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Editorial preface

Dear Readers!

On the first (editorial) page of issue 2 of our journal 2023, the attentive reader will notice a significant change. The Hungarian Academy of Sciences has upgraded our journal to a higher class (from C to B). For this, we thank our authors, proofreaders and editorial predecessors who have always attached great importance to the professional quality of our journal!

This achievement is a commitment! We wish to further improve the international visibility of our journal and the accessibility of our readership. This effort is reflected in our English-language issue, which contains 8 papers.

We are confident that the topics addressed by our authors deserve further thought and reflection.

Lectori salutem!

Miskolc, June 2023

The Editors

TANULMÁNYOK / STUDIES

Áron Kincses¹ – Sebestyén Sándor Dudás²

Hungarian-Hungarian international migration within the Carpathian-basin, 2011-2017

Hungary has a unique role in international migration. The research introduces the facts and figures about foreign-born population in Hungary, focusing on migrants arriving to Hungary from the Carpathian Basin and their geographical networks, revealing the source areas of migration. The analysis interprets those involved in international migration in broad terms; as such, it is not focused solely on the movements of foreign citizens, but rather examines the effects of migration together with the naturalized Hungarians born abroad.

Key words: International migration, Carpathian Basin, Hungary

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1. Introduction and theoretical background

It is a fact that the processes involved in migratory movements have the potential to play a significant role in population development. This is especially true in the case of Hungary. The transformation of the Hungarian ethnic spatial structure since the conquest in the Carpathian Basin can be divided into four main periods. The first (the period between the 10th and 15th centuries) mainly consisted of the settlement of non-inhabited areas and the Hungarian expansion that took place at the expense of other nationalities; the second (from the 16th to 18th centuries) was characterised by the significant decline of ethnic Hungarians as a result of the Ottoman (Turkish) occupation, the wars of liberation and the subsequent resettlement. In the third period, (from the 19th to the early 20th century), due to social factors which resulted predominantly from Hungarisation, the regeneration of the medieval Hungarian ethnic territories, the Hungarian ethnic expansion and the loss of territory of the other ethnic groups unfolded and accelerated, which could only be halted by the Trianon Peace Treaty and the division of the territories of the historical Hungarian state. In the fourth period, which is still in progress, within the territory of the post-Trianon country, an increased Hungarian ethnic advancement can be seen, while past the Trianon borders, a general decline was observed in ethnic-territory Hungarians as Slovaks, Rusyns, Romanians, Serbs, Croatians and Slovenians advanced. This was only interrupted by a short, temporary Hungarian ethnic expansion as the result of the revisions between 1938 and 1944 (Kocsis K., 2002, 2003, 2015; Kocsis K. et al., 2015).

The third demographic disaster³ was a turning point in the population development of Hungarians in the Carpathian Basin. After the Great War, due to the artificial intervention in the domestic population principles, what had been until then the organic processes of population development (which helped through the first two disasters) were halted (Tóth P., 2018). In fact, the population development of Hungarians in the Carpathian Basin is interrelated; it was a mutually supportive

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³ The first demographic disaster was the Tatar invasion; the second was the Ottoman occupation; and the third was the Trianon Peace Treaty, after the “Great War”; while the fourth was caused by the loss of World War II. Following the 1956 Revolution there was also a significant loss of population, but it is not measurable as in the four demographic catastrophes above.

dual process. One element of this process was the continuous population development determined by the fertility of the ethnically unified Hungarians, modified by mortality. The other element of the process consisted of members of the other populations assimilating into the Hungarians. Within the framework of the “Hungarian Empire”, the results of both processes ensured the thriving growth of the Hungarian population beyond the natural rate, which enabled Hungarians to overcome their demographic disasters by 1918. This also means that following the third demographic disaster, in the case of Hungarians caught between the new borders, the practices of the pre-1918 period no longer, or just barely, determined the development of the Hungarian population. With the partition of the country, the (domestic) movement that had worked until then came to a halt, by which non-Hungarians, or people of mixed nationalities who migrated to the central areas inhabited by a Hungarian majority, assimilated to those living there, increasing the numbers of Hungarians. After 1918, internal migration served only the territorial redistribution of the population; movements were made from the new border areas towards the centre (Tóth P., 2010, 2018).

The role of international migration in population replacement changed after 1918. As a result, the majority of “foreigners” migrating to the country (namely, the migration of Hungarians living in neighbouring countries to Hungary) did not increase the total number of Hungarians, only the number of Hungarians living in Hungary. With the changes to the borders, the people who until then had been counted as national migrants; transformed into international migrants. In the long term this international migration no increases the number of Hungarians within the Carpathian-Basin, but paradoxically, it plays (to strengthen assimilations) a part in reducing those numbers (Kocsis K. et al, 2015, Tóth P., 2018).

Nevertheless, it is important to recognise that at the core of the structure of their respective groups, the structural development of the Hungarians living in Hungary or Hungarian-speaking communities in neighbouring countries, is independent of each other only at first glance. All that is taking place in the area of demographic processes in Hungary, is only a part of the wider demographic processes of the Hungarian linguistic community (Tóth P., 2018, Dövényi Z., et al, 2008).

2. Data and methodology

There are several types of data sources available on foreign nationals, mostly in the form of administrative records. These are registers created by a given administrative organisation (for the purposes of taxes, social insurance, etc.) to support the implementation of its own statutory administrative tasks (Gárdos É. et al., 2008). In these cases, statistical and research needs do not primarily determine the concept and the content, the units of the target population, the reference time of the data and definitions. Another difficulty is that the content and structure of the register may suffer changes as a result of changes in legislation. All this means that, in some cases, it is difficult to obtain information directly from these data systems to meet scientific needs.

The advantage of census data over administrative data is that everyone can be linked to their habitual place of residence, along with all the variables of the survey. This provides the opportunity of gaining insight into the living conditions and economic, educational and social backgrounds of Hungary’s inhabitants in territorial breakdowns for statistical purposes. The census is conducted throughout the country at a single point in time, with the same content, and based on uniform methodology. Surveys were also carried out for Hungarian citizens who habitually live in the national territory, or for citizens staying abroad temporarily (12 months or less); moreover, foreign nationals and stateless persons who stay in the country’s territory for a given period of time are also listed. Among the foreign nationals not included are members of diplomatic bodies and their family members; members of foreign armed forces on the basis of resolutions by the Parliament or government, as well as people in the country for the purposes of

tourism (resting, hiking, hunting, etc.), personal visits, medical treatments, business meetings, etc. However, this information is not available as often as in administrative records.

We used these two types of statistical data sources. We worked with the 2011 and 2017 stock data of the Hungarian migration databases as they are relevant to the topic (Personal Data and Address Registers, the Ministry of Interior's Records of Foreign Residents, Population Census, microcensus). The data underlying the analyses were not directly available, we had to make use of separate classifications for the assessment of territorial impacts. The mapping of the source settlements and regions of international migration in the Carpathian Basin enables a deeper understanding of the migration processes affecting the Carpathian Basin. Currently, country classifications are automated in administrative sources, with the list of foreign settlements posing a number of challenges: typing errors, instructions, and the city names in different languages made progress difficult. Many large cities have been recorded under many different ways, and in many cases, settlements that were formerly independent were included⁴.

Both data sources contain information that is missing from the other file (for example, the microcensus contains data related to education and economic activity which are not part of the Ministry of Interior's database; however, the administrative database contains the settlements of birth). For this reason, it was necessary to link both files⁵.

For 2011, we added administrative data to the census (this is the source of official statistics data in the census reference year), while in the case of 2017, We added the microcensus information to the Ministry of Interior's database (in the years when there is no census, official statistics are provided by the administrative records). Therefore, the 2017 distributions may slightly differ from the microcensus results.

The analysis of international migrants is often limited to foreign nationals living in a given country. However, the demography involved in migration is much wider and its structure is more nuanced. When assessing the effects and extent of immigration, naturalisations and foreign-born citizens whose number significantly exceeds that of foreign nationals cannot be neglected. Therefore, this study focuses on the foreign-born population (including those who were granted citizenship of the given country as well as those who were not).

3. International migrants in Hungary Quantities and nationalities

Often times, international migrants living in Hungary are examined in simplified terms as foreign citizens residing in Hungary. Nevertheless, the population involved in migration is much larger and its structure much more nuanced.

⁴ Just a few examples:

(1) The village of yore of Székelyhidegkút (*Vidacutu Român* in Romanian, *Kaltenbrunnen* in German) is today a village in Romania, in Harghita County. It emerged from the unification of Magyarhidegkút and Oláhhidegkút in 1926. The northern part of the village is Hungarian -, the western part of Oláhhidegkút, currently a part of the Hidegkút settlement. - Hidegkút (*Vidăcut* in Romanian) is a village in the Romanian Harghita County. It belongs administratively to Székelyandrásfalva.

(2) Horthyvára: Máriamajor (*Степановићево/Stepanovićevo* in Serbian, between 1941 and 1944 Horthyvára; in 1941-it was called Bácsbadikfalva for a short period), today belongs to the Újvidék township in Serbia, in Vojvodina, in the Southern-Bácska district.

(3) Kadicsfalva – (*Cadiseni*) is today a part of the city of Székelyudvarhely (According to the chronicles, in 1566 it was known as *Kadichfalva*).

(4) Csekelaka (*Cecălaca* in Romanian) village in Romania, in the Maros County. Today, it belongs to the Cintos Township.

⁵ Marcell Kovács, Director of the Population Census and Demographic Statistics Department, and his experts, Zita Ináncsi and János Novák, provided essential assistance to this work. I sincerely thank them for their support here.

If we examine solely the population of the previous years, we find that the number of foreign nationals in 2011, 143,197, increased by only 5.5% by 2017, when 151,132 foreign nationals lived in Hungary. For example, thanks to global migration trends, in 2017 more Chinese citizens resided in Budapest more than Romanians. However, this data needs further explanation.

When examining the effects and extent of immigration, we must not forget the effects of naturalization: Hungarian citizens who were born abroad but already reside in Hungary (the overwhelming majority were born abroad, as foreign citizens, and only became Hungarian citizens after migrating to Hungary; the smallest part of them were born abroad but as Hungarian already). Their number significantly exceeds that of foreign nationals. Together, the two groups mentioned cover the target population we mean to examine: the population of foreign origin living in Hungary (the group is composed of foreign citizens and Hungarian citizens born abroad). Within this group, the number of foreign citizens is showing a steady decrease: from 37% in 2011 to 29% in 2017.

In 2017, the 'population of foreign origin' living in Hungary was already 521,258 (a 33% increase since 2011). Those emigrating Hungarians who returned to live to Hungary (127,000 people) are not included in this figure of the target population. These figures counter the statement that Hungary's international migration balance is negative (Juhász et al. 2017).

At the same time, it is important to note that the majority of the naturalized migrants arrive from neighbouring countries (Blaskó Zs. – Gödri I., 2016; Siskáné et al, 2017; Egedy T., 2017). In 2011, 288,024 people living in Hungary arrived from countries of the Carpathian Basin. In 2017, their numbers increased by 22% (to 352,506 people, of which 313,000 were Hungarian). Today, the number of people born in Romania living in Hungary is higher than the total population of Debrecen, the second largest settlement in the country. During the period under review, the neighbouring countries saw a dynamic rise in numbers, the largest share of which was in the case of Ukrainian migrants, at 81%.

Table 1: Hungarian citizens born abroad and foreign nationals by major countries

| Country of citizenship/place of birth | 2011 | | | 2017 | | |
|---------------------------------------|------------------|------------------------|---------------------------------------|------------------|------------------------|------------------------------------|
| | Foreign citizens | Hungarians born abroad | Total of population of foreign origin | Foreign citizens | Hungarians born abroad | Total population of foreign origin |
| Romania | 38 574 | 139 093 | 177 667 | 24 040 | 182 387 | 206 427 |
| Germany | 16 987 | 7 294 | 24 281 | 18 627 | 16 039 | 34 666 |
| Slovakia | 8 246 | 25 195 | 33 441 | 9 519 | 17 376 | 26 895 |
| Austria | 3 936 | 2 897 | 6 833 | 4 021 | 7 102 | 11 123 |
| Great Britain | 2 602 | 1 184 | 3 786 | 3 081 | 8 578 | 11 659 |
| France | 2 201 | 1 123 | 3 324 | 2 523 | 2 156 | 4 679 |
| Netherlands | 2 058 | 461 | 2 519 | 2 814 | 1 208 | 4 022 |
| EU28 | 85 414 | 183 761 | 269 175 | 76 270 | 248 524 | 324 794 |
| Ukraine | 11 820 | 23 953 | 35 773 | 5 774 | 59 272 | 65 046 |
| Serbia | 7 752 | 21 306 | 29 058 | 2 312 | 37 497 | 39 809 |
| Europe other | 7 536 | 8 764 | 16 300 | 14 838 | 5 463 | 20 301 |
| Europe total | 112 522 | 237 785 | 350 307 | 99 194 | 350 756 | 449 950 |
| China | 8 852 | 939 | 9 791 | 19 111 | 415 | 19 526 |
| Vietnam | 2 358 | 728 | 3 086 | 3 256 | 825 | 4 081 |
| Iran | 1 523 | 163 | 1 686 | 2 444 | 248 | 2 692 |
| Asia other | 9 571 | 2 930 | 12 501 | 15 126 | 5 051 | 20 177 |
| Asia total | 22 304 | 4 760 | 27 064 | 39 937 | 6 539 | 46 476 |
| United States | 3 022 | 1 924 | 4 946 | 3 198 | 5 294 | 8 492 |
| Canada | 484 | 807 | 1 291 | 513 | 2 218 | 2 731 |

| | | | | | | |
|------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| America other | 1 237 | 1 054 | 2 291 | 1 686 | 1 637 | 3 323 |
| America total | 4 743 | 3 785 | 8 528 | 5 397 | 9149 | 14 546 |
| Nigeria | 1 015 | 105 | 1 120 | 1475 | 192 | 1 667 |
| Egypt | 472 | 176 | 648 | 1182 | 567 | 1 749 |
| Africa other | 1 366 | 909 | 2 275 | 3 328 | 1 639 | 4 967 |
| Africa total | 2 853 | 1 190 | 4 043 | 5 985 | 2398 | 8 383 |
| Australia and Oceania | 775 | 350 | 1 125 | 619 | 1284 | 1 903 |
| Total | 143 197 | 247 870 | 391 067 | 151 132 | 370 126 | 521 258 |

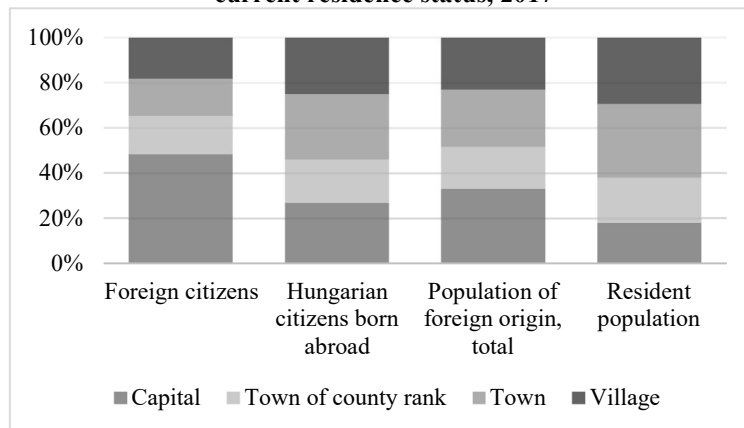
Source: Hungarian Central Statistical Office (HCSO)

Territorial characteristics

In the case of internal migration, it is true that social groups with better labour market positions migrate to regions that feature higher economic indicators, better image, and higher positions in the settlement hierarchy (Bálint L., et al., 2017). This also strengthens the differences in the spatial social structure and the territorial separation of different prestigious social groups.

These findings are only partially characteristic of international migration. In addition to income opportunities, a more important role is played by the territorial location of the destinations and the natural environment (Dövényi Z., 2011). Therefore, the spatial distribution of the population of foreign origin is different than the distribution of the Hungarian-born population; thus, their influence is higher in the areas they prefer than in the national context.

Figure 1: Distribution of the population of foreign origin and resident population by current residence status, 2017



Source: own calculation, based on the database of HCSO

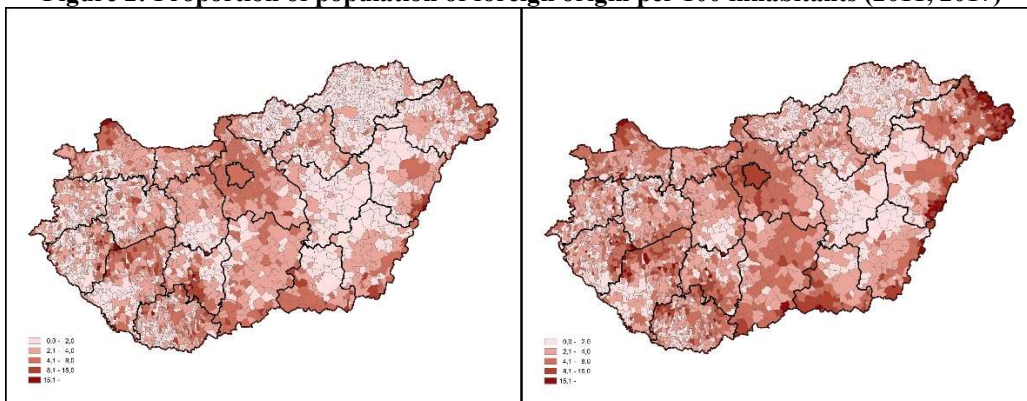
Through the lens of migration, there are three regions in which the examined migration groups are permanently and generally present in larger numbers and proportions in Hungary: Central Hungary, the areas near the borders and the Lake Balaton region.

Budapest and Pest County attract people from a greater distance, and the majority of non-European foreigners live here. Many of them are employed, younger on average, and have higher education. It is primarily economically active, highly qualified foreign citizens who settle down here. Over the past ten years, Budapest has become a global destination for migration. Nationwide, the proportion of foreign citizens making national income statements (no data are available for Hungarian citizens born abroad) is close to 2% of the resident population. They account for more than 3% of the income tax. In Central Hungary, these ratios are higher than 5%.

