of Karlstad

to the masters and doctoral levels. It means that universities can prepare graduates according to the skills required by the labour market in the region. However, when competing globally, universities also face challenges in recruiting university students and staff, and meeting the skills requirements of the local labor market while competing on a global level.

Lilles *et al.* (2020) have mapped all EU Member States with regional divisions at the NUTS 1 or NUTS 2 levels. The results of the study have shown that strong regions such as Baden-Württemberg and Bavaria in Germany or Stockholm and Sydsverige in Sweden have the best support from the private sector. Different things have been indicated in several regions in Romania, Poland, and Spain, which tend to be weak in getting support from the private sector to cooperate with universities. Meanwhile, in terms of support from the public sector, it seems that support in all these regions is more evenly distributed. The northern regions of Europe, such as Sweden and Denmark, and the western regions of Europe, such as the Netherlands, UK, Ireland, and the South of France, have received better support from the public sector. R&D investment in regions (i.e., Utrecht in the Netherlands and Stockholm in Sweden) has great support from the public sector. Highly educated population is more concentrated in these regions and increases the local knowledge absorption capacity. However, the situation is the same for some regions in the central and eastern parts (Romania and Poland) and the south (Italy and Portugal), which receive weaker support from the public sector.

Lilles *et al.* (2020) have seen that the ability to collaborate between industry and universities is very heterogeneous in this European region. The implementation of an S3 emphasising entrepreneurship emerges from the entrepreneur's side so that solid cooperation and mutual trust between universities and entrepreneurs are essential to the flow of all critical technology information. Thus, the industry's knowledge absorption and regional innovation systems function properly. This paper also evaluates how the region (at the NUTS 1 level) supports collaboration between universities and industry. It found the primary key to support university and industry cooperation, namely the strength of the support from the three main actors of Triple Helix. However, the very heterogeneous character of the region has always been a challenge in realising this collaboration. By contrast, insufficient support is seen in much of Central and Eastern Europe and Southern Europe.

The diversity of regional capabilities in supporting industrial cooperation and government-supported universities (in the Triple Helix triangle) is important for implementing Smart Specialisation in less developed regions. Bonaccorsi (2009) has stated that it is not easy to realise the Triple Helix in less developed regions. That is because not all actors' goals are necessarily aligned. Meanwhile, a study conducted by Lilles *et al.* (2020) has shown very little evidence of adequate collaboration in less developed regions due to the weak role of actors in the dynamics of regional collaboration.

5. DISCUSSION AND CONCLUSION

In this paper, I discussed how the role of universities in the knowledge diffusion function plays a strategic role in the policy of Smart Specialisation. The discovery of local entrepreneurship is the first target of Smart Specialisation through EDP. Thus, the ability of local entrepreneurs to absorb critical knowledge and technology from universities significantly affects the successful implementation of Smart Specialisation. It is not new that many scholars have questioned whether Smart Specialisation will apply equally to all regions in terms of setting up the EDP process to its implementation. Therefore, universities as producers of local knowledge are considered core innovation actors in Smart Specialisation. But in fact, the study of the role of universities in Smart Specialisation still needs much attention from scholars.

During the initial period of implementing Smart Specialisation, i.e., 2014–2020, the issue of its challenges in less developed regions continued to arise and did not received a meaningful solution. Likewise, studies on the role of universities for Smart Specialisation in less developed regions still receive a large enough space to be filled as a research novelty. Through this brief literature review method, I re-articulated the evidence for the role of universities in Smart Specialisation in less developed regions of Europe. This paper discussed two focus regions, Łódzkie (Poland) and the Värmland Region (Sweden). However, in the final section, I discussed investigations across Europe that ultimately discovered university relationships in less developed regions.

From the results of this evidence-based review, I identified three main points that support the role of universities for Smart Specialisation. First, resources in regional innovation systems define the role of universities for Smart Specialisation in less developed regions. In this case, the involvement of academics and university students in research becomes crucial. Likewise, when they are already in touch with the job market. Less developed regions generally have a lengthy social background and history in specific industrial fields, as in Łódzkie (Poland). The presence of universities in this city as a producer of skilled labour and a source of knowledge and technology can support the region to apply Smart Specialisation. It is important to identify whether the knowledge outputs generated by university research and public research institutions match the needs of industry in the region. This identification must be supported by recognising the entrepreneur/industry who would later be involved in the Smart Specialisation process. The reciprocal relationship between universities and industry will ultimately increase the productivity and growth of the region. This bond needs to be maintained so that it is not just a short-term relationship. Both actors must formulate this relationship so that it lasts in the long term.