In Hungary, where the majority of foreign citizens still continue to arrive from neighbouring countries, the location of the target areas also plays a decisive role in the distribution of the foreign population. Therefore, in making a choice of a new place of residence the *border regions* also play an important role, in addition to the economic centres. In these settlements, the composition of citizenships is not as diverse; rather, most of the foreigners simply arrive from the other side of the border.

The region of *Lake Balaton* is chosen mainly by German, Austrian, Dutch, and Swiss pensioners; older people usually choose this area because their pensions provide them with higher purchasing power, as well as for the recreational opportunities and the value of a natural environment. In many cases, foreigners come as tourists before migrating (Kincses Á., 2014) and then arrive having already detailed information about the target areas. The volume of elderly migration increased significantly in the period under review.

Figure 2: Proportion of population of foreign origin per 100 inhabitants (2011, 2017)

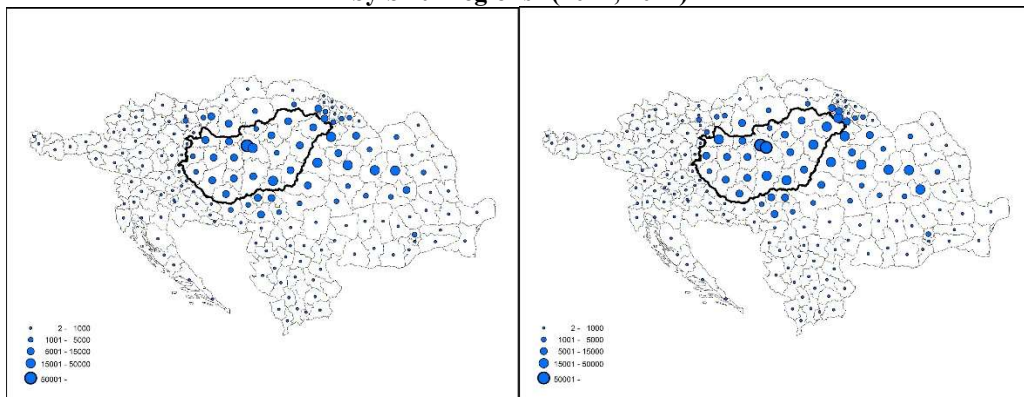


Source: own calculation, based on the database of HCSO

4. The Carpathian Basin's territory sources of international migration to Hungary

From a demographic, economic, social and geographic perspective, the focus of research on migration in Hungary is primarily on the impact in the receiving areas. The reason for this is twofold. On one hand, analysing the consequences for Hungary requires this approach, on the other hand, emigration areas are difficult to identify for the most part, which makes research on the Carpathian Basin remain unobserved. Using official statistics, data links and classifications mitigates the omission to study the wider migration processes, since demographic processes are not worth examining only within the current borders of the country. Therefore, the primary goal is to explore the migration source areas in the neighbouring countries, to learn more about the effects in the areas that send migrants, and to explore the overall picture of the situation in the Carpathian Basin between 2011 and 2017. In the case of foreigners or those who are already Hungarian citizens, the observation of the effects of emigration is not relevant, the population of foreign origin was considered collectively.

In 2017, the population of foreign origin from Hungary's neighbouring countries living in Hungary was 352,506. Of these, 7,131 were born in Hungary, and 560 of them had never stepped foot in their country of nationality (for example, Romanian citizens born in Germany, or Serbian citizens born in Sweden). Thus, a total of 344,815 people who were born in one of the neighbouring countries (regardless of nationality) lived in Hungary in 2017. This represents a 24% increase compared to 2011.

Figure 3: Population of foreign origin from the neighbouring countries living in Hungary by birth regions ⁶ (2011, 2017)

On January 1, 2011, the majority of the population born abroad but now living in Hungary had been born in the counties of Mures (27,879 persons), Bihor (27,374 persons), Hargita (26 439 persons), Cluj (21,667 persons), Satu Mare (17,102 persons), in the Nitriansky kraj (13,742 persons), Covasna county (10,821 persons), Berehove rajon (9,301 persons), Severnobački okrug (8 877 persons), Uzhhorod rajon (7,958 persons) and the Severnobanatski okrug (7,668 persons). These are the Romanian, Transcarpathian, Vojvodina and Slovak areas where the proportion of Hungarian nationals is high (Kapitány B., 2015).

By 2017, only the order of the five major Transylvanian counties had changed (Hargita 35,613, Mures 32,433, Bihor 31,587, Satu Mare 20,075, and Cluj 19,540). The rest of the major source areas were Berehove rajon (19,429 persons), Covasna County (17,021), Severnobački okrug (12,769), Uzhhorod rajon (12,410), Severnobanatski okrug (11,687), Vynohradiv rajon (11,628) and the Nitriansky kraj (10,286).

From the major source regions, the areas where the ‘emitting’ role was strengthened for the years under review were Transcarpathia (at rajons level: Vynohradiv: 259%, Berehove: 209%, Mukachevo: 177%, Khust: 159%, Uzhhorod: 156%, Tiachiv: 131%), as well as the Bacau (243%) and Covasna (157%) counties.

The main feature of international migration to Hungary is that the majority of the immigrating population is either of Hungarian nationality or is a native Hungarian speaker. The strength of the linguistic and cultural relations extending beyond the borders is primarily the result of the peace treaties that ended World War I and World War II. This determining factor is steadily, but slowly weakening. The main reason for this is the gradual shift of the countries of origin from the neighbouring countries to a wider range.

It is possible to identify the demographic processes behind the phenomenon in the period before 1918. The proportion of non-Hungarian native speakers is higher in those arriving from Ukraine (not including the Transcarpathian regions), Northern Slovakia, Serbia (not including Vojvodina), as well as in Austria, Croatia and Slovenia.

In the case of Ukraine, the prominent value can be linked to the Russian-Ukrainian conflict that has been protracted since 2014, the economic and social crisis, and general uncertainty (Karácsonyi D. et al., 2014).

⁶ The map displays the places of birth in the neighbouring countries of citizens living in Hungary, while the Hungarian parts show those who were born in nearby countries but elected to live in Hungary.

5. International migration networks in the Carpathian Basin, 2011, 2017

International migration to Hungary is characterised by the fact that the majority of the immigrant population has Hungarian nationality or is a native Hungarian speaker. The strength of cross-border linguistic and cultural relations is primarily the consequence of the peace treaties that concluded World War I and World War II. In 2017, 3.6% of Hungary's resident population was born in other countries of the Carpathian Basin.

This chapter aims to go beyond the classical study of international migration by not only examining the phenomenon according to Hungarian destination areas, but also linking sending and receiving areas by identifying the areas of origin.

The relations of the place of birth and current place of residence of the foreign-born population arriving to Hungary are reviewed at NUTS3 level, based on data of 2011 and of 2017. In the case of Ukraine, due to the large size of the country, only Transcarpathia was considered in the study, since nearly 90% of Ukrainian migrants arrive from this region. (As the NUTS classification does not exist in Ukraine (Mezencev K., 2010), for Transcarpathia (Zakarpatska Oblast) the analyses were carried out at "raion" level, a less aggregated level than "oblast". From the 161 regions curated, significant concentrations can be detected in the migration matrix to the 19 Hungarian counties and Budapest. Omitting the pairs of regions, which account for more than 0.5% of total migration, a much narrower group is available than before (see table 2 and 3.). Thus, 41.6% of migrations were concentrated in 1% of all matrix cells in 2011, which increased by 4.7 percentage points by 2017.

In 2011, Central Hungary was the most attractive destination to those arriving from Transylvanian counties. 3.24% of migration from neighbouring countries to Hungary took place between Mures and Budapest, 3.19% from Harghita County and 3% between Cluj-Napoca and the Hungarian capital. Active contact spaces and intense flows (Anderson et al., 1999; Baranyi B. et al., 2004; Hansen N., 1977; Van Geenhuizen, M. et al., 2001) developed between the interconnected counties, which can be explained partly by the phenomenon of circular migration (Fercsik R., 2008; Illés S. et al., 2009) and partly by the easier interaction with family members who remained home (Rédei M., 2007). The most significant of these were the movements between Bihor and Hajdú-Bihar (1,58%), Satu Mare and Szabolcs-Szatmár-Bereg county (1,05%), North Bačka, North Banat and Csongrád county (1%, 1,2%), as well as from Beregovo and Uzsgorod raion to Szabolcs-Szatmár-Bereg County (0,99%, 0,68%).

By 2017, the number of pairs of regions affected by more than 0.5% of migration from neighbouring countries to Hungary increased. Hungary's migration relations widened, the more distant areas of neighbouring countries also became source areas by smaller volumes, while the regional role of the districts of Trnava, Bratislava, Košice and Nitra somewhat weakened. The importance of Budapest and Pest County further strengthened, as well as the migration weight of Szabolcs-Szatmár-Bereg County, mainly because of those arriving from Ukraine. By 2017, the proportions of migration from Harghita, Mures to Central Hungary increased slightly, however the rates of border connections strengthened to a greater extent.

Table 2: The proportion of major migration flows from neighbouring countries to Hungary (%)⁷, 2011

| Foreign /Hungarian counties | Budapest | Pest | Komárom-Esztergom | Győr-Moson-Sopron | Tolna | Hajdú-Bihar | Szabolcs-Szatmár-Bereg | Bács-Kiskun | Békés | Csongrád |
|-----------------------------|----------|------|-------------------|-------------------|-------|-------------|------------------------|-------------|-------|----------|
| Suceava | 0.09 | 0.07 | 0.00 | 0.01 | 0.57 | 0.00 | 0.01 | 0.21 | 0.03 | 0.02 |
| Arad | 0.59 | 0.28 | 0.03 | 0.06 | 0.02 | 0.06 | 0.02 | 0.08 | 0.33 | 0.33 |
| Bihor | 2.55 | 1.75 | 0.21 | 0.37 | 0.10 | 1.58 | 0.18 | 0.30 | 0.59 | 0.30 |
| Cluj | 3.01 | 1.90 | 0.20 | 0.25 | 0.07 | 0.28 | 0.11 | 0.24 | 0.15 | 0.15 |
| Satu Mare | 1.43 | 1.10 | 0.14 | 0.21 | 0.05 | 0.67 | 1.05 | 0.17 | 0.13 | 0.10 |
| Sălaj | 0.64 | 0.60 | 0.06 | 0.08 | 0.02 | 0.13 | 0.08 | 0.09 | 0.08 | 0.07 |
| Covasna | 1.27 | 0.92 | 0.18 | 0.14 | 0.08 | 0.08 | 0.04 | 0.14 | 0.09 | 0.10 |
| Harghita | 3.19 | 2.34 | 0.21 | 0.33 | 0.18 | 0.22 | 0.15 | 0.39 | 0.27 | 0.34 |
| Mures | 3.24 | 2.35 | 0.30 | 0.44 | 0.16 | 0.26 | 0.14 | 0.42 | 0.27 | 0.32 |
| Trnava district | 0.37 | 0.17 | 0.08 | 0.55 | 0.10 | 0.02 | 0.03 | 0.12 | 0.07 | 0.05 |
| Nitra Region | 1.04 | 0.64 | 0.85 | 0.40 | 0.24 | 0.04 | 0.04 | 0.15 | 0.22 | 0.12 |
| North Bačka District | 0.73 | 0.24 | 0.03 | 0.07 | 0.12 | 0.02 | 0.01 | 0.50 | 0.05 | 1.00 |
| North Banat District | 0.48 | 0.21 | 0.04 | 0.06 | 0.06 | 0.03 | 0.01 | 0.22 | 0.06 | 1.20 |
| South Banat District | 0.56 | 0.17 | 0.03 | 0.05 | 0.13 | 0.02 | 0.02 | 0.26 | 0.05 | 0.37 |
| Uzhhorod Raion | 0.72 | 0.40 | 0.05 | 0.05 | 0.02 | 0.23 | 0.68 | 0.06 | 0.04 | 0.03 |
| Berehove Raion | 0.79 | 0.45 | 0.06 | 0.06 | 0.03 | 0.18 | 0.99 | 0.08 | 0.04 | 0.05 |

Table 3: The proportion of major migration flows from neighbouring countries to Hungary (%), 2017

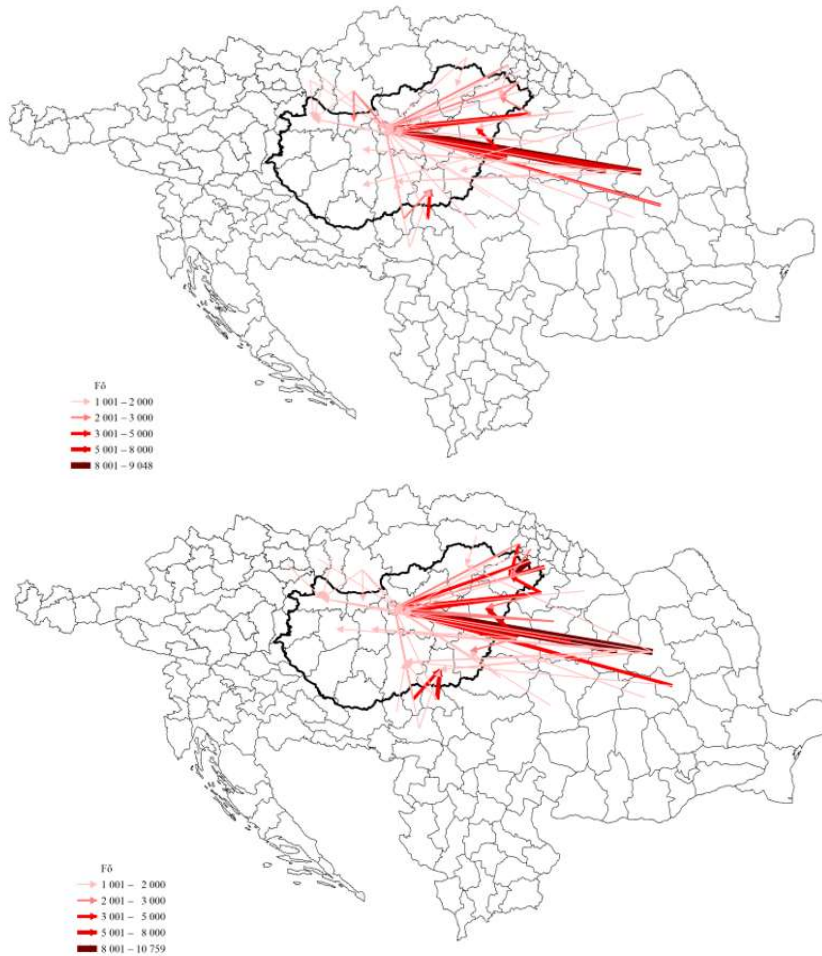
| Foreign/Hungarian counties | Budapest | Pest | Komárom-Esztergom | Veszprém | Hajdú-Bihar | Szabolcs-Szatmár-Bereg | Bács-Kiskun | Békés | Csongrád |
|----------------------------|----------|------|-------------------|----------|-------------|------------------------|-------------|-------|----------|
| Arad | 0.31 | 0.32 | 0.02 | 0.03 | 0.05 | 0.01 | 0.04 | 0.52 | 0.22 |
| Bihor | 1.94 | 1.52 | 0.19 | 0.28 | 2.05 | 0.17 | 0.22 | 0.70 | 0.25 |
| Cluj | 2.08 | 1.40 | 0.15 | 0.26 | 0.21 | 0.09 | 0.16 | 0.10 | 0.09 |
| Satu Mare | 1.20 | 1.14 | 0.12 | 0.16 | 0.66 | 1.32 | 0.12 | 0.09 | 0.08 |
| Sălaj | 0.71 | 0.63 | 0.05 | 0.05 | 0.21 | 0.09 | 0.07 | 0.07 | 0.06 |
| Covasna | 1.39 | 1.23 | 0.19 | 0.27 | 0.09 | 0.04 | 0.51 | 0.10 | 0.09 |
| Harghita | 3.15 | 2.59 | 0.23 | 0.55 | 0.26 | 0.16 | 0.57 | 0.19 | 0.35 |
| Mures | 2.86 | 2.66 | 0.27 | 0.21 | 0.22 | 0.10 | 0.47 | 0.18 | 0.42 |
| Nitra Region | 0.51 | 0.29 | 0.58 | 0.24 | 0.02 | 0.04 | 0.07 | 0.09 | 0.05 |
| North Bačka District | 0.69 | 0.25 | 0.03 | 0.04 | 0.03 | 0.01 | 0.75 | 0.06 | 1.30 |
| North Banat District | 0.44 | 0.24 | 0.04 | 0.05 | 0.03 | 0.02 | 0.41 | 0.08 | 1.58 |
| Uzhhorod Raion | 0.80 | 0.39 | 0.06 | 0.04 | 0.24 | 1.32 | 0.13 | 0.03 | 0.03 |
| Berehove Raion | 1.00 | 0.52 | 0.07 | 0.05 | 0.24 | 2.88 | 0.10 | 0.04 | 0.04 |

⁷ The total foreign-linked population born in the neighbouring countries and residing in Hungary =100%

| | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|
| Mukachevo Raion | 0.44 | 0.23 | 0.03 | 0.03 | 0.16 | 0.77 | 0.05 | 0.03 | 0.02 |
| Vynohradiv Raion | 0.61 | 0.31 | 0.06 | 0.04 | 0.16 | 1.64 | 0.07 | 0.02 | 0.02 |

The growing appreciation of the capital city area is evident not only in the larger sending regions, but also in most of the Carpathian Basin (Rédei M., 2009). This Hungarian region, is the clear destination for international migrants, even from greater geographical distances (Soltész B. et al., 2014). This is particularly true for those of working-age, with higher educational attainment, working in managerial position, as well as for those living in households without children. Border areas are mostly considered as local destinations. In case of shorter geographical distances and movements close to the border area, the proportion of those moving with their children is much higher, the educational attainments and occupations of migrants are more diversified, but there are no significant differences in their economic activity compared to that of migrants of a longer distance.

Figure 4: The relations of the region of birth and region of the current place of residence in Hungary among the foreign-linked population (persons)⁸ (2011, 2017)



⁸ The illustrative maps were prepared by the QGIS software. I am grateful for the contribution of my colleagues, Prof. Géza Tóth (Hungarian Central Statistical Office) and Dr. Lajos Bálint (Hungarian Demographic Research Institute).

6. Conclusions

International migration into Hungary is markedly differentiated into two levels: the global migration effect, and the processes flowing between Hungary and its neighbouring countries, which have been going on for a long time. The main characteristic of international migration in Hungary is that the largest part of the immigrant population is of Hungarian nationality or speaks Hungarian as a native language. The strength of the linguistic and cultural relations extending beyond the border are the outcome of the peace treaties that ended World War I and World War II.

The reproduction of minorities living in the neighboring countries is not just a matter of natural demographic processes. Migration also plays a significant role. Those arriving to Hungary reduce the numbers of the Hungarian population in the place of emigration, where in most cases, regardless of this, population loss takes place due to natural demographic causes. In turn, in areas where the number of Hungarians could grow, this natural growth is partly diminished by migration. On the other hand, migration, as an age-specific process, influences the socio-economic progresses of the source territories through indirect effects (through dependency rates, mean age, economically active rates, etc.). Migration to Hungary from abroad does not change the total number of Hungarians in the Carpathian Basin in the short term. However, in the long term this number decreases, since they have a significant influence on the ethnic spatial structure, and in the local regions of emigration, schooling, labor market, cultural and social opportunities decrease with the number of Hungarians; ethnic relations may narrow, and together with the scattering, assimilation may appear or accelerate.

Population movements in the late 1980s and early 1990s made it clear that the demographic processes taking place in the Hungarian linguistic community – despite the fragmentation occurring in 1918, and the nearly 100 year old ‘distributed development’ – can be fully understood only if we examine them together, as a single process. It is important to recognize that demographic processes inside and outside of the current border are similar in nature. Therefore, what we see happening in demographic processes in Hungary is only a part of the wider demographic processes of the Hungarian language community. The goal might not only be stopping the downsizing of the Hungarian population in Hungary, but also in the Carpathian Basin as well. Accomplishing this is not an easy task, as it may not be in line with the national interest of the neighboring countries.

The migration processes described in this study would have a significant impact on the ethnic spatial structure and numbers of Hungarians of the Carpathian Basin, if the numbers of other ethnic groups did not decrease similarly to the Hungarians. Strengthening the number of people staying in their home country, increasing the number of return migrations, and increasing the fertility rate of local Hungarians could all form the basis of a solution to this problem. Thus, an attainable goal would be to increase the proportion of Hungarians in the Carpathian Basin to over 50% again. Currently, the biggest barrier to this process is the loss of population, which affects the Hungarian population of the Carpathian Basin due to low fertility and high mortality rates.

REFERENCES

- Anderson, J., O'Down, L. (1999): Borders, Border Regions and Territoriality: Contradictory Meaning, Changing Significance, *Regional Studies*, Vol. 33(7), pp. 593–604.
- Baranyi Béla – Balcsók István (2004): Határ menti együttműködés és foglalkoztatás – kelet-magyarországi helyzetkép. In: *Műhelytanulmányok 2004/20*, MTA Közgazdaságtudományi Intézet, Budapest, p. 29.
- Bálint Lajos, Obádovics Csilla (2017): Belföldi vándorlás, pp: 217-236, In.: Monostori Judit - Óri Péter - Spéder Zsolt (szerk.): *Demográfiai portré 2018*, KSH NKI p. 295

- Blaskó Zs., Gödri I. (2016): A Magyarországról kivándorlók társadalmi és demográfiai összetétele. In: Blaskó Zs., Fazekas K. (szerk.): Munkaerőpiaci tükrök 2015. MTA Közgazdaság- és Regionális Tudományi Kutatóközpont Közgazdaságtudományi Intézet, Budapest, 59–68.
- Dövényi Zoltán, Tóth Pál Péter (2008): Immigration, reception and integration in Hungary, In: Szerk.: Kertész Á, Szerk.: Kovács Z Dimensions and trends in Hungarian geography: Dedicated to the 31st International Geographical Congress, Tunis, 12-15 August 2008. Budapest: Geographical Research Institute, Hungarian Academy of Sciences, 2008. pp. 111-123. (Studies in Geography in Hungary; 33.)
- Dövényi Zoltán (2011): A Magyarországot érintő nemzetközi vándorlás területi aspektusai, In: Szerk.: Tarrósy I, Szerk.: Glied V, Szerk.: Keserű Dávid Új népvándorlás: Migráció a 21. században Afrika és Európa között. Pécs: Publikon Kiadó, 2011. pp. 85–95.
- Egedy Tamás (2017): A külföldre ingázás statisztikai, demográfiai és területi jellemzői Magyarországon, Területi statisztika, 57. évfolyam 4. szám 2017. július, 385–405.
- Fercsik Rita (2008): Szülőföldről a hazába – és vissza? In: Szarka László – Kötél Emőke (szerk.): Határhelyzetek. Külhoni magyar egyetemisták peregrinus stratégiái a 21. század elején. Budapest, Balassi Intézet Márton Áron Szakkollégium. pp. 124–138.
- Gárdos Éva, Sárosi Annamária, Kincses Áron, Nagyné Forgács Eleonóra (2008): Integrated Database of International Migration Statistics with a Particular Attention to Linking Data Sources. In Hungarian Statistical Review No 12, Vol 86. pp. 75-87.
- Hansen, N. (1977): Border Regions: a Critique of Spatial Theory and an European Case Studies, Annals of Regional Science, Vol. 11, pp. 1–12.
- Illés Sándor, Kincses Áron (2009): Cirkuláció és migráció Magyarország nemzetközi vándormozgalmában. Statisztikai Szemle 87. évfolyam: (7–8. szám) pp. 729–747.
- Juhász Attila, Molnár Csaba, Zgut Edit (2017): Menekültügy és migráció Magyarországon, Heinrich-Böll-Stiftung e.V. | Prága 2017 Political Capital | Budapest 2017, ISBN: 978-80-907076-5-8, 36.
- Kapitány Balázs (2015): Külhoni magyar közösségek pp.: 227-240. In: Demográfiai portré 2015, KSH NKI p. 240.
- Karácsonyi Dávid, Kocsis Károly, Kovály Katalin, Molnár József, Póti László (2014): East–West dichotomy and political conflict in Ukraine – Was Huntington right?, Hungarian Geographical Bulletin 63 (2) (2014) 99–134. DOI: 10.15201/hungeobull.63.2.1
- Kincses Áron (2014): Nemzetközi migrációs körkép Magyarországról a 2011-es népszámlálási adatok alapján, Területi Statisztika, 54 (6) pp. 590-605.
- Kocsis Károly (2002): Etnikai földrajz. In: Tóth J. (szerk.) Általános társadalomföldrajz I., Dialóg Campus Kiadó, Budapest-Pécs,
http://www.tankonyvtar.hu/hu/tartalom/tamop425/2011_0001_528_Toht_Jozsef_Altalanos_tarsadalomfoldrajz_I_II/ch06s04.html
- Kocsis Károly (2003): A Kárpát-medence etnikai földrajza (896-1989), p. 15.
- Kocsis Károly (2015): A Kárpát-medence etnikai térképsorozata (Erdély, Szlovákia, Kárpátalja, Vajdaság, Horvátország, Muravidék, Örvidek, Magyarország), MTA Földrajztudományi Kutatóintézet, Budapest
- Kocsis Károly, Tátrai Patrik, Agárdi Norbert, Balizs Dániel, Kovács Anikó (2015): A Kárpát–Pannon-térség változó etnikai arculata a 15. század végétől a 21. század elejéig, p. 36., MTA CSFK Földrajztudományi Intézet, Budapest, 2015
http://www.mtafki.hu/konyvtar/karpat-pannon2015/pdf/Changing_Ethnic_Pattern_Carpatho_Pannonian_Area_2015.pdf
- Mezencev Kosztyantyin (2010): A területi egységek lehatárolásának tökéletesítése Ukrajnában az Európai Unió normái szerint, Területi statisztika, 13. (50.) Évfolyam 1. szám, pp. 56-66
- Rédei Mária (2007): Mozgásban a világ, a nemzetközi migráció földrajza. Eötvös Kiadó, Budapest, p. 568.

- Rédei Mária (2009): Foreigners in Budapest. In: Hungarian Statistical Review No 13, Vol 87. pp. 31–49.
- Siskáné Szilasi Beáta, Halász Levente, Gál-Szabó Lajos (2017): A magyar fiatalok erősödő kivándorlási szándékának kiváltó okai és jellemzői, *Tér és Társadalom* 31. évf., 4. szám (doi:10.17649/TET.31.4.2885), 131-147
- Soltész Béla – Erőss Ágnes – Karácsonyi Dávid – Kincses Áron (2014): Hungary: cross border migration in a fragmented ethnic space, pp. 72–87. In: Ágnes Erőss – Dávid Karácsonyi: *Discovering migration between Visegrad countries and Eastern Partners*. p. 233.
- Tóth Pál Péter (2010): A magyar népességfejlődés meghatározottsága (Múlt, jelen, jövő), pp.: 153-163, *Művelődés*, 2010/04, Kolozsvár
- Tóth Pál Péter (2018): *A Kárpát-medencei magyar népességfejlődés*, GlobeEdit, 402 p.
- Van Geenhuizen, M. – Ratti, R (2001): *Gaining Advantage from Open Borders. An active Space for Regional Development*, Ashgate, Aldershot. p. 398.

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Analysis of the expected development paths of Central-Eastern European countries between 2022 and 2025

The study attempts to determine the development paths of six Central and Eastern European countries (Bulgaria, Czech Republic, Hungary, Poland, Slovakia, Romania) for the period 2022–2025 using a time-series complex development index developed by the authors. In addition to expected economic output, the index takes into account the level of human and technical infrastructure affecting the quality of life of the population, as well as environmental impacts. The autoregressive model used in the study is a single-sector model with panel data and considers the path dependence of the projected changes and the risks from external shocks. The latter are incorporated into the projections using expert estimates. Our analyses show that, except for the Czech Republic, the members of the country group under review are mainly on diverging development paths until 2025. Only the Czech Republic is expected to converge towards the EU development path.

Key words: macro econometrics, estimation, forecast, development path, path-dependency
JEL code: R23

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1. Introduction

European economies are facing a difficult period, with the Russian-Ukrainian war disrupting the post-COVID recovery, which has and will have a serious impact on labour, energy and financial markets, supply chains and the living environment.

In our changing world, the countries of Central and Eastern Europe are in a unique position. The transformation that has taken place over the last 30 years has been beneficial for their economic growth and development. Their specific output has increased, their housing and infrastructure conditions have improved, and their income and employment figures have improved. Meanwhile, their societies have aged. However, rapid convergence towards the EU average has not been achieved. Understandably, therefore, researchers are paying increasing attention to the economic and social policy causes and consequences of this. But the governments concerned are also looking for answers to the question: what economic policy instruments can be used to speed up convergence, which has been slower than hoped for?

The study of growth and development is not new. In the 1950s, the analyses of the so-called “third-world countries” began dealing with it from several aspects (political science, world economics, etc.). International organisations (e.g., the UN, OECD, EU), governments and research institutes have taken stock of the factors determining development and the possibilities of influencing them. However, there is still no uniform methodology for measuring development (as well as economic growth), assessing, forecasting, and monitoring it.

In this paper, we seek to answer three questions:

- 1) How can territorial development be measured using a complex index (the result of aggregating indicators with different units of measurement)?
- 2) What model can be used to analyse ex-ante trends in development indicators, particularly in the current turbulent economic climate?

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3) How might the development of the six Central and Eastern European countries evolve between 2022 and 2025?

Our paper consists of three parts. In the first part we briefly summarise the methods used in short-term macroeconomic forecasting, and in the second part we present the indicators of the model we use, the methodology of the complex development index and the logical process of our forecasting. The goodness of fit of the model is tested on the 1995–2021 database. Finally, in the third section, we briefly analyse the characteristics of the baseline and risk development paths of the country group under study and compare them with the results of an earlier ex-post study.

2. Research methodology

Development and growth is an area of special importance in economics, not least because of the causal relationship between economic development and quality of life (Headey et al., 2008). It is no coincidence that the spatial development documents of the European Union and its member states pay special attention to supporting holistic development processes and monitoring the results achieved (EU, 2012; EU, 2015a; EU, 2015b; EU, 2018).

The reference to the development of national economies is common in the economics literature, despite the fact that the definition of the concept and the methodology of measuring it are far from uniform. This is confirmed by the fact that some publications still identify development with growth in gross domestic product. Other documents (e.g., the Europe 2020 strategy (EC, 2020)) aim to promote integrated growth, which is essentially a synonym for development (considering the factors that determine development, such as employment, training, energy use and innovation). The only consensus is that economic, social, and environmental indicators should be considered when measuring territorial development, but opinions differ on what these indicators should be and the methodology for integrating them (BMZ, 2012). As a result, there are several complex indicators that consider factors other than economic output (GDP). The problem is that their application is not possible in the absence of time-series data, making international comparisons difficult.

The prediction of development and of development trajectories relies on three bodies of literature that are rich in themselves. Firstly, there is development theory research, which uses empirical methods to examine the differences between developed (centre) and catching up (semi-periphery, periphery) countries (regions). Secondly, path dependence, which focuses on the impact of past events on current and future social and economic trends. Thirdly, the objective, mathematical-statistical, and econometric methods used in forecasting. In this study we cannot (for reasons of scope) undertake a detailed presentation of these, so we only highlight the relevant ideas.

The literature is far from uniform on the methodological basis and reliability of short-term forecasts. Some authors therefore question the justification of the forecasts, especially after the 2008 financial crisis. Despite the mostly justified criticisms (Heilemann, 2009; Zimmermann, 2009), however, analysts are tireless in their forecasting, not least because of the growing demand from economic and social policymakers for at least an understanding of expected trends (Koll, 2009).

Since the late 1970s, partial economic forecasts have appeared in the literature, such as for the labour market (e.g., Fehr, 2011; IAB, 2010), economic output (Kirchgässner and Savioz, 2001; Gillmann et al. 2019; Fehr, 2011; Sedillot and Pain, 2003; Mourougane, 2006), etc.) and then national economic forecasts have appeared in the literature since the late 1970s, essentially based on three methods or combinations of them.

The subjective type (e.g., Delphi method, historical analogy) relies on the knowledge and holistic approach of forecasting experts (Tiberius et al. 2022). There are time series and panel econometric methods, most of which assume an equilibrium or near-equilibrium state of the economy. Most of the models used are autoregressive (AR, ARMA, ARIMA, DSGE), i.e., they incorporate trends from the previous period (e.g., Cripps, 2014; Seto et al. 2016). They assume institutional and

systemic invariance, so that the characteristics of the future event series can be derived from a sufficiently long time-series sample, because it is assumed that the average characteristics of the previous period also hold. The path length of the event series can be substantially affected by the following factors (Ackermann, 2001; Eckey et al., 2007; Martin, 2010):

- the timeframe of the observation;
- exogenous shocks (e.g., blockade, embargo, institutional, world market, etc.) and endogenous shocks (e.g., innovation, human resource development, etc.);
- self-exciting propensity, i.e., the commitment to continue along the development paths already taken (e.g., technical, technological, organisational, etc.);
- stability in a near-equilibrium state;
- lack of capacity to change.

In addition to many benefits (e.g.: survival of values, continuation of improvements, etc.), the lock-in effect also entails risks (e.g.: perpetuation of bad practices, loss of willingness to change, inflexibility, becoming comfortable, etc.).

Prediction with evolutionary algorithms starts with several models, selects the one that produces the best results, and then combines the properties of the selected models to construct a new model whose properties can be varied randomly (heuristically) (Barto and Dietterich, 2004; Biau and D'Elia, 2010; Jung et al. 2018).

Mixed (combined) models add an expert panel to some statistical procedure to investigate changes over the time horizon under study. This method is used by the OECD (Sedillot and Pain, 2003; Mourougane, 2006) and in the Hungarian central bank's inflation forecasts (MNB, 2022).

Most models are limited in their ability to take exogenous shocks into account, or provide consistent, unbiased estimates under strong constraints (e.g., homoscedasticity, independence, zero expected error) (e.g., Fehr, 2011; Fenz and Spitzer, 2005). The methods differ not only in the time horizon over which they rely on past events, but also in their ability, if so, to deal with turbulence (e.g., financial crises, pandemic shocks, etc.) within the ex-ante time horizon under consideration (random or cyclical recurrence).

3. Forecasting model

Our model for forecasting the level of development consists of five basic steps (Figure 1):

- construction and quantification of indicators to describe development;
- determination of the estimator function and parameter estimation;
- normalisation of indicator values, quantification, and verification of sub-indices;
- determination of the time-series values of a complex index of territorial development, mapping of development paths.

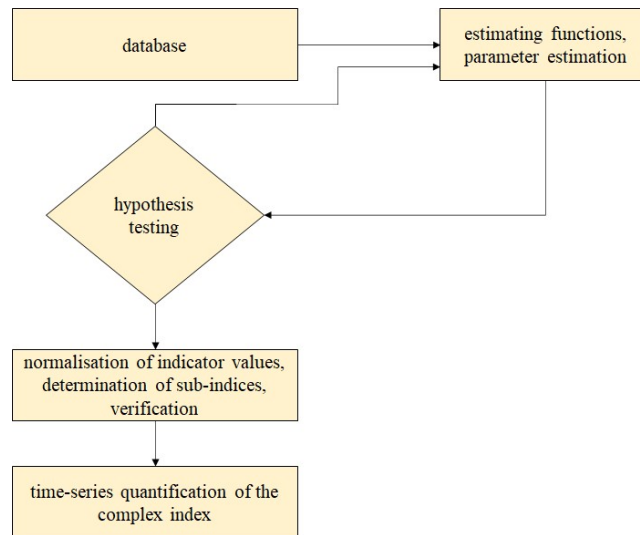


Figure 1: The logical process of forecasting
Source: own editing

In building our model, we have sought to consider the external and internal shocks to the national economy. The model is structured in five blocks (real economy, technical infrastructure, human, environmental, fiscal, and monetary) (Figure 2).