Second, public sector investment support for research and development must receive an appropriate portion. Smart Specialisation leverages the diffusion of key technologies to initiate the EDP process. For this reason, R&D investment support

in less innovative regions must be appropriately proportioned. Education is still the dominant goal in less developed regions instead of increasing investment in R&D. This is a challenge in itself, i.e., how policymakers find solutions to this problem. At the same time, the region also wants to continue encouraging the economic structure's transformation through Smart Specialisation.

Third, there is the strength of the bond between the three main actors in the Triple Helix. Many findings prove the weak support and ties of actors in the Triple Helix in less developed regions, especially in Central and Eastern Europe and some parts of Southern Europe. Although it is not easy to realise the Triple Helix in these regions, the three actors' common perception and alignment of goals can support and form a strong bond. The government as a policymaker can take a central position or tend to be neutral between universities and industry. Instead of over-intervention, the government may be able to take a more persuasive approach to increase interest and encourage more solid cooperation between the Triple Helix entities, e.g., by creating a more harmonious and dynamic collaboration and communication environment, managing appropriate public spending on Entrepreneurial Discovery Processes (EDP) for Smart Specialisation in regions with less-developed R&D and innovation ecosystems, and offering special incentives to encourage their interest and increase their productivity.

This paper has limitations that I could not have avoided. Articles discussing universities and Smart Specialisations are not widely available. Although I found more than 50 articles that discussed this issue in Web of Science or Scopus, I wanted to focus on articles published in leading journals instead of proceeding papers. In addition, the relatively narrow topic of Smart Specialisation has limited this paper to discuss more broadly the universitiy role in regional development in general. Therefore, formulating a better methodology to conduct a systematic review of the university, regional development, and Smart Specialisation opens great opportunities for next papers to provide a better research impact.

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BOOK REVIEWS

Final report – Innovative strategies for retail revitalisation in medium-sized cities Urbact/RetaiLink, 2018, 170 pages

As an economist, in all my activities – both academic and practical – I have always paid special attention to the economic aspect of revitalisation which, in my opinion, when properly implemented throughout the process, guarantees much greater effectiveness and durability of the introduced changes. Moreover, I am also interested in the participation of local communities in the development of different projects in cities. Therefore, I found Final Report "Innovative strategies for retail revitalisation in medium-sized cities" extremely interesting. The report presents the results of a project in which 10 different medium-sized European cities participated. The cities and stakeholders were looking for ways to develop and adapt to the current needs of the retail sector which is an important element of the local economy and urban vitality. Each of the beneficiaries conducted an open and oriented dialogue that was aimed at creating an attractive offer in compliance with user expectations.

For centuries, the areas where trade operates have been not only the places where economic activities concentrate, but also the centre of local community life and a point of reference for shaping the identity of a city's inhabitants (Nary, 2001). Due to the nature of shops and service points operating particularly in city centres, their customers are not only the dwellers of city centres, but of entire cities or even regions. These areas frequently play the role of public space and tourist attraction, and determine the image of a city. However, technological progress and the changes to our buying patterns cause a decrease in the role and significance of high street sales in the functional structure of urban areas. These areas can be helped by adopting a coherent spatial development strategy, in particular as

far as trade functionality is concerned (Celińska-Janowicz, 2014; Guy, 1994). The discussed Report perfectly meets the needs of local governments in this respect.

The Report focuses on medium-sized cities, thus fitting the trends of urban policies of many countries including Poland (National Urban Policy, 2015; Urban Agenda for the EU, 2016). These policies emphasize the problems of starting modern development actions by medium-sized cities. Additionally, such places are more vulnerable to negative effects of economic crises or demographic changes. Changes connected with the outflow of inhabitants or retail sales from city centres are very visible here. Simultaneously, what is also visible is greater flexibility in management and greater motivation to improve the living conditions.

Our buying patterns have changed completely. Today, we are very eager to shop online. New business models have appeared on the market. Social media is used both as a communication tool and a means for supporting customers. How can empty buildings in city centres be re-filled with retail in this rapidly changing world? Project beneficiaries made an attempt to answer this question, each of them individually, considering their endogenous conditions, but also supporting each other and using different research methods to identify universal solutions.