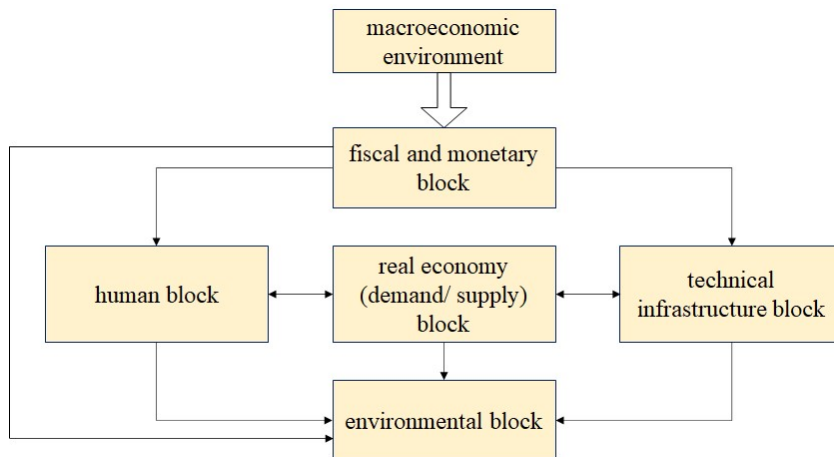


Figure 2: Structure of the forecasting model
Source: own editing

The model operates as a one-sector model, coherent with post-Keynesian economics. Accordingly, the fiscal and monetary stimulus increases output by expanding investment and consumption, improves human and technical infrastructure, and has an impact on environmental pressures.

3.1 Database of the model

Economic development means more and qualitatively different (e.g., higher education, longer life expectancy in good health, etc.) than expanding output (Kocziszky and Szendi, 2021). In other words, economic growth is an important but not sufficient condition for development (Kocziszky and Benedek, 2012). Even with rapid growth, more modest development can be achieved, or even modest output growth can induce greater improvements in quality of life (Gillmann et al. 2019). In selecting the indicators to describe development, important considerations were comparability between countries and objectivity (the data we selected are regularly published by the national statistical offices), on the one hand, and the relevance of the expected results, on the other. As different indicators can lead to distortions, the indicators were chosen on the basis that a country's development is determined by infrastructure and environmental factors in addition to economic output. Social well-being is influenced by the quality of services and the environment. The five sets of indicators (real economy, fiscal and monetary, human, technical infrastructure, state of the environment) interact with each other.

Accordingly, our database consists of 37 variables, which can be used to construct five sub-indices (economic output, fiscal and monetary situation, human, technical infrastructure, and ecological environment) (Table 1). The choice of indicators was based on international practice (mainly OECD and EU) for the most frequently monitored data, which are annual series and are available from national statistical offices and the Eurostat database.

Table 1: Indicators of the model

| block | no | indicator |
|---------------------------|-----|--|
| real economy block | 1. | GDP/capita (USD, PPS) |
| | 2. | trade balance (% of GDP) |
| | 3. | investments (% of GDP) |
| | 4. | labour productivity |
| | 5. | patent applications per 10,000 inhabitants |
| | 6. | number of active enterprises per 1000 inhabitants |
| | 7. | FDI inflow (% of GDP) |
| | 8. | activity rate (%) |
| | 9. | R&D expenditures (% of GDP) |
| | 10. | unemployment rate (%) |
| | 11. | income per household (USD, PPS) |
| | 12. | dependency ratio (share of the population aged 0–14 years/ share of the active population (15–64 years) (%)) |
| | 13. | gross average wages (USD) |
| | 14. | household consumption per capita (PPP, USD) |
| fiscal and monetary block | 15. | government debt (% of GDP) |
| | 16. | consumer price index (%) |
| | 17. | budget deficit (% of GDP) |
| | 18. | current account balance (% of GDP) |
| | 19. | long-term interest rate (%) |
| | 20. | exchange rate (%/year) |
| human block | 21. | doctors per 1000 inhabitants |
| | 22. | hospital beds per 1000 inhabitants |
| | 23. | healthcare expenditures (% of GDP) |
| | 24. | education expenditures (% of GDP) |
| | 25. | tertiary education students per 1000 inhabitants |
| | 26. | population growth (%) |

| | | |
|---------------------------------------|-----|---|
| technical infrastructure block | 27. | secondary utility gap (the gap between the ratio of dwellings connected to the public drinking water-conduit network and the ratio of dwellings connected to the public sewerage) |
| | 28. | newly built houses per 10,000 inhabitants |
| | 29. | passenger cars per 1000 inhabitants |
| | 30. | length of motorway per 100,000 inhabitants |
| | 31. | natural gas consumption per inhabitant |
| | 32. | price of gas (euro/100 m ³) |
| ecological environment block | 33. | waste generated per inhabitant (kg) |
| | 34. | greenhouse gas emissions (1990=100%) |
| | 35. | electricity consumption per person (GWh/cap) |
| | 36. | share of renewables in total energy consumption (%) |
| | 37. | price of electricity (euro/kWh) |

Source: own editing

3.2 Blocks and estimators of the model

Our model predicts single-sector, short-term (4-year time horizon) processes. Therefore, variables containing unit roots are trend filtered. Using a Hodrick-Prescott (H-P) filter, the trend was decomposed into two components, growth, and cyclical. (The smoothness parameter of H-P is defined by the ratio of the standard deviation of the cyclical and growth components $(\sqrt{\lambda^2} = \frac{\sigma_c}{\sigma_g})$.)

On this basis, $\lambda = 1600$ was chosen.)

Given that some of our indicators are expressed as a percentage of GDP, shocks may have a feedback effect on the equilibrium level of some of the variables. The data series are estimated one by one using the least squares method.

Real economy block

Output is modelled using aggregate consumption (C), investment (I) and net exports (NE) data on the consumption side.

Due to the shift in global power relations, the external trade balance is of particular importance for the group of countries under study, showing a medium-strong correlation with the number of active enterprises, labour productivity and FDI inflows. Available statistics for the real economy block show strong path dependence, both after the 2008 crisis and the 2019 pandemic. We have incorporated this observation into the macro equations for the block (Table 2).

Table 2. Macro-equations of the real economic block

| macro-equations |
|---|
| <ul style="list-style-type: none"> ▪ <i>specific output</i> = <i>constant</i> + β_1<i>aggregate consumption</i> + β_2<i>aggregate investment</i> + β_3<i>net export</i> + β_4<i>population</i> + $\varepsilon(t)$ ▪ <i>aggregate consumption</i> = <i>constant</i> + β_5<i>household income</i> + β_6<i>employment rate</i> + β_7<i>real interest rate</i> + β_8<i>budget deficit</i> + $\varepsilon(t)$ ▪ <i>aggregate investment</i> = <i>constant</i> + β_9<i>export</i> + β_{10}<i>real interest rate</i> + β_{11}<i>output gap</i> + β_{12}<i>budget deficit</i> + β_{13}<i>average exchange rate</i> + $\varepsilon(t)$ ▪ <i>aggregate net export</i> = <i>constant</i> + β_{14}<i>average exchange rate</i> + β_{15}<i>real interest rate</i> + β_{16}<i>output gap</i> + β_{17}<i>FDI</i> + $\varepsilon(t)$ |

Source: own editing

The model uses specific real output as follows: *specific real output* = *output* / (*population* * *deflator*).

Aggregate ("household" and "public") consumption is mainly influenced by family income, real interest rates, employment (Okun's law), and the age structure of the population, where

$$\text{real interest rate}(t) = \frac{1 + \text{nominal interest rate}(t)}{1 + \text{inflation rate}(t)} - 1$$

Rising real interest rates strengthen the exchange rate, reduce inflation and investment expectations, and thus labour demand. Thus, consumption and specific output are expected to be lower, as well as inflation.

The model takes aggregate investment as a function of exports, the real interest rate, the annual average exchange rate, the budget deficit, the output gap and the annual average exchange rate.

Aggregate net exports are affected by the average exchange rate, the real interest rate, and the output gap. The output gap(t) = $\overline{GDP}(t - 1) - GDP(t - 1)$ is defined as the difference between average output (\overline{GDP} – trend value of output) and actual output.

Increasing net exports tend to improve the exchange rate, reduce the real interest rate, and have a beneficial effect on the current account, ultimately on the growth of specific GDP, and through this on public investment in infrastructure, and ultimately on development.

Technical infrastructure

The quantitative and qualitative possibilities and constraints of access to infrastructure always have an impact on the development (economic output, accessibility, housing conditions, etc.) of a given region, varying from one historical period to another. The post-socialist countries under study were lagging behind the European average before 1989. It is no coincidence that, following the regime changes, governments in the region made infrastructure development a priority of economic and social policy objectives (Table 3).

Table 3. Macro-equations of the technical infrastructure block

| macro-equations |
|---|
| <ul style="list-style-type: none"> ▪ <i>passenger cars per 1000 inhabitants</i> = <i>constant</i> + β_{18}<i>household income</i> + β_{19}<i>real interest rate</i> + β_{20}<i>number of employees</i> + $\varepsilon(t)$ ▪ <i>built houses per 10,000 inhabitants</i> = <i>constant</i> + β_{21}<i>household income</i> + β_{22}<i>real interest rate</i> + β_{23}<i>employment rate</i> + β_{24}<i>population</i> + $\varepsilon(t)$ ▪ <i>length of motorway per 100,000 inhabitants</i> = <i>constant</i> + β_{25}<i>budget deficit</i> + β_{26}<i>GDP</i> + β_{27}<i>passenger cars per 1000 inhabitants</i> + $\varepsilon(t)$ ▪ <i>gas consumption per inhabitants</i> = <i>constant</i> + β_{28}<i>average price of gas</i> + β_{29}<i>household income</i> + β_{30}<i>built houses per 10,000 inhabitants</i> + β_{31}<i>GDP</i> + $\varepsilon(t)$ |

Source: own editing

In our model, the development of technical infrastructure is described by quantitative characteristics (number of cars per thousand inhabitants, number of houses per ten thousand inhabitants, and length of motorway per hundred thousand inhabitants, as well as utility supply and gas consumption).

The evolution of the number of cars per thousand inhabitants is a function of the number of employed persons, the real interest rate and household income.

In the countries of the region, the acquisition of independent house has traditionally been a major social factor expressing well-being. The destruction of residential property during the Second World War, particularly in the major cities, upset the supply and demand situation in the housing market in the longer term, creating a permanent demand market. The resulting deficit survived the post-1989 regime changes, and the frictions created by the demand market disappeared slowly over the past 30 years. The annual evolution of the number of newly built houses remains volatile for the countries under review. Analyses show that this is mainly due to the impact of household income, real interest rates, employment rates and demographic trends.

Similar considerations have led to the inclusion of the length of motorway per 100,000 inhabitants in the technical infrastructure block, which influences the development trajectory due to its spatial structure (e.g., Meinel and Reichert, 2004; Hesse et al. 1998). All the countries studied aim to close the gap in this respect mainly through public budgets. The amount of resources available depends primarily on the size of output and the budget deficit, while the demand depends on the number of cars per thousand inhabitants.

Human infrastructure

Quality of life is fundamentally influenced by the quantity and quality of human infrastructure available to the population. In line with international literature, we have included four factors in our analysis (OECD, 2014; BFS, 2022).

The role of the state in the development of human infrastructure remains crucial for the group of countries under study, i.e., the growth rate of specific GDP and the reduction in the budget deficit. The state of public education infrastructure (including the number of classrooms) influences social and economic processes through several channels (e.g., skills, willingness to work, etc.) (Peterson, 2014).

The literature confirms a clear link between health care and social and economic processes (Starfiel and Birn, 2007; Eurostat, 2017; Burla et al., 2022). Care can be analysed from the demand side on the one hand and from the supply side on the other. One indicator of access to care is the number of doctors per thousand inhabitants, which is a function of public engagement, economic activity and family income (Table 4).

Table 4. Macro-equations of the human infrastructure block

| macro-equations |
|--|
| <ul style="list-style-type: none"> ▪ <i>number of school classrooms per thousand inhabitants = constant + β_{32}education expenditures in the share of GDP + β_{33}budget deficit + $\varepsilon(t)$</i> ▪ <i>doctors per thousand inhabitants = constant + β_{34}healthcare expenditures in the share of GDP + β_{35}unemployment rate + β_{36}budget deficit + β_{37}household income + $\varepsilon(t)$</i> ▪ <i>education expenditures in the share of GDP = constant + β_{38}GDP + β_{39}budget deficit + β_{40}employment rate + $\varepsilon(t)$</i> ▪ <i>tertiary education students per thousand inhabitants = constant + β_{41}GDP + β_{42}education expenditures in the share of GDP + β_{43}employment rate + $\varepsilon(t)$</i> |

Source: own editing

The consensus in the literature is that education is a key factor in the modern economy. Therefore, there is a tendency for spending on education infrastructure to increase household incomes and ultimately the specific output of the economy, improving the level of development of a country (OECD, 2022).

The budget plays a major role in sustaining higher education. Higher levels of education and qualifications tend to support the development of a given geographical unit.

Environmental block

According to international analyses, economic output growth increases environmental pressures (waste per capita, greenhouse gas emissions) and electricity consumption per capita (Table 5).

Table 5. Macro-equations of the environmental block

| macro-equations | |
|-----------------|--|
| ▪ | <i>waste generated per inhabitant = constant + β_{44}specific output + β_{45}household income + $\varepsilon(t)$</i> |
| ▪ | <i>electricity consumption per person = constant + β_{46}specific output + β_{47}number of houses + β_{48}household income + β_{49}price of electricity + $\varepsilon(t)$</i> |
| ▪ | <i>greenhouse gas emmissions = constant + β_{50}specific output + β_{51}household income + β_{52}number of active enterprises + β_{53}population + $\varepsilon(t)$</i> |
| ▪ | <i>share of renewables in total energy consumption = constant + β_{54}specific output + β_{55}household income + $\varepsilon(t)$</i> |

Source: own editing

The amount of solid waste generated depends to a large extent on the output of the economy, income levels and the quality of life.

The amount of electricity used is determined by the specific output of the economy, the price of electricity, the income of households and the number of houses.

When projecting greenhouse gas emissions, the literature generally considers income, GDP forecasts and economic activity in addition to expected population (ITM, 2020).

Fiscal and monetary block

The model considers five exogenous indicators (public debt, inflation, current account balance, central bank base rate, budget deficit), whose ex-post values are based on Eurostat data and ex-ante values on expert estimates.

Public debt (% of GDP): An increase in the budget deficit has a long-term downward effect on investment and, through it, on economic output, which increases public debt and reduces growth potential.

Rising inflation has a negative impact on real GDP, ceteris paribus on family incomes, and can affect the base rate of the central bank and through it the interest rate on commercial loans, which can reduce the willingness to invest, and thus ultimately have a negative impact on development. The current account balance, which is influenced by the size of net exports and specific output, and through this the range of tasks that can be supported by the state, ultimately has an impact on development.

The size of the base rate, its trend of change, is influenced by the cyclical position of the economy, the level of inflation and the state of financial stability. A falling base rate supports the rise in the level of development through consumption and investment.

Inflation improves the fiscal deficit in the short run, but has a high social cost, and thus ultimately has a negative impact on development.

3.3 Sub-indices and the logic for determining the composite index

The indices have a benchmark role; the changes in their values can be used to characterise the change in the development of a given region over time, with growth relative to the base period indicating progress, decline representing a decline, and stagnation indicating stability.

The data of the indicators in our database have been transformed into a time-series ratio scale from 0 to 100, using the distance to frontier (DTF) normalisation method. For a given indicator, the best performing country received 100 points, while the other countries ranked lower depending on the size of their gap from the best performing country. (Only countries at least 4 standard deviations from the best performing country can receive 0 points.) The correlation used to convert the baseline indicators into scores is the following (when the higher value of the indicator is the more favourable (e.g., output, employment, etc.)):

$$x_{norm} = \frac{x_i - x_{min}}{x_{max} - x_{min}} * 100 ,$$

and if the higher value of the indicator is unfavourable (e.g., environmental pressures, unemployment, etc.):

$$x_{norm} = \frac{x_i - x_{max}}{x_{min} - x_{max}} * 100 ,$$

where x_{max} is the maximum among the values in the study area, and x_{min} is the minimum among values. The advantage of this methodology is that it does not require a normal distribution of the raw data. The scoring follows the dispersion of the values of the areas in the sample and allows the value considered to be optimal to vary from indicator to indicator. Thus, for each indicator it can be decided individually whether its minimum, maximum or even sample average value should be optimal.

Based on the ratio scale values of the indicators belonging to the same group, four sub-indices (economic output, human infrastructure, technical infrastructure, ecological situation) were defined by arithmetic averaging, i.e.:

$$SI_j = \left(\sum_{i=1}^n x_{norm} \right) / n_i$$

$$CI_j = \frac{(\sum_{j=1}^m SI_j)}{m} ,$$

where SI_j is the sub-index of block j, CI is the complex index.

3.4 Ex-post testing of the model

Our model was tested using the 1995–2021 dataset of the group of countries under study. The comparison of the development indices of the country group estimated by the econometric model (\hat{I}_i) and those determined from the actual data (I_i) was determined by the mean percentage error (MAPE), which defines the deviations in percentage form.

$$MAPE = \left(\frac{1}{n} \sum_{t=1}^n \left| \frac{I_t - \hat{I}_t}{I_t} \right| \right) * 100$$

Our calculations show that the function approximates the ex-post values of the database well (Table 6).

Table 6. Difference between estimated and actual indices (MAPE, %)

| MAPE/country | Bulgaria | Czechia | Hungary | Poland | Romania | Slovakia |
|----------------------------------|----------|---------|---------|--------|---------|----------|
| real economy sub-index | 0.37 | 0.06 | 0.09 | 0.17 | 0.03 | 0.04 |
| human sub-index | 1.01 | -0.75 | 1.03 | 2.66 | 0.08 | 1.17 |
| infrastructural sub-index | 0.92 | 4.06 | 2.17 | 2.21 | 0.65 | -0.92 |
| ecological sub-index | 1.68 | 5.68 | 2.72 | 5.58 | 1.83 | -1.09 |
| aggregate index | 0.84 | 1.35 | 0.87 | 2.58 | 0.71 | -0.38 |

Source: own editing

4. Forecasting results

Our ex-ante analysis was based on the econometric model presented above. The shock after 2022 was considered by an expert panel. Shocks, as the literature shows, are of limited duration, due to fiscal and monetary interventions on the one hand, and the persistence of consumption at the expense of household savings on the other (according to Heilemann (2019), analysis of crises in the FRG between 1966 and 2013 shows that, for example, the average recovery period was 3.1 quarters). Recovery begins thereafter. In most cases, however, this leads to a lower path than before.

Changes in energy and commodity prices, embargoes, etc. are represented by changes in inflation, budget deficits and public debt. Given the fact that these data are given with a year-to-date impact, the panel is also suitable for incorporating downside and upside risk paths.

The expert panel identified four risks over the forecast horizon:

- Geopolitical risks, which have an impact through several channels at the same time (natural gas, oil, commodity price increases), especially in the case of the CEECs (Central Eastern European Countries) neighbouring the war zone;
- Increasing budget deficits due to the wave of refugees resulting from the war;
- Increases in public debt;
- Global economic slowdown, rising inflationary pressures, tightening monetary policy behaviour of central banks.

In our model, the inflation rate, the size of public debt and the budget deficit are determined by the central banks of the countries concerned and by expert consultations.

Key findings of the expert panel: Due to the Russian-Ukrainian war and poor weather conditions, inflation will increase at different rates for the group of countries from 2022 onwards. Over the time horizon under consideration, inflationary pressures are expected to ease only from 2024 onwards (Table 7). The rise in inflation has brought an increase in central bank base rates, which has led to a decline in trade loans (and hence in investment willingness) and consumption. The Hungarian economy is particularly affected by this over the forecast horizon due to the high inflation outlook.

Table 7. Expected change in inflation rate (%) in the countries under review (year/year)

| country | inflation (%) | | | |
|-----------------------|---------------|-----------|----------|---------|
| | 2022 | 2023 | 2024 | 2025 |
| Hungary | 18.7 | 9.0–11.5 | 5.0–7.5 | 3.5–4.5 |
| Poland | 14.2 | 12.3–14.0 | 6.2–7.0 | 3.5–4.2 |
| Bulgaria | 18.7 | 14.0–15.0 | 6.3–6.5 | 5.3–5.5 |
| Romania | 16.3 | 10.5–11.5 | 5.0–5.3 | 4.3–4.9 |
| Czech Republic | 9.8 | 10.5–11.0 | 9.5–10.9 | 8.6–9.0 |
| Slovakia | 15.6 | 9.6–10.5 | 7.0–7.4 | 6.9–7.5 |

Source: expert forecast based on documents from the central banks of the countries concerned

A similar, but more moderate, negative trend is expected for the government debt (Table 9) and the budget deficit (Table 8).

The balance sheet indicators for the group of countries under review worsen (to varying degrees, however) from 2022 onwards. The main reason is a further increase in energy and commodity prices. Balance of payments deficits (especially in Hungary, Romania, and Slovakia) are accompanied by an unfavourable financing structure: high deficits will be financed by increasing debt inflows. In the Czech Republic and Poland, financing needs may be financed by non-debt sources (net FDI) as well as debt (Table 8).

Table 8. Budget deficit projections (% of GDP)

| country | budget deficit | | | |
|-----------------------|----------------|---------|---------|---------|
| | 2022 | 2023 | 2024 | 2025 |
| Hungary | 8.0 | 6.9–7.2 | 4.9–5.5 | 4.0–4.3 |
| Poland | 4.3 | 4.9–5.8 | 5.8–6.2 | 5.3–6.0 |
| Bulgaria | 4.2 | 5.1–5.4 | 5.9–6.2 | 4.9–5.0 |
| Romania | 6.72 | 6.4–7.1 | 7.0–7.2 | 6.5–7.0 |
| Czech Republic | 8.5 | 6.1–6.8 | 6.8–7.2 | 6.3–6.6 |
| Slovakia | 6.5 | 4.9–5.5 | 6.0–6.1 | 5.3–5.8 |

Source: expert forecast based on documents from the central banks of the countries concerned

The equilibrium position of the economies under review is expected to reach its minimum in 2023, after which a slow improvement will be observed. The main risk to fiscal balances is related to changes in energy prices.

The gross government debt-to-GDP ratio of the countries decreases in line with the decline in the budget deficit over the period under review (Table 9).

Table 9. Government debt projections (% of GDP)

| country | government debt | | | |
|-----------------------|-----------------|-----------|-----------|------|
| | 2022 | 2023 | 2024 | 2025 |
| Hungary | 76.8 | 77.1–79.0 | 79.9 | 76.2 |
| Poland | 53.8 | 55.1–58.2 | 60.2 | 60.1 |
| Bulgaria | 52.7 | 54.0–56.8 | 40.1–49.1 | 32.1 |
| Romania | 48.8 | 54.9–59.2 | 58.3 | 60.3 |
| Czech Republic | 41.9 | 47.1–51.2 | 50.8 | 52.1 |
| Slovakia | 63.1 | 59.0–61.0 | 63.2 | 68.2 |
| EU | 88.1 | 90.1–92.4 | 92.8 | 91.6 |

Source: expert forecast based on documents from the central banks of the countries concerned

We forecast a rapid recovery in the real economy, driven by interest rate increases in the countries involved, which will have a positive impact on technical infrastructure. At the same time, the labour market will not experience a significant drop in employment, while a greater focus will be placed on greening economies.

The baseline path is set at the median of the experts' estimates for 2023–2025 (Figure 3), from which the risk paths deviate symmetrically by 8–10% up and down.

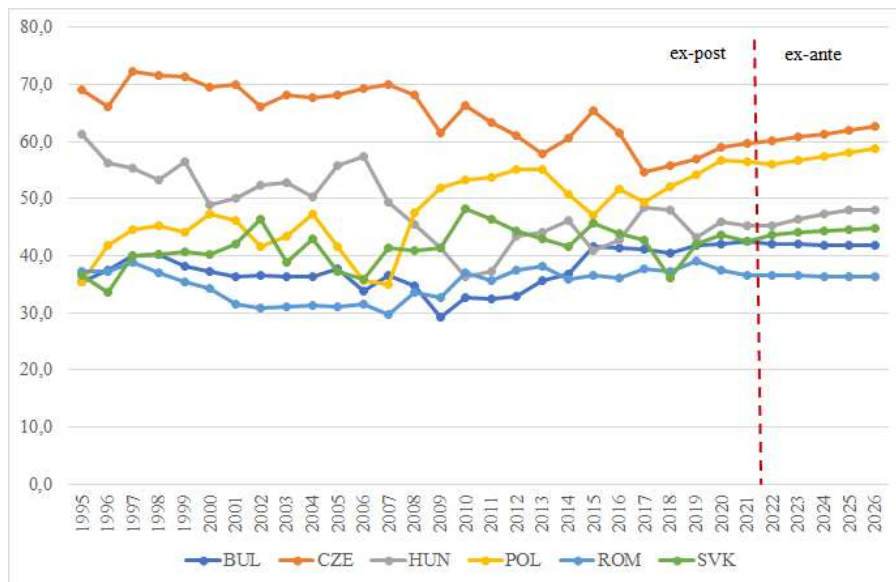


Figure 3: Development paths of the countries in the region

Source: own editing

The development paths of the region under study are converging. Bulgaria and Romania are expected to show a slow down in their catching-up, mainly for infrastructure and environmental reasons (Table 10).

Table 10. Expected trends in development paths (2022–2025)

| country | equation | R ² |
|-----------------------|-----------------------|----------------|
| Bulgaria | $y = -0.06x + 42.12$ | 69.23 |
| Czech Republic | $y = 0.605x + 59.537$ | 99.35 |
| Hungary | $y = 0.708x + 44.876$ | 90.73 |
| Poland | $y = 0.659x + 55.417$ | 99.75 |
| Romania | $y = -0.03x + 36.53$ | 75.0 |
| Slovakia | $y = 0.255x + 43.533$ | 96.38 |

Source: own editing

In our model, this problem was addressed by using a range of forecasts for the expected path of the inflation rate, the budget deficit and public debt. The risks were considered to be bidirectional (upside and downside). Thus, we obtained different (fan) trajectories from the baseline.

5. Summary

Over the past 50 years (especially after 2008), the reliability of economic forecasts has been criticised, mainly because they have failed to predict imbalances and the resulting economic crises.

Clearly, there is no such thing as a ‘pinpoint’ economic forecast. For some time, we should expect the forecasts to give conditional results.

For economic policymakers, despite the criticisms, it is essential to know the expected trajectories of future social and economic processes and how they can be influenced, even if their accuracy is debatable. It is therefore more important to understand expected trends rather than point-in-time outcomes. This can indicate and signal the direction of intervention and the consequences of its impact.

The model presented in our study allows for a short-term, ex-ante study of the economic, human, technical infrastructure and environmental conditions affecting development. Estimates of expected inflation, public debt, exchange rate, budget deficit and energy prices improve the analytical power of the model results.

Our preliminary research shows that the initial (1995–2021) development trajectories of the countries in the region were still determined by the shocks of the transition period that started after 1990 (privatisation, sectoral decline, widening social disparities, etc.), which is reflected in the substantial differences in their development paths. The reasons for this were, on the one hand, public expectations in terms of social and welfare provision and, on the other, economic policy. This is supported by our ex-post analysis. The inflationary pressures resulting from the pandemic in 2020 and the Russian-Ukrainian war from 2022, and the resulting inflationary pressures, will have a negative impact on the real economies of all countries in the region, and on the development of closely related infrastructure and ecological indicators, to varying degrees. This also causes a break in the trend of their aggregate development indices. According to our current model calculations, forward movement of the economy is mainly driven by inflationary pressures, changes in fiscal and monetary indicators in line with inflation, and, on this basis, public and private sector investment. Our calculations show that for countries with low investment rates (below 18%), it is not possible to expect a meaningful change in development levels. Sustaining high investment expansion rates can be supported by EU funds on the one hand and foreign working capital on the other. At the same time, investment in the real economy should not increase the specific ecological burden (energy demand, environmental damage). Once the trend returns to normal (this is expected to take 2–3 years), the development paths of the Czech Republic and Poland are expected to return to their original trend, while for Romania, Bulgaria, Hungary and Slovakia it is expected to take longer.

List of references

- ACKERMANN, R. (2001): *Pfadabhängigkeit, Institutionen und Regelkonform*. Mohr Siebeck, Tübingen.
- BARTO, A. – DIETTERICH, T. G. (2004): *Reinforcement Learning and its Relationship to Supervised Learning*. Handbook of Learning and Approximate Dynamic Programming, pp. 47-64.
- BERNDT, E. R. (1991): *The Practice of Econometrics: Classic and Contemporary*. Addison Wesley, Reading.
- BFS (2022): *Indikatoren der Lebensqualität*. Bundesamt für Statistik. bfs.admin.ch/bfs/de
- BIAU, O. – D’ELIA, A. (2010): *Euro Area GDP Forecasting Using Large Survey Datasets: A Random Forest Approach*. Euro indicators Working Papers.
- BMZ (2012): *Territoriale Entwicklung im ländlichen Raum*. Bundesministerium für wirtschaftliche Zusammenarbeit. Berlin.
- BURLA, L. – WIDMER, M. – ZEITNER, C. (2022): *Zukünftiger Bestand und Bedarf an Fachärztinnen und -ärzten in der Schweiz*. OBSAN Bericht, Neuchâtel.
- CRIPPS, F. (2014): *Macro-model scenarios and implications for European policy*. in Eatwell, John, Terry McKinley, and Pascal Petit, eds. *Challenges for Europe in the World of 2030*. Farnham, Surrey: Ashgate Publishing.

- EC (2020): Handbook of Territorial and Local Development Strategies. European Commission, Brussels.
- ECKEY, H. F. – SCHWENGLER, B. – TÜRCK, M. (2007): *Vergleich von deutschen Arbeitsmarktreionen*. IAB-Discussion Paper, No. 3/2007.
- EU (2012): Europäische Erhebung zur Lebensqualität (EQLS). European Foundation for the Improvement of Living and Working Conditions. <https://www.eurofound.europa.eu/de/surveys/european-quality-of-life-surveys>
- EU (2015a): Agenda 2000. Eine stärkere und erweiterte Union. <https://eur-lex.europa.eu/DE/legal-content/summary/agenda-2000-for-a-stronger-and-wider-union.html>
- EU (2015b): Politische Strategien für ein besseres Leben. https://www.europarl.europa.eu/summits/lis1_de.htm
- EU (2018): Die 28 Mitgliedstaaten der EU. Brüssel. https://european-union.europa.eu/principles-countries-history/country-profiles_de
- EUROSTAT (2017): *Statistiken zur Gesundheitsversorgung*. 29. June 2017.
- FEHR, H. (2011): *Berechnungen des langfristigen Produktionspotenzials unter Berücksichtigung verschiedener altersbedingter und bildungsspezifischer Produktivitätsprofile*. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, Wiesbaden, Arbeitspapier Nr. 02.
- FENZ, G. – SPITZER, M. (2005): *AQM: The Austrian Quarterly Model of the Oesterreichische Nationalbank*. Working Papers 104. Österreichische Nationalbank, Wien.
- GILLMANN, N. – LEHMANN, R. – NAUERTH, J. A. – PONATTU, D. – RAGNITZ, J. – SONNENBURG, J. – WEBER, M. (2019): *Wachstum und Produktivität 2035*. ifo Institut, Dresden Studien, Nr. 84.
- HEADEY, B. – MUFFELS, R. – WOODEN, M. (2008): Wealth and happiness revisited – growing national income does go with greater happiness. *Social Indicators Research*, 64, pp. 1-27.
- HEILEMANN, U. (2009): Déja Vu: Prognose in der Krise. Wirtschaftsdienst, Nr. 2, pp. 90-95.
- HEILEMANN, U. (2019): Rezessionen in der Bundesrepublik Deutschland von 1966 bis 2013. Wirtschaftsdienst, Nr. 8, pp. 546-551.
- HESSE, M. – MEYERHOFF, J. – PETSCHOW, U. (1998): *Verkehrsinfrastrukturen und wirtschaftliche Entwicklung*. Institut für ökologische Wirtschaftsforschung, Berlin.
- IAB (2010): *Regionale Arbeitsmarktpagnosen der Arbeitslosen und sozialversicherungspflichtig Beschäftigten*. Nr. 2, Nürnberg.
- ITM (2020): *Nemzeti energia- és klímaterv*. Innovációs és Technológiai Minisztérium, Budapest.
- JUNG, J. K. – PATNAM, M. – TER-MARTIROSYAN, A. (2018): *An Algorithmic Crystal Ball: Forecasts-based on Machine Learning*. IMF Working Paper No. 2018/230, pp. 1-33.
- KIRCHGÄSSNER, G. – SAVIOZ, M. (2001): Monetary Policy and Forecasts for Real GDP Growth. *German Economic Review*. 2 (4), pp. 339-365.
- KOCZISZKY, GY. – BENEDEK, J. (2012): Contributions to the issues of regional economic growth and equilibrium as well as the regional policy. *Hungarian Geographical Bulletin* 61 (2): 113-130.
- KOCZISZKY, GY. – SZENDI, D. (2021): Comparative Analysis of the Economic Development Paths of Hungarian Counties. *PUBLIC FINANCE QUARTERLY* 66 : Special edition, 2021/2, pp. 7-30.
- KOLL, W. (2009): Welche Rolle spielen Prognosen? Wirtschaftsdienst, Nr. 2. pp. 79-86.
- KUMAR, S. M. – WOO, J. (2010): *Public Debt and Growth*. IMF Working Paper. WP/10/174.
- MARTIN, R. (2010): Roepke Lecture in Economic Geography - Rethinking Regional Path Dependence: Beyond Lock-in to Evolution. *Economic Geography*, 86: 1-27. <https://doi.org/10.1111/j.1944-8287.2009.01056.x>

- MEINEL, G. – REICHERT, S. (2004): *Flächenwirkung des deutschen Autobahnnetzes – Konzept und erste Ergebnisse einer GIS-gestützten Analyse*. Deutschen Gesellschaft für Photogrammetrie, Band 13. pp. 227-234.
- MNB (2022): *Inflation Report*. Magyar Nemzeti Bank, Budapest.
- MOUROUGANE, A. (2006): *Forecasting Monthly GDP for Canada*. OECD Economics Department Working Papers, No. 515.
- OECD (2014): *How's Life in Your Region? Measuring Regional and Local Well-being for Policy Making*. OECD Publishing, Paris.
- OECD (2022): *Economic Outlook*. (www.oecd.org/economic-outlook/november-2022)
- PETERSON, J. S. (2014): *Review of Research at Virginia Tech on the Relationship between School Building Condition and Student and Teacher Performance and Attitudes*. PhD dissertation. Virginia Polytechnic Institute and State University. https://vtechworks.lib.vt.edu/bitstream/handle/10919/56836/Peterson_JS_D_2014.pdf?isAllowed=y&sequence=1 (letöltés ideje: 2022. november 10.).
- POTRAFKE, N. – GRÜNDLER, K. – MOSLER, M. – DÖRR, L. (2019): *Der Zusammenhang zwischen Verschuldung, Budgetzusammensetzung und volkswirtschaftlichem Wachstum*. ifo Forschungs-Berichte, 107/2019. München.
- SEDILLOT, F. – PAIN, N. (2003): *Indicator Models of Real GDP Growth in Selected OECD Countries*. OECD Economics Department Working Papers, No. 364.
- SETO, K. C. – DAVIS, S. J. – MITCHELL, R. B. – STOKES, E. C. – UNRUH, G. – ÜRGE-VORSATZ, D. (2016): Carbon Lock-In: Types, Causes, and Policy Implications. *Annual Review of Environment and Resources*, 2016 41 (1), pp. 425-452.
- STARFIELD, B. – BIRN, A. E. (2007): Income redistribution is not enough: income inequality, social welfare programs, and achieving equity in health. *J Epidemiol Community Health*, 61 (12), pp. 1038-1041.
- TIBERIUS, V. – GOJOWY, R. – DABIC, M. (2022): Forecasting the future of robo advisory: A three-stage Delphi study on economic, technological, and societal implications. *Technological Forecasting and Social Change*. 182.
- ZIMMERMANN, K. F. (2009): Prognosekriese: Warum weniger manchmal mehr ist. *Wirtschaftsdienst*, Nr. 2, pp. 86-90.