The Report suggests research areas, phenomena, and indexes which enable one to determine the profile of a local consumer and their needs, as well as target consumer groups. One can learn the results of analyses which show typical consumer behaviour. Different research methods and tools have been used, starting from desk research of data obtained from banks, property market or mobile apps, to fieldwork and periodic interviews and surveys in the field or online. The third diagnostic step is to categorise the retail offer and the place according to consumer perception, i.e., one needs to be determine whether consumers are treated functionally, sensorily or symbolically, what has been the customer experience so far, and how a city is perceived from the point of view of its commercial offer. The conducted research has enabled researchers to understand the needs and preferences of inhabitants, which is definitely an appropriate starting point for developing proposals of necessary changes and strategies for the future. A big strength of the report is the fact that it illustrates subsequent phases of project implementation with concrete examples of beneficiaries, which might serve as genuine inspiration for other cities.

The Report focuses on the analysis of the retail offer, however, it rightly notices that the strategy for retail revitalisation needs to include several supplementary aspects as medium- sized cities require a set of actions and policies that shall create conditions promoting retail, e.g. via spatial planning, mobility, organisation of cultural events, tax regulations, and promotion. Retail revitalisation is not about opening new shops, as that is not very realistic. Focus should be placed on populating city centres and developing innovative commercial initiatives, as illustrated by the example of actions undertaken in Iqualanda (Spain). Another important aspect is the establishment of local partnerships that follow one vision and have common leaders. This issue is handled differently by different cities, which is determined by the local polit-

ical, institutional or organisational conditions, or by conditions related to the power of social capital. Some cities appointed Business Improvement Districts (BID) or Zones (BIZ), which enable the collection of taxes that are then earmarked for the improvement of a particular area through modernisation, cleaning works, improvement of safety, or marketing. Here, digital platforms were presented as they are more and more popular in cities providing simultaneous access to different service and commercial offers, organisation of various events for retail area enlivenment, and place branding. What interested me the most, however, was the part devoted to the organisation and adaptation of space to proposals included in the retail revitalisation strategy. Please remember that, as the report confirms, local tools supporting retail development not only should follow general principles of planning connected with the fact that, essentially, a city centre is home of leisure and recreational shopping and that there should be shops and services satisfying basic needs in the places of daily shopping, but also they should be well suited to the local specificity.

The core of the report and its most inspiring part are collected operating plans for particular cities developed within the project. These plans show how visions and innovative strategies for retail revitalisation can be elaborated under different conditions, and how they can fit the context of a particular place and its identity. They also show ways of reaching proposed solutions. Each city presents its own perception of the problem, though within commonly established frames, which constitutes another substantial value of the study. Several interesting conclusions which are included in the report may inspire local governments to take similar actions within their areas. This study is worth recommending, especially to administrators of medium-sized European cities. The Report may also be an interesting starting point for researchers from different countries and fields of science for further analyses and studies within the field of retail revitalisation.

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Christa REICHER, Fabio BAIRO-KAISER, Päivi KATAIKKO-GRIGOLEIT, Sarah MÜLLER, Jan POLÍVKA (eds), *Urban Integration. From Walled City To Integrated City, Stadt- und Raumplanung*, vol. 19, Zürich: LIT, 2019, 100 pages

Despite (or because of) the undeniable progress of the last two centuries, socio-economic exclusion and inequalities have not been effectively addressed yet. Not only is this observed when comparing countries or regions, but such problems are a constant concern locally, on a city or neighbourhood scales. Manifestations of those challenges – their scope, intensity, and the entities concerned – vary in space and time. Still, as they strike at the fundamental rights of individuals, households or larger communities, there is a pursuit for means and ways to mediate, level, balance, and overcome them, provided that is already within our capabilities. Much has already been said and written in this respect, however, quite often those issues are examined from too narrow points of view. The book by Reicher *et al*. aims at widening the perspective, combining multiple angles, visions, and experiences regarding social integration in the city against the context of contemporary global shifts and digital evolution.

Please consider some short technical information to start with. This publication has a small, handy format and a paper cover, which in hard times for traditional books might be an advantage for those who like to carry and read books not only in the office or at home. It was printed in colour (with the prevalence of striking pink) on acid-free paper, as the editorial page informs. The quality of the print is better where there is text and worse as far as graphic elements are concerned. However, that could be a deliberate act of the publisher or a result of using less environmentally damaging technology of print – it is hard to say. In any case, the content is legible enough, and the fact of supplementing it with coherent artworks by Antje Rieder, a professional graphic recorder, makes subsequent pieces of the text easier to comprehend and compare.