Annex 1. Average and standard deviation of the indicators

| block | nr. | indicator | EU average (2020) | sigma EU (st. dev.) (2020) | six countries average (2020) | sigma six countries (st. dev.) (2020) |
|--------------------------------|-----|---|-------------------|----------------------------|------------------------------|---------------------------------------|
| real economy block | 1. | GDP/capita (USD, PPS) | 44765.8 | 18917.3 | 33048.3 | 5102.7 |
| | 2. | trade balance (% of GDP) | 85.6 | 10.1 | 126.0 | 31.4 |
| | 3. | investments (% of GDP) | 21.9 | 5.2 | 22.1 | 3.8 |
| | 4. | labour productivity | 88559.5 | 15647.1 | 22261.2 | 5172.8 |
| | 5. | patent applications per 10000 inhabitants | 1.17 | 0.3 | 0.5 | 0.2 |
| | 6. | number of active enterprises per 1000 inhabitants | 52.2 | 29.4 | 93.3 | 35.1 |
| | 7. | FDI inflow (% of GDP) | 0.7 | 4.9 | 1.6 | 1.8 |
| | 8. | activity rate (%) | 73.0 | 3.1 | 74.2 | 2.8 |
| | 9. | R&D expenditures (% of GDP) | 74.7 | 4.7 | 72.3 | 2.2 |
| | 10. | unemployment rate (%) | 7.4 | 3.2 | 4.5 | 1.3 |
| | 11. | income per household (USD. PPS) | 22364.0 | 7636.1 | 11975.0 | 2500.6 |
| | 12. | dependency ratio (share of the population aged 0-14 years/ share of the active population (15-64 years) (%)) | 23.5 | 1.0 | 23.4 | 0.9 |
| | 13. | gross average wages (USD) | 2793.5 | 649.3 | 1267.8 | 245.1 |
| | 14. | household consumption per capita (PPP. USD) | 16360.0 | 1976.1 | 15640.7 | 1691.3 |
| | 15. | government debt (% of GDP) | 436 | 7.4 | 15.4 | 0.4 |
| fiscal and monetary block | 16. | consumer price index (%) | 90.1 | 43.9 | 51.6 | 17.9 |
| | 17. | budget deficit (% of GDP) | 0.5 | 5.1 | 2.6 | 0.8 |
| | 18. | current account balance (% of GDP) | -6.9 | 2.6 | -6.7 | 2.1 |
| | 19. | long-term interest rate (%) | 3.0 | 4.4 | 0.1 | 3.0 |
| | 20. | exchange rate (%/year) | 0.39 | 1.9 | 1.8 | 1.4 |
| | 21. | doctors per 1000 inhabitants | 1 | 0 | 15.0 | 9.84 |
| human infrastructure block | 22. | hospital beds per 1000 inhabitants | 2.2 | 1.7 | 34.4 | 7.0 |
| | 23. | healthcare expenditures (% of GDP) | 5.2 | 1.3 | 67.7 | 6.0 |
| | 24. | education expenditures (% of GDP) | 7.7 | 2.2 | 4.9 | 0.8 |
| | 25. | tertiary education students per 1000 inhabitants (head) | 4.8 | 1.4 | 4.2 | 0.5 |
| | 26. | population growth (%) | 39.3 | 10.7 | 30.4 | 3.7 |
| technical infrastructure block | 27. | secondary utility gap (the gap between the ratio of dwellings connected to the public drinking water-conduit network and the ratio of dwellings connected to the public sewerage) | 0.1 | 20.8 | 11.2 | 3.2 |
| | 28. | built houses per 10000 inhabitants | 53.2 | 36.3 | 41.5 | 12.5 |
| | 29. | passenger cars per 1000 inhabitants | 560 | 110.4 | 478.7 | 102.2 |
| | 30. | length of motorway per 100000 inhabitants | 30.7 | 12.6 | 10.1 | 4.7 |
| | 31. | gas consumption per inhabitants | 806.1 | 469.2 | 740.1 | 219.1 |
| | 32. | price of gas (euro/100m ³) | 5.1 | 0.74 | 4.2 | 0.95 |
| environmental block | 33. | waste generated per 1 inhabitant (kg) | 505.0 | 102.6 | 392.5 | 70.1 |
| | 34. | greenhouse gas emissions (1990=100%) | 79.3 | 21.3 | 63.9 | 12.4 |
| | 35. | electricity consumption per person (GWh/cap) | 5.5 | 0.7 | 4.3 | 0.9 |
| | 36. | share of renewables in total energy consumption (%) | 22.0 | 11.7 | 18.7 | 3.8 |
| | 37. | price of electricity (euro/kWh) | 0.213 | 0.014 | 0.141 | 0.031 |

Source: own editing

Péter Somos¹¹ – Miklós Lukovics¹²

Investigating the Public Acceptance of Autonomous Delivery Vehicles in Hungary

The technological advancement of autonomous vehicles has accelerated in recent days: the number of street tests conducted in the daily traffic of cities is increasing dynamically, and so are the numbers of cities involved, participating developers, and tested vehicles. It can also be observed that not only self-driving cars are being tested on the street now; self-driving buses and trucks are also appearing on public roads, and on the pavements a lesser-known type of vehicle can be found, the so-called autonomous city delivery robots. There are several international studies on the social acceptance of self-driving vehicles, but the vast majority of them focus on self-driving cars. We have little information about how the urban population relates to autonomous delivery robots, which travel on the pavement and can come into much more direct contact with residents than their counterparts that travel on the road or in the air. Our study, by means of netnography and questionnaire research, as well as motion picture sentiment research, analyses Hungarian society's attitude towards self-driving transport vehicles.

Keywords: autonomous delivery robots, last-mile delivery, city logistics, urban traffic
JEL: O32, O33, Q55

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1. Introduction

Emerging technologies can have a major impact on the development of cities (Szendi et al., 2022; Gábor, 2022). A dynamically increasing number of autonomous vehicles are present on the streets of more and more cities under the banner of more and more development companies worldwide: in California in 2022, the vehicles travelled 9.2 million kilometers miles, which was 1.6 million kilometers more compared to the base period (2021), in autonomous mode with 28% more test vehicles with a decreasing need for human intervention (DMV, 2023). Nevertheless, making self-driving technology widespread not only requires the maturity of the technology, but also, among others, the acceptance of society (KPMG, 2021).

The results of several social science research studies show how the population relates to self-driving vehicles: the public is characterized by a positive anticipation towards the emergence of self-driving cars; however, this is surrounded by considerable anxiety, concern and uncertainty (Moták et al., 2017; Koul and Eydgahi, 2018; Müller, 2019; Baccarella et al., 2020). Hutchins and Hook (2017) found that the majority of respondents expressed concerns about autonomous vehicles; furthermore, they questioned the safety of the vehicles and viewed the issue of legal and regulatory responsibility with mistrust. Liljamo et al. (2018) and Havlíčková et al. (2019) identified groups with more negative opinions: women, the elderly, inhabitants of rural regions and people having lower levels of education.

An increasing quantity of research results are being presented in social science issues regarding self-driving vehicles in Hungary, as well. Hungarian researchers have studied self-driving cars in terms of moral questions (Miskolczi et al., 2021), legal questions (Ambrus, 2019; Kecskés, 2020), relationship with responsible innovation (Lukovics et al., 2018), effect on government budget and employment (Gyimesi, 2019), effect on lifestyle and economy (Banyár, 2019), relationship with cities (Lados and Tóth, 2019; Smahó, 2021), and social impact and acceptance (Madarász and

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Szikora, 2018; Majó-Petri and Huszár, 2020; Csizmadia, 2021; Páhy, 2021; Kovács and Lukovics, 2022; Nagy et al., 2022; Palatinus et al., 2022; Prónay et al., 2022.; Hőgye-Nagy et al., 2023).

It can be observed that the vast majority of research either addresses the subject of autonomous vehicles in general without vehicle type specification or focuses exclusively on self-driving cars. At the same time, information is scarce on how the public relates to autonomous trucks, buses, drones or small-sized (about 1 meter square) autonomous delivery robots. The latter case is special because certain types travel on the pavement, thus they can come into much more direct contact with people than versions travelling in the air or on the road, and therefore, their technology acceptance may differ as well.

Based on the above, our research aims to assess the attitude of the Hungarian population towards autonomous delivery robots and to identify the factors influencing technology acceptance. Due to the specialty of the topic, we followed a multi-stage research design: first we conducted netnography research, which provided a direct picture about the emerging attitudes. Based on this we searched for group-level connections between individual attitudes. It was followed by a questionnaire survey, which aimed to examine the relationship between a person's demographic and lifestyle characteristics and attitudes. The effect of stimuli on acceptance was studied in motion picture sentiment research, where the subjects watched a video about robots in various situations, followed by an interview about the experience material and its effect on their opinion about delivery robots.

2.About the nature and significance of autonomous delivery robots

Before we study the relationship of autonomous delivery robots and society, it is important to look at the environment that triggered the creation of the technology in question and in which it is applied (Pettigrew et al., 2018; Hajdú, 2020; Zhu et al., 2022). Delivery robots work in freight transport, more specifically, in the area of last-mile delivery, which refers to the last stage of the delivery chain, carrying the package to the customer (Boysen et al., 2020).

The question of why this segment needs urgent reforms can be answered if we look at online purchasing habits – the number of packages to be delivered has multiplied over a few years, thereby increasing the volume of the vehicle traffic needed for delivery. This is largely attributed to changed shopping habits due to the COVID pandemic (Lipták, 2022; Lipták and Musinszki, 2022). The emissions generated by the vehicles used for last-mile delivery enormously exceed the allowable value (Figliozzi et al., 2020).

2.1.The explosion of electronic commerce and last-mile freight traffic

Despite the fact that customers are offered increasingly convenient solutions and extending business opportunities affect logistics service providers positively, home delivery involves high social costs due to the growing number of transport vehicles (Kapser –andAbdelrahman, 2020). These negative effects appear both in the quality of life provided by urban regions and in the economic competitiveness of these areas, in addition to the deterioration of general road safety. Overall, current transport practices do not seem to be compatible with this extremely swiftly changing segment (Peppel et al., 2022).

Janebäck and Kristiansson (2019) claim that with the rapid advancement of products and services most sectors enter new territories, whether it is artificial intelligence, digitalization, mobilization, or the redistribution of the market. Logistics is a good example for this, both growing and developing. The swift expansion of electronic commerce forces the stakeholders in the above-mentioned market segment to provide quicker and simpler services in compliance with increasing demands and needs. Accordingly, many pick-up points have been set up in city centres and rural regions, and the network of parcel terminals offering a 24/7 collection option has also expanded. Nevertheless, last-mile delivery is still considered an unresolved issue. As in the case of restructuring the delivery system, both public service and private parties take advantage of the

successful targeting of customers, and in an ideal case, the public and the private sector may establish a cooperation, which could help maximize the benefit from new initiatives, emerging technologies and methods related to mobility and delivery (Caspersen and Navrud, 2021).

2.2. Autonomous delivery robots

The increased demand for just-in-time deliveries is a logistics challenge that service providers still cannot manage in a way that it meets the environmental and economic(al) expectations (Figliozi et al., 2020). This gap can be filled by autonomous delivery robots, which are electric motor-driven self-driving vehicles able to transport and deliver parcels without the intervention of a human courier (Figliozi, 2020). Autonomous delivery robots can be categorized into several different types. There are pedestrian-sized robots travelling on pavements, car-like models participating in road traffic and flying drones (Figliozi, 2020, 2017).

Electric light trucks can already be considered well-established and tested tools when addressing delivery issues (Garus et al. 2022). The main related drawback is a high cost of capital, which is currently an obstacle for delivery companies. This kind of entry barrier may be eliminated by robot-based delivery, where besides lower power consumption, the investment cost is a fraction of the amount needed to invest in larger vehicles, while emissions are also reduced by this scenario. At the same time, robots entail limitations such decreasing the maximum size and weight of parcels and uncertainties in terms of traffic and technology.

Given that delivery robots can only be used for delivering smaller-sized parcels due to their size, Lemardelé and Estrada (2021) studied the idea of a dual delivery system applying both traditional vehicles and robots depending on the size of the parcel. Garus et al. (2022) would also combine the robot-based system with another technology to fully supply the demand, concluding that the system set up together with diesel vans seems efficient. Another possibility alongside robot-based delivery is to establish pick-up points for the parcels which are not compatible with the capacity of robots. A further dual delivery concept is a possible extension of the system of pedestrian delivery robots supported by a carrier van, where the van not only transports the robots, but also participates in parcel delivery, carrying the packages that are too bulky for the robots in the first place (Heimfarth et al., 2022).

Delivery systems via delivery robots can be beneficial for consumers, the owners of delivery companies and the community (Lyon-Hill et al. 2020). Consumers receive faster delivery for their money, business owners can be pleased with increasing sales and customer attainment, and for the society decreasing vehicle traffic, carbon dioxide emissions and greater access to products mean an improvement in the quality of life.

3. Scientific literature background of the social acceptance of autonomous delivery robots

In order to investigate human relation to delivery robots, we need to scrutinize the circumstances of the human-robot encounter and identify the factors affecting our emerging feelings (Venkatesh et al., 2012; Hudik et al., 2022; Dimitropoulos and Panagiotopoulos, 2018; Kovács and Lukovics, 2022). The trust towards a robot depends on, among others, the physical distance between the individual and the vehicle, the level of convenience felt around the robot, and also the amount of prior knowledge and information about it (Matthews et al., 2017). A targeted communication system can be a solution for critical situations, facilitating pedestrian-robot interaction, thereby increasing comfort when encountering robots.

De Groot (2019) outlines three scenarios representing the three grades of the acceptance-rejection scale. Ideally, the attitude is so positive that human cooperation entails physical assistance if the robot needs it. In a less accepting environment, the robot can complete its task, but it may be faced with hostile individuals disturbing its operation. The worst-case scenario assumes total rejection, which makes the operation of the robot impossible and leads to a substantially more negative assessment of the operating company. In reality, a mixed appearance of the above-described

reactions is expected depending on the individual. The optimization of the robot needs to focus on making average attitude favourable.

Caspersen and Navrud (2021) examined the weight of need for sustainability in consumers' attitude compared to other factors. Their findings indicate that there is a group of customers preferring greener modes of transport and therefore willing to accept later delivery.

According to the research of Figliozzi et al. (2020), there is a great difference in the attitude of each customer type towards delivery robots, which indicates that consumers cannot be treated as a homogenous group. If we sought to draw conclusions collectively regarding social acceptance, it would lead to an incorrect interpretation of the obtained results leading to faulty decision making. Age appears to be one of the strongest influencing powers, showing an opposite strong relationship with acceptance. Certain factors only affect certain customer types more strongly, such as the positive relationship between the qualities of their place of residence in terms of shopping facilities and acceptance.

Kapser et al. (2021) defined autonomous delivery robots as a tool in the battle against COVID-19; thus, they attached an even greater value to them, and to pioneering delivery practices in a broader sense. Nevertheless, the study – which investigated the difference between the attitudes of men and women towards delivery robots – did not find markedly developed acceptance patterns. It seems that people know too little about the topic to form an opinion. At the same time, it is exactly a crisis, similar to the pandemic, which may lead to developing a wider-scale societal will towards a new practice offering a solution and finding a receptive environment.

Marsden et al. (2018) found that autonomous delivery robots are considered “environmentally friendly” and “innovative”, whereas on the negative side they are considered to be “uncanny”, “dangerous” or “not trustworthy”.

According to the results of Yuen et al. (2022), attitude shows the largest effect on consumers' intention to use autonomous delivery vehicles, followed by perceived usefulness, perceived susceptibility, perceived severity, perceived ease of use, subjective norm, and perceived behavioural control. Joerss et al. (2016) investigate autonomous delivery robots, but their study is rather descriptive in nature and little emphasis is placed on the acceptance of them.

4. Social judgement of autonomous delivery robots in Hungary

As the next stage of our research, we intended to conduct an empirical survey. We considered it important to learn about the attitudes towards delivery robots based on a large sample ($n > 100$), as well as a more profound examination of the connections and ideas behind the attitudes. We applied multiple methodologies to cover these criteria.

Table 1 Methodologies applied in the empirical research and their aim

| Name of methodology | Sample size | Aim of research |
|---|-------------|---|
| Netnography research | 320 | To identify the attitude types of the local society regarding autonomous delivery robots based on online comments and then to categorise commenters based on attitude |
| Online questionnaire | 131 | To study the relationship between demographic and lifestyle characteristics and the level of acceptance, to identify rejecting groups, and to explore other connections related to acceptance |
| Motion picture sentiment research with interviews | 16 | To study the effect of visual situational experience material on attitude and to have a deeper understanding of emotions and ideas behind the attitude |

Source: own construction

4.1. Netnography research

We conducted netnography research to learn about existing attitudes and to explore their distribution and influencing factors. Netnography is most frequently and most simply defined as online ethnography; in practice it is a methodology relying on data collection from the content of online communication channels (Dörnyei and Mitev 2010).

4.1.1. The methodology of netnography research

In order to conduct the netnography research in line with the aim of the investigation, we needed relevant data in time and space, i.e., recent and Hungarian comments. For this we studied the comments under the writings about delivery robots in domestic media and the posts related to the topic in social media over a timeframe of one year, during the period between 20th October 2021 and 20th October 2022. Finally, the 623 comments forming the basis of the research came from the comment sections of Telex.hu (Tech column) and EMFIE – Innovations of your future pages, based on which 320 people were identified according to gender and attitude.

Reading the comments revealed that several ideas recur; many see the same debatable aspects of the concept of delivery robots. The common ground was the tone, the type (or, at all, existence) of arguments, the source of occasional concerns, the comment, and the intention of the commenter. Thus, these assumptions no longer seemed to be reflecting an individual but rather a communal attitude. The overall picture indicated that we basically examine a heterogeneous set, including markedly outlined subsets with strong internal cohesion. We hereinafter refer to these interconnected attitudes as attitude types.

4.1.2. The results of the netnography research

After studying the comments, we categorised the commenters into five attitude groups. These groups were formed based on the content of the comments, while certain groups were associated with a specific style of expression. The five attitude groups are the following¹³:

1. Problem-raising rejectionists (46.4%): almost half of the commenters, 46.4% of them, can be categorised in this group. They are characterised by objecting to the introduction of delivery robots due to one or more perceived or real negative phenomena or impacts until the problem is unresolved: *"Similar robots have been tested at our place. A part of them were stolen, a part of them were damaged, and the rest couldn't 'take the heat'. This technology is still in its infancy"*.
2. Total rejectionists (28.8%): they totally, without compromises, object to the introduction of delivery robots; the reason for rejection often remains unrevealed, they frequently express their attitude towards the technology without any underlying arguments. In this group it is not uncommon to have emotional outbursts and offensive wording: *"There's no need for such bull[...]!!!! Those who made it up are [...]!!!!!"*.
3. Realists (10.0%): these commenters consider both the potential advantages and disadvantages of delivery robots. Their comments are often informative, they can be responses to other comments to confirm, refine, or confute the position they adopt, as well as to highlight the opposite side. They are open to new information and occasionally raise questions: *"Here the pavements are quite wide for them to have enough space. It's funny how they stop where the pavement ends and wait if a car or something comes and if not, they quickly rush across to the other side. Allegedly the energy they use during a delivery is the same energy needed for boiling a cup of water. I think after a while it can totally replace couriers, but they can't travel in every city, just where the pavements are wide"*.

¹³ We corrected the spelling mistakes in the quotations where necessary and we indicated the commenters' wordings which were formulated in an unprintable style with dots in square brackets.

4. Optimists (8.2%): they support the introduction of delivery robots, they focus on the positive outcomes of the technology or on the problems related to the current delivery system which justify the use of the new technology; they often oppose the arguments of rejectionists, frequently replying to the comments in an informative way with data or personal conclusions relying on data: *“I’ve seen quite a few here in England, it’s not accident-prone, it’s fully equipped with sensors and lights, and they’re slow anyway, they travel at a maximum of 5 km/hour, it’s a great help for the elderly”*.
5. Conspiracy theory believers (6.6%): they emerge from the total rejectionists; they do not hide that their rejecting attitude is not only about the technology in question but they consider it as a part of a broader system (often world order) unsupported by facts which they envisioned and they reject this system: *“if robots become widespread, they want to introduce basic income in parallel, which will entail the confiscation of private property, it’s been planned”*.

The results of the attitude test carry various information and the conclusions drawn cover several areas. Unstructured data collection enabled taking account of the individual aspects of the commenters. The most frequently emerging critical point is public safety, the physical safety of the delivery robots, furthermore, many have doubts about transport infrastructure, especially the condition of public roads, for example: *“on these pavements, roads? There is no straight or smooth surface within 2 metres”*.

It is implied that if delivery robots arrived in a rejecting environment, it would have adverse effects not only in terms of business. The reactions of the total rejectionist group go far beyond the mere unwillingness to use the robots. There were several commenters who basically used a threatening tone when writing about what would happen if they encountered delivery robots; besides an intention to cause damage to them, some commenters also threatened the developers and policymakers linked to the scheme, for instance: *“Just set up the system...we’ll hunt for them....then you.”*

It is important to see that besides the obstruction for obtaining material gain, which is frequently mentioned by problem-raising rejectionists, jeopardizing because of mere hostility without any financial motivations can also pose a serious threat to the delivery robot system. It is also shown that attitude, or at least its development, is not detachable from time. The comments of conspiracy theory believers often associated the introduction of delivery robots with the vaccination against the coronavirus, which obviously could not have been possible three years ago: *“then they can sit confined within four walls waiting for the robot or drone. Meanwhile they can be just tapping their mobile phone, after getting the umpteenth shot. Nice future! Right?”*. Therefore, it is also possible that attitude research conducted in two or three years from now would find a connection between the acceptance of delivery robots and phenomena which we know nothing about at the moment.

Rejecting or partly rejecting groups often related their doubts to factors which do not necessarily refer to real difficulties (e.g., delivering to higher floors is considered an unsolvable task for a robot by many, even though certain types are suitable to climb stairs).

4.2. Questionnaire survey

Our questionnaire survey relied on literature findings, international methodologies, and our netnography results. We studied the relationship between nominal and ordinal measurement level variables in the questionnaire survey, which we carried out via crosstab analysis.

4.2.1. The methodology of the questionnaire survey

The questionnaire, entitled *Social acceptance of autonomous delivery robots in Hungary*, was compiled based on the series of questions used for Kapser’s attitude test in Germany in 2019, taking account of the results of the netnography research. The original questions were specifically

restricted to autonomous delivery robots travelling on the pavement, while the present research also focuses on road and drone delivery robots, thus we surveyed the attitudes towards each delivery robot type respectively in the case of the questions related to such situations (typically to traffic situations).

The questionnaire was available online between 27th September and 1st November 2022 in social media. It is to be noted that the questionnaire was available in the form of an advertisement targeted at the entire Hungarian population. The results of the survey are based on the responses given by 131 persons. The demographic composition of the respondents is the following: 61.1% female, 39.9% male. The median of the age of respondents is 25–34 years, its modus is 18–24 years. The largest portion of the subjects, 49.04%, have a university degree or higher qualifications, while 4.58% reported their highest level of education as lower than a secondary school leaving certificate.

4.2.2. The result of the questionnaire survey

Although self-driving technology is becoming less of a novelty for the general public, the segment of delivery robots is a much lesser-known area, whether in terms of the number of scientific publications or the number of economic and public press articles; nevertheless, the majority of respondents (68.70%) had heard about the scheme and 3.1% had already used a delivery robot.

In the framework of testing the relationship of the responses, first we look at the relationship between demographic characteristics and acceptance. Several attitude tests conducted in the topic of autonomous technology have identified excessively rejecting groups (e.g., the elderly, women), however, the observations of the present research did not indicate that the respondents' gender, age, or highest level of education had a significant relationship with their level of information on autonomous delivery robots (gender: $\chi^2=3.676$ and $\text{sig}=0.055$; age: $\chi^2=2.921$ and $\text{sig}=0.232$; level of education: $\chi^2=2.848$ and $\text{sig}=0.091$), their support for the introduction of the technology (gender: $\chi^2=2.173$ and $\text{sig}=0.337$; age: $\chi^2=4.145$ and $\text{sig}=0.387$; level of education: $\chi^2=0.178$ and $\text{sig}=0.915$), and their trust in delivery robots (gender: $\chi^2=1.657$ and $\text{sig}=0.437$; age: $\chi^2=1.420$ and $\text{sig}=0.841$; level of education: $\chi^2=0.159$ and $\text{sig}=0.924$).

Among previous research studies, besides the rejecting groups identified based on demography, we found papers which focused on the lifestyle of the subjects, connecting its characteristics with acceptance (Figliozzi et al., 2020; NMHH, 2019). Relying on this, we looked at whether rejecting groups can be identified based on the responses given to questions surveying lifestyle habits and the responses related to attitude in the first section of the questionnaire.

Of the respondents who use five or fewer mobile applications on a daily basis (including the respondents who do not use any apps) 38.2%, would support the introduction of autonomous delivery robots, while almost the same proportion (36.8%) expressly opposes it. By contrast, more than two-thirds, 69.2% of the respondents using at least six mobile applications on a daily basis would support the availability of robot-based delivery, and only 7.7% oppose the emergence of the technology. This difference can be considered significant with values of $\chi^2=16.411$ and $\text{sig}=0.000$; the daily users of a higher number of mobile applications showed a substantially higher level of support towards delivery robots compared to those who run a lower number of apps on a daily basis. Given the value of $C=0.358$, the strength of the relationship can be regarded as medium.

There is also a significant relationship between the general openness to technology and the financial sacrifice for a good delivery option. 41.7% of the respondents who claim to be seeking technological novelties believe that a really favourable delivery system would be worth a higher price, while 78.8% of the opponents of tech reforms claim that this alternative would not be valuable for them ($\chi^2=24.454$ and $\text{sig}=0.000$).

In the next step, we compared the attitudes towards delivery robots, i.e., we explored whether there is a significant difference in the relation to a delivery robot depending on whether it is a pavement, road, or drone delivery robot. As the difference between the robot types is primarily

manifested in what form they participate in traffic, the risk assumed about the appearance of each type in traffic is the focus of investigation. For this, we studied the delivery robot types via crosstab analysis and the proportion of the respondents claiming that the appearance of each type in traffic would be risky. The results show that there is a significant relationship ($\chi^2=16.124$; sig=0.003) between the type of the delivery robot and the risk felt about its participation in traffic, and its strength is weak ($C=0.145$). Road delivery robots are considered to be a potential risk in traffic by the respondents in the highest percentage (66.4%) and they feel the lowest risk regarding drone delivery robots in this respect (44.1%), while pavement robots were considered risky by 55.8%. Overall, the survey showed that based on demographic characteristics we cannot clearly delineate a group which expresses remarkable rejection or acceptance towards autonomous delivery robots, while in the case of examining daily habits we can define differing acceptance for groups having a certain routine (see the relationship between the number of daily used mobile applications and the level of acceptance). The most important connection which the survey highlighted is the relationship between the type of the delivery robot and the social attitude expressed towards it. We can therefore conclude that delivery robots cannot be treated as a homogenous set when we look at them in connection with acceptance. Thus, we must make a distinction regarding the level of social preparedness depending on whether we study flying or rolling delivery robots and we must take this difference into account when faced with a live testing situation of a specific robot type.

4.3. Motion picture sentiment research with interviews

The motion picture sentiment research may be one of the data collection processes which is the most easily transformable to real aspects, since we showed situations to the participants which were recorded in real life, technically it may as well have happened with them, and such cases can happen in general (Siedlecka and Denson 2019). In the framework of the motion picture sentiment research, a video was designed in which every frame was searched and pieced together based on the international literature. This video was watched by the subjects while they were asked about their experiences, feelings, thoughts, and expectations.

4.3.1. The methodology of the motion picture sentiment research

The video contained several short scenes where delivery robots can be seen in various traffic and functional situations and had to cope with different difficulties. The research aimed to assess how each situation affects the individual's sense of safety when (1) they are travelling as a pedestrian and delivery robots are travelling around them, when (2) they are travelling as a car driver and delivery robots are travelling around them, and when (3) they are waiting for their parcel which is delivered by a delivery robot. As the video progressed, the robots could be seen in increasingly complex situations, they had to cope with their own limitations and challenges posed by the other participants in traffic on an increasingly high level. The presented situations were the following (Figure 1):

1. the delivery robot travels on the street, without other traffic participants and disturbances;
2. a customer opens the load compartment of the robot with a code received in a mobile application and collects their parcel;
3. the delivery robot travels in a busier environment compared to earlier, passers-by come from both directions, the robot reacts to everything properly (e.g., brakes when a cyclist comes from the opposite direction);
4. the delivery robot should go across a pavement section narrowing because of tree roots and gets stuck on the roots;
5. a car hits the delivery robot coming on the pavement;
6. the delivery robot cannot take a turn because of the narrow pavement and a simultaneously close wall and curb, it gets confused and climbs the wall in the end.

Figure 1 Situations shown during the motion picture sentiment research



1. Delivery robot travelling without disturbances



2. Successful delivery



3. Delivery robot in heavier traffic



4. Delivery robot getting stuck



5. Delivery robot having an accident
Source: own construction



6. Delivery robot getting confused

At the end of each scene, the subjects were asked to evaluate their sense of safety in the above-mentioned three roles on a scale of 1 to 10, where 10 refers to the highest degree of safety and 1 indicates the highest level of danger. 16 persons participated in the series of interviews, 10 women and 6 men.

4.3.2. The result of the motion picture sentiment research

Based on the average of the values given throughout the research, the subjects felt most comfortable as a pedestrian (7.79), and the most vulnerable as a car driver (6.01). In contrast, based on the average of the final evaluations at the end of the video material, the respondents' sense of safety is the lowest in the situation of waiting for the parcel (5.00). The average of the final evaluations is lower in the case of all three roles (pedestrian: 7.25; car driver: 5.06; waiting for parcel: 5.00) than the average of the evaluations provided during the entire test (pedestrian:

7.79; car driver: 6.01; waiting for parcel: 6.36). Consequently, the initial, virtually seamless situations build trust, then the increasing degree of difficulties trigger a more critical evaluation in the audience. It is also confirmed by the observation that when expressing with their own words, the interviewees mostly expected a positive outcome from the situations where they were asked about their expectations, thus the fact that the technology was not able to resolve a given difficulty appeared to be disappointing and lead to a decline in the respondents' sense of safety.

When analysing the difference between the average points of the successive scenes in terms of sense of safety, it can be identified which situations influenced and shaped the subjects' feelings to the greatest extent. Unsurprisingly, as a car driver, the collision of the delivery robot and the car resulted in the highest decrease in points, the robots received an evaluation 1.5 points lower on average from a car driver's perspective than one scene earlier. As a person waiting for the parcel, the respondents were unsettled the most by the delivery robot getting stuck on the roots of the tree, meaning a decline of 1.25 points on average in their sense of safety. The participants felt most comfortable in the role of pedestrian, here the greatest effect was exerted by the confused robot featured in the last scene, where the sense of danger increased by 4.4% in the respondents. Although the traffic incidents reduced the research participants' sense of safety, many of them emphasised that it was the environment and the human element rather than the delivery robots which triggered some concerns about the functionality of the scheme; according to common feedback, it was not the robot and its characteristics that they held responsible for a given inconvenience.

5. Discussion

We aim to link our results to relevant findings of international studies in the related field, presented in Section 3. However, it is important to highlight that a broader comparison is not possible due to the differences in the samples, the method of inquiry, or the differences in the analytical methodologies used. Responsibly and reasonably we only have the opportunity to name the main findings of the studies. Since the questions and variables behind them can differ significantly, the findings are suitable for establishing general context only and not for drawing deep and detailed conclusions.

The phenomena experienced during the preparation of the present paper show that even though little reference is made to autonomous delivery robots in public discourse, the Hungarian population is far from neutral about the topic. At the same time, due to the scarcity of available content, civil discussions may escalate into making assumptions and connections unsupported by facts. The same observations can be found in international studies where participants have not yet encountered autonomous delivery robots in real life, such as in the research conducted by De Groot (2019) or Kasper and Abdelrahman (2020).

In our study, we did not find a statistically significant correlation between the acceptance of autonomous delivery robots and demographic characteristics, which is consistent with the findings of Kasper and Abdelrahman (2020) but contradicts the results of Figliozzi et al. (2020) and Joerss et al. (2016). However, our results regarding the lifestyle of the participants align with the findings of Figliozzi et al. (2020). In line with the results of Kasper and Abdelrahman (2020), we identified a significant relationship between general openness to technology and willingness to make financial sacrifices. Yuen et al. (2022) emphasised the role of perceived usefulness in the acceptance of autonomous delivery robots, which corresponds to our finding that respondents also considered usefulness as a significant factor.

It could be observed that information continuously shaped and refined the attitude towards delivery robots and this could be presented as a positive and negative effect as well. It would be important to establish a credible forum which enabled sharing informative contents by insiders and their consumption by lay people. Technology and transport journals, and the commercial media in general, could play a great role in this area since they have already provided advertising

space for logistics service providers, there is currently no reason why they could not provide information for consumers about deliveries by a delivery robot in the same way. The research subjects' individual unstructured feedback also indicated that when encountering the idea of delivery robots it is less than obvious for a layman what benefits such a development entails and whether it is more than just the current capabilities of technology. It is worth communicating the motivations behind the development of delivery robots as well as the issues of last-mile delivery and urban motor vehicle traffic by utilising marketing opportunities, in the same way that emphasising environmental awareness is already applied by numerous companies in their commercials.

The questions raised by the research subjects cannot necessarily be traced back to the lack of awareness. People who are interested in and really intend to learn about the topic cannot find a considerable amount of information on the planned framework of the Hungarian introduction of delivery robots. Transparent planning would be essential on the part of the transport policymakers, developers and other stakeholders to reduce mistrust, which is established based on insufficient and incorrect information contributed to by the lack of official communication.

The research identified connections regarding social attitude (e.g., differing acceptance of different delivery robot types), although it could not find a relationship between the given variables in several points of the research. It is advised to study the Hungarian public on further (larger) samples to confirm or revise the phenomena recorded in the present paper and their significance. In addition, the present paper only examines the Hungarian environment welcoming the delivery robots in terms of social attitude, while the other environmental aspects influencing the functionality of the concept, such as legislative, economic and infrastructural context are still unexplored. Their investigation is essential to elaborate a well-founded and operational strategy to introduce delivery robots.

6. Conclusions

We approached delivery robots from two directions, through the issues of last-mile delivery and autonomous technology, learning about the crisis of the above segment of logistics which has developed approximately in the last ten years and the solutions autonomous freight vehicles may provide to the existing problems. We find autonomous delivery robots in the cross-section of logistics, service quality, and transport needs. We aimed to prepare a research study which involves data collection with several methodologies and combines the advantages of each procedure by conducting them in their own structures but linking them logically.

In the first stage of the empirical study, we conducted netnography research, where we analysed the online comments in the topic of autonomous delivery robots from the past year. With the help of this method, we identified the common attitude types (optimist, realist, problem-raising rejectionist, total rejectionist, conspiracy-theory believer) and we examined the incidence rate of each type by assigning the commenters to these groups.

Using an online questionnaire, we identified the relationship of demographic and lifestyle characteristics and the attitude towards delivery robots. The result of the survey did not identify rejecting demographic groups, on the other hand, there is a relationship between lifestyle habits or the type of the robot and acceptance.

In the final stage, we carried out motion picture sentiment research, where the research subjects watched a short video featuring delivery robots in various situations and were asked interview questions regarding the experience material in order to facilitate highlighting their deeper feelings and ideas underlying acceptance or rejection. One of the problems that concerns the respondents is the negative influence of the human factor on the operation of delivery robots.