However, it is the content, not the cover or the illustrations that matters. The book is the result of an international symposium held in Essen (Germany) in 2018. The obvious implication of this fact is that it concerns problems of the pre-pandemic world, not to mention the recent war in eastern Europe. Contributions to this publication were made by practitioners, researchers, and their future successors, as students were also actively involved. The professional specialisations symposium participants included: urban and regional planning, architecture and urban design, economy, sustainable housing, heritage conservation, landscape architecture, and ecology.

The book consists of three major parts with an introduction and concluding thoughts by Christa Reicher, followed by information on contributors to this volume.

The major parts are divided further into sub-sections, two of which also have their own introductions (I could not understand why not all of them). The first part is entitled 'Transforming City Regions: Urban Integration in an International Perspective.' In general, it is a collection of abstracts, thematically organised into two parts: *1. Polycentricity + Multi-Scale Spatial Models*; and *2. Resilience + Diversity & Inclusion*. Some of the abstracts are insightful and extensive with a clear structure and useful references (e.g., 'Flexible Green Spaces' by Stephanie Haury, 'The Geographies of Urban Resilience in German Large Cities' by Asad Asadzadeh, Theo Kötter and Dominik Weiβ, or 'Collective Challenges and Joint Arrangements in the Dispersed Territory of Flanders' by Maarten Gheysen, Kris Scheerlinck and Erik Van Daele), while a few remain more superficial and offer little to be learned. The abstracts are followed by section *3. Integrated Urban Regions: Academia, Education, Practice*, which takes the form of a transcript illustrated with a few photographs. The reader learns about the moderated conversation with which the symposium was concluded.

The second part of the book, i.e., 'From walled City to Integrated City. International Summer School,' presents the course of a design workshop held in Zollverein Essen (formerly a hard coal mine and coking plant, today recognised as a UNESCO heritage site) and at Dortmund Technical University. The event was supposed to promote cooperation between schools of different geographical origins. The participants were associated with planning and architecture, so they tackled problems within urban planning and management, as well as small-scale integration. The framework of the workshop was built upon four anchor points, namely education, public space, housing, and work. Six thematic groups were established to explore different, though essentially intertwining, aspects of urban integration:

– 'The Triple F' with food and food-related activities as a core aspect (cultivation, preparation, 'green education' – both literally, which means, e.g., classrooms decorated with biotic elements, and figuratively, such as cooking schools or workshops);

– 'Nodes + Threads' focused on developing pedestrian and bike infrastructure. The aim of this part was to enhance integration by removing physical and social barriers in the Zollverein site;

– 'ART-HUNT' incorporated ideas such as art, learning, recognition, social participation, tourist attraction, and digital advancement so that economic development could occur to the benefit of local inhabitants;

– 'Blue Threads' accentuating the integrative role of surface waters. The participants worked on two types of water systems – of flat and linear structure, as well as two scenarios – within 'normal' conditions, and if water drainage devices no longer operate;

– 'Common ground' emphasised the role of common, long-life learning for fostering communication, and acquiring and sharing knowledge. That was supposed to be achieved through knowledge hubs, urban learning landscape, and the society that may take advantage of it.

– 'Fragmentation Integrated' aimed to develop a coherent vision of the area that consisted of the Zollverein site, as well as forest, semi-public spaces, and a car logistics centre. The idea was to, again, transform barriers into 'keystones' and opportunities for this area and its users.

For each of those thematic groups, the general idea and goals were presented in the book, together with some deeper thoughts and conclusions. However, adding some technical and practical details would be interesting, even if it were to take a much abbreviated form. What kinds of tasks were assigned? How long did it take to perform them? What were the routes they explored on the site? What kinds of difficulties did the participants and organisers encountered and how were they overcome? Something like that could be extremely useful for conducting analogous or loosely inspired workshops. Such an addition would further enhance the educational value of this book.

Finally, there is the question whether I would recommend the book. I think yes. Though I find it more suitable for those who are not very familiar with the ideas of polycentric development, sustainability, resilience, diversity, and integration within the city scale. Either senior students or PhD candidates and young academics who are just beginning to explore such fields as planning and architecture, sociology, and geography could benefit from it for sure. The same refers to local politicians or activists interested in social cohesion, diverse environments, economic shift, and adaptation in the global digital world. For more mature and experienced researchers, the content would probably be less gripping and surprising, as it is not an in-depth complex and coherent scientific analysis that enables tremendous theoretical or empirical advancement. Nevertheless, even reader advanced in the topic may find some useful pieces of knowledge here. After all, one cannot deny the fact that such events and post-conference books usually are inspirational and thought-provoking, and, therefore, facilitating future scientific, educational or practical achievements.

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