References

- Abdelrahman, M. – Bernecker, T. – Kapser, S. (2021): Autonomous delivery vehicles to fight the spread of Covid-19 – How do men and women differ in their acceptance? *Transportation Research Part A*, Volume 148 (2021), pp. 183-198
- Ambrus I. (2019): Az autonóm járművek és a büntetőjogi felelősségre vonás akadályai. In Mezei Kitti (szerk.): *A bűnügyi tudományok és az informatika* (Budapest–Pécs: PTE ÁJK–MTA TK 2019) 9–26.,
- Baccarella, C.V., Wagner, T.F., Scheiner, C.W., Maier, L. and Voigt, K.-I. (2020), "Investigating consumer acceptance of autonomous technologies: the case of self-driving automobiles", *European Journal of Innovation Management*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/EJIM-09-2019-0245>
- Banyár J. (2019): Az önvezető autók lehetséges hatásai az életmódra és a gazdaságra. *Polgári Szemle*, 4–6, 132–152., DOI: 10.24307/psz.2019.1210
- Boysen, N. – Fedtke, S. – Schwerdfeger, S. (2020): Last-mile delivery concepts: a survey from an operational perspective. *OR Spectrum*, 43, pp. 1-58
- Caspersen, E. – Navrud, S. (2021): The sharing economy and consumer preferences for environmentally sustainable last mile deliveries. *Transportation Research Part D*, Volume 95 (2021)
- Csizmadia Z. (2021): Az autonóm és önvezető járművekkel kapcsolatos ismeretek, tapasztalatok és általános vélekedések. In Csizmadia Z. – Rechnitzer J. (szerk.): *Az önvezető járművek világa*. Akadémiai Kiadó, Budapest. DOI: 10.1556/9789634546290
- De Groot, S. (2019): Pedestrian Acceptance of Delivery Robots: Appearance, interaction and intelligence design. <http://resolver.tudelft.nl/uuid:f9e8c003-c8fc-4075-bff3-0d54e0f0fecb> Downloaded: 27 July 2022
- Siedlecka, E. – Denson, T. F. (2019): Experimental Methods for Inducing Basic Emotions: A Qualitative Review. *Emotion Review* 11 (1) pp. 87–97
- Dimitrapoulos, G. – Panagiotopoulos, I. (2018): An empirical investigation on consumers' intentions towards autonomous driving. *Transportation Research Part C*, Volume 95 (2018), pp. 773-784
- DMV (2023): Disengagement Reports 2022. State of California Department of Motor Vehicles, Sacramento, USA.
- Dörnyei, K. - Mitev, A. Z. (2010): Netnográfia avagy online karosszék-etnográfia a marketingkutatásban. *Vezetéstudomány* 41(4). pp. 55-68
- Figliozi, M. A. (2017): Lifecycle modeling and assessment of unmanned aerial vehicles (Drones) CO2e emissions. *Transportation Research Part D*, Volume 57 (2017), pp. 251-261
- Figliozi, M. A. (2020): Carbon emissions reductions in last mile and grocery deliveries utilizing air and ground autonomous vehicles. *Transportation Research Part D*, 85 (2020)
- Figliozi, M. A. – Jennings, D. (2020): Autonomous delivery robots and their potential impacts on urban freight energy consumption and emissions. *Transportation Research Procedia*, 46 (2020), pp. 21–28
- Figliozi, M. A. – Golias, M. – Mishra, S. – Pani A. (2020): Evaluating public acceptance of autonomous delivery robots during COVID-19 pandemic. *Transportation Research Part D*, 89 (2020)
- Gábor, B. (2022): Az intelligens közlekedési rendszerek szerepe az okos városok fejlesztésében. *Észak-Magyarországi Stratégiai Füzetek*, 3, 100-116.
- Garus, A. – Alonso, B. – Alonso Raposo, M. – Grosso, M. – Krause, J. – Mourtzouchou, A. – Ciuffo, B. (2022): Last-mile delivery by automated droids. Sustainability assessment on a real-world case study. *Sustainable Cities and Society*, Volume 79 (2022)
- Gyimesi Á. (2019): Az autonóm gépjárművek hatása a kormányzati költségvetésre és a foglalkoztatásra. *Tér Gazdaság Ember*, 1, pp. 137-158

- Hajdú J. (2020): A mesterséges intelligencia hatása a munakerőpiacra, avagy elveszik-e a robotok az ember munkáját. Infokommunikáció és Jog, 2020/2
- Havlíčková, Darina - Gabrhel, Vít. – Adamovská, Eva – Zámečník, Petr (2019): The role of gender and age in autonomous mobility: general attitude, awareness and media preference in the context of Czech Republic, Transactions on Transport Sciences. Peer-Reviewed Open Access Journal. ToTS. 10(2), pp. 53–63
- Heimfarth, A. – Hübner, A. – Ostermeier, M. (2022): A mixed truck and robot delivery approach for the daily supply of customers. European Journal of Operational Research, Volume 303 (2022), pp. 401-421
- Högye-Nagy, A. – Kovács, G. – Kurucz, Gy. (2023): Acceptance of self-driving cars among the university community: Effects of gender, previous experience, technology adoption propensity, and attitudes toward autonomous vehicles, Transportation Research Part F: Traffic Psychology and Behaviour, Volume 94, Pages 353-361, ISSN 1369-8478, <http://doi.org/10.1016/j.trf.2023.03.005>
- Hudik, M. – Osakwe, C. N. – Ramayah, T. – Říha, D. – Stros, M. (2022): Critical factors characterizing consumers' intentions to use drones for last-mile delivery: Does delivery risk matter?
- Hutchins, N., Hook, L., 2017. Technology acceptance model for safety critical autonomous transportation systems. 2017 IEEE/AIAA 36th Digital Avionics Systems Conference (DASC). 2017 IEEE/AIAA 36th Digital Avionics Systems Conference (DASC), pp 1–5. <https://doi.org/10.1109/DASC.2017.8102010>
- Janebäck, E. – Kristiansson, M. (2019): Friendly robot delivery - Designing an autonomous delivery droid for collaborative consumption. <https://odr.chalmers.se/server/api/core/bitstreams/f5720f24-ef83-4fd7-9238-bfc9585156df/content>. Downloaded: 25 July 2022
- Joerss, M., Schroder, A., Neuhaus, F., Klink, C. and Mann, F. (2016), "Parcel delivery. The future of last mile", available at: https://bdkep.de/files/bdkep-dateien/pdf/2016_the_future_of_last_mile.pdf/
- Kapser, S. (2019): User Acceptance of Autonomous Delivery Vehicles – An Empirical Study in Germany. University of Northumbria at Newcastle (United Kingdom) ProQuest Dissertations Publishing, 2019.
- Kapser, S. – Abdelrahman, M. (2020): Acceptance of autonomous delivery vehicles for last-mile delivery in Germany – Extending UTAUT2 with risk perceptions. Transportation Research Part C, Volume 111 (2020), pp. 210-225
- Kecskés, Gábor (2020) Az autonóm járművek jogi kérdéseinek nemzetközi kontextusa, különös tekintettel a környezeti jogi vetületekre. ÁLLAM- ÉS JOGTUDOMÁNY, 61 (4). pp. 52-64. ISSN 0002-564X
- Kovács P. – Lukovics M. (2022): Factors influencing public acceptance of self-driving vehicles in a post-socialist environment: Statistical modelling in Hungary. Regional Statistics, Vol. 12. No. 2. 2022
- Koul, S., & Eydgahi, A. (2018). Utilizing Technology Acceptance Model (TAM) for driverless car technology. Journal of Technology Management & Innovation, 13(4), 37–46. <https://doi.org/10.4067/S0718-27242018000400037>
- KPMG (2021): Autonomous Vehicles Readiness. KPMG International, Amstelveen.
- Lados M. – Tóth M. L. (2019) Autonóm járművek az okos városokban. Tér Gazdaság Ember, 1, pp. 159-174
- Lemardelé, C. – Estrada, M. (2021): Does size really matter? Dual distribution channel with vans and autonomous delivery devices. Transportation Research Procedia, Volume 58 (2021), pp. 262-269
- Liljamo, Timo - Liimatainen, Heikki - Pöllänen, Markus (2018): Attitudes and concerns on automated vehicles. Transportation Research Part F: Traffic Psychology and Behaviour, 59, pp. 24–44

- Lipták, K. (2022): A „home office” hatása a vásárlási és a fogyasztási szokások alakulására. In: Sikos, T. T – Molnár, D. (szerk.) Covid–19-világjárvány hatása a kiskereskedelemre. Ludovika Egyetemi Kiadó, Budapest. pp. 111-134.
- Lipták, K. – Musinszki, Z. (2022): Impact of teleworking on shopping habits during the COVID-19 pandemic in Hungary. JOURNAL OF INTERNATIONAL STUDIES 15 : 3 pp. 186-200.
- Lukovics M., Udvari B., Zuti B., Kézy B., (2018): Az önvezető autók és a felelősségteljes innováció. Közgazdasági Szemle, 65(9), 949-974. o. <http://doi.org/10.18414/kszh.2018.9.949>
- Lukovics M. – Zuti B. – Fisher E. – Kézy B. (2020): Autonomous cars and responsible innovation. In Andreász Kosztópulosz – Éva Kuruczleki (eds.) (2020): The Challenges of Analyzing Social and Economic Processes in the 21st Century. University of Szeged Faculty of Economics and Business Administration, Szeged
- Lyon-Hill, S. – Tilashalski, M. – Ellis, K. – Travis, E. (2020): Measuring the Effects of Drone Delivery in the United States. https://vtechworks.lib.vt.edu/bitstream/handle/10919/100104/Effects%20of%20Drone%20Delivery%20US_September%202020.pdf
Downloaded: 20 September 2022
- Madarász N. – Szikora P. (2018): Önvezető autók társadalmi elfogadottsága napjainkban. In. Csiszárík-Kocsir Á. – Garaí-Fodor M. (szerk.): Vállalkozásfejlesztés a XXI. században. Óbudai Egyetem, Keleti Károly Gazdasági Kar, pp. 159-171
- Majó-Petri Z. – Huszár S. (2020) Autonóm járművek, önvezető autók: mit gondol a közönség? KÖZLEKEDESTUDOMÁNYI SZEMLE, 70 (1). pp. 66-75. ISSN 0023-4362. <http://doi.org/10.24228/KTSZ.2020.1.2>
- Matthews, M. – Chowdhary, G. V. – Kieson, E. (2017): Intent Communication between Autonomous Vehicles and Pedestrians. <https://arxiv.org/pdf/1708.07123.pdf>
Downloaded: 27 July 2022
- Miskolczi, Márk ; Ásványi, Katalin ; Jászberényi, Melinda ; Kökény, László (2021): Hogyan döntsön a mesterséges intelligencia? Az önvezető autók morális kérdései. Magyar Tudomány 1823, 342–352 <http://doi.org/10.1556/2065.182.2021.3.6>
- Moták, L., Neuville, E., Chambres, P., Marmoiton, F., Monéger, F., Coutarel, F., Izaute, M. (2017) Antecedent variables of intentions to use an autonomous shuttle: moving beyond TAM and TPB? European Review of Applied Psychology, 67, 5, pp. 269–278.
- Müller, Julian M. 2019. "Comparing Technology Acceptance for Autonomous Vehicles, Battery Electric Vehicles, and Car Sharing—A Study across Europe, China, and North America" Sustainability 11, no. 16: 4333.
- Nagy, B., Prónay, S. és Lukovics, M. . (2022) „Én vezessek, te vezetsz vagy önvezet? – az önvezetőjármű-elfogadás öt perszóna típusa Magyarországon”, Marketing & Menedzsment, 56(2), pp. 23–34. doi: 10.15170/MM.2022.56.02.03.
- NMHH (2019): NMHH-piackutatás: Az okosautóval az a baj, hogy okos, http://nmhh.hu/cikk/200730/NMHHpiackutatas_Az_okosautoval_az_a_baj_hogy_okos (Downloaded: 4 October 2022)
- Palatinus, Z., Volosin, M., Csábi, E., Hallgató, E., Hajnal, E., Lukovics, M., Prónay, Sz., Ujházi, T., Osztoányi, L., Králik, T., Szabó, B., Majó-Petri, Z. (2022): Physiological measurements in social acceptance of self-driving technologies. Scientific Reports 12, 13312. <https://doi.org/10.1038/s41598-022-17049-7>
- Páthy Á. (2021): Kényelem és félelem – az önvezető járművek várható előnyeinek és hátrányainak megítélése. In Csiszmadia Z. – Rechnitzer J. (szerk.): Az önvezető járművek világa. Akadémiai Kiadó, Budapest. <http://doi.org/10.1556/9789634546290>
- Peppel, M. – Ringbeck, J. – Spinler, S. (2022): How will last-mile delivery be shaped in 2040? A Delphi-based scenario study. Technological Forecasting and Social Change, Volume 177 (2022)

- Pettigrew, S. – Fritsch, L. – Norman, R. (2018): The Potential Implications of Autonomous Vehicles in and around the Workplace. *International Journal of Environmental Research and Public Health*, 15 (9)
- Prónay, S., Lukovics, M., Kovács, P., Majó-Petri, Z., Ujházi, T., Palatinus, Z., & Volosin, M. (2022). Pánik próbája a mérés: Avagy önvezető technológiák elfogadásának valós idejű vizsgálata neurotudományi mérésekkel. *Vezetéstudomány / Budapest Management Review*, 53(7), 48–62. <https://doi.org/10.14267/VEZTUD.2022.07.05>
- Smahó, M. (2021): Autonóm járművek a jövő városában. In: Csizmadia, Z. – Rechnitzer, J. (szerk.) *Az önvezető járművek világa: Társadalmi hatások és kihívások*. Akadémiai Kiadó, Budapest.
- Szendi, D. – Sárosi-Blága, Á. (2022): Impact of the COVID-19 pandemic on smart city performance in Europe. *ÉSZAK-MAGYARORSZÁGI STRATÉGIAI FÜZETEK* 19: 4 pp. 48-60.
- Venkatesh, V. – Thong, J.Y.L. – Xu, X. (2012): Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *JSTOR*
- Williamson, J. (2022): Business model design for campus-based autonomous deliveries – A Swedish case study. *Research in Transportation Business & Management*, 43 (2022)
- Yuen, K.F. – Koh, L.Y. – Bin Anwar, M.H.D. – Wang, X. (2022): Acceptance of autonomous delivery robots in urban cities, *Cities*, Volume 131, 104056, <https://doi.org/10.1016/j.cities.2022.104056>.
- Zhu, S. – Wang, H. – Zhang, X. – He, X. – Tan, Z. (2022): A decision model on human-robot collaborative routing for automatic logistics. *Advanced Engineering Informatics*, 53, <https://doi.org/10.1016/j.aei.2022.101681>

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The impact of environmental changes on the revenues and costs of Hungarian CEP companies

The emergence and steady growth of e-commerce and its impact are of particular importance for many sectors of the Hungarian economy. One such sector is CEP, i.e., Courier, Express, Parcel. CEP is one of the sectors which, in addition to e-commerce, have been positively affected by the measures taken under COVID-19. In our research, we are looking at the impact of environmental changes in recent years on the revenues and costs of three leading Hungarian companies with an international background. The aim of the research is to describe the changes in the financial situation of these Hungarian companies. We have used publicly available financial data. The CEP market is characterised by the outsourcing of services. This is confirmed by their cost structure. Due to this high level of outsourcing, changes in the global market (such as the increase in fuel prices or the EU's 2019 motor vehicle regulation) have not directly affected companies' costs. It was also found that companies were able to be very flexible in their pricing relative to their costs.

Keywords: Courier, Express, Parcel, DHL, UPS, GLS, Profitability
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Introduction

The coronavirus epidemic in spring of 2020 had a significant impact on the situation of mail order companies, with consumers increasingly opting for online solutions and increased e-commerce increasing their turnover and thus their revenues (Lipták - Musinszki, 2022).

The conceptual definition of courier, express and parcel services (Courier, Express, Parcel, CEP) is not a simple task, its sub-domains are not always clearly distinguishable. The most commonly used concept is that courier, express and parcel services are logistics channels that are capable of delivering relatively small and lightweight shipments in a timely and reliable manner and are characterised by the service provider's commitment to the sender to deliver the shipment within a specified timeframe or at a specified time (Okholm et al., 2013; Kawa and Różycki, 2018, World Economic Forum, 2018).

The courier service is characterised by the fact that no transshipment or processing takes place, the same person delivers the consignment to the consignee as received from the sender. The delivery is made either personally or by car or van. Same day delivery is agreed. The size, weight and nature of parcels are limited differently by the service providers.

In the case of express services, the mail is collected from the sender, processed and then forwarded from a central transshipment point to the addressee. Delivery times are fixed, and typically smaller unit loads (i.e. not freight) can be moved. Road and/or air transport is the most common. The service provider provides accurate information on the route, location and delivery of the shipment (Szegedi - Perzenszki, 2017, Okholm et al., 2013; Kawa and Różycki, 2018,)

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¹⁵ associate professor, University of Miskolc

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Parcel delivery services cannot be sharply separated from express services (often, they are operated by the same organisations). They are characterised by normal delivery times, with stricter restrictions on the size and weight of the items (Szegedi - Perzenszki, 2017).

CEP in the international and Hungarian economy

The number of parcels delivered globally has increased 2.6 times in the last six years (Figure 1), and market analysts expect a further doubling by 2026, with 131 billion parcels delivered every second in 2020, or 4,160 parcels.

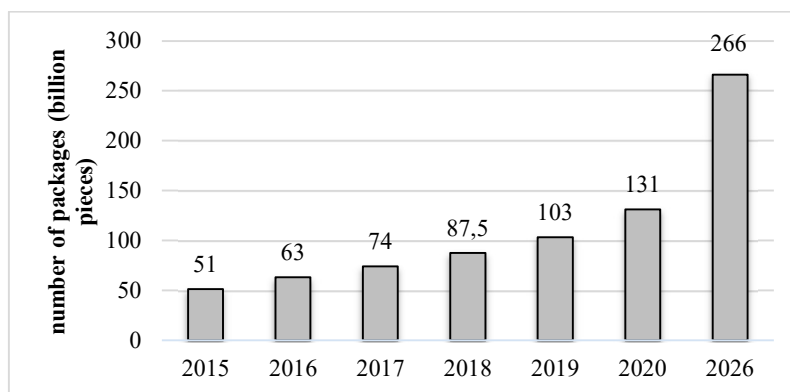


Figure 1: Number of packages delivered worldwide (2015-2026)

Source: based on research by Pitney Bowes (2021) and Statista

In terms of the number of deliveries, China is the leader with 83.4 billion shipments per year, followed by the United States with 20.2 billion and Japan with 9.1 billion. The three countries thus account for 87% of the world parcel delivery market. In Europe, Germany is the "top" with 4.1 billion shipments, followed by France (1.6 billion), Italy (1.3 billion), Norway (98.5 million), Sweden (170 million) and the United Kingdom (Pitney Bowes, 2021).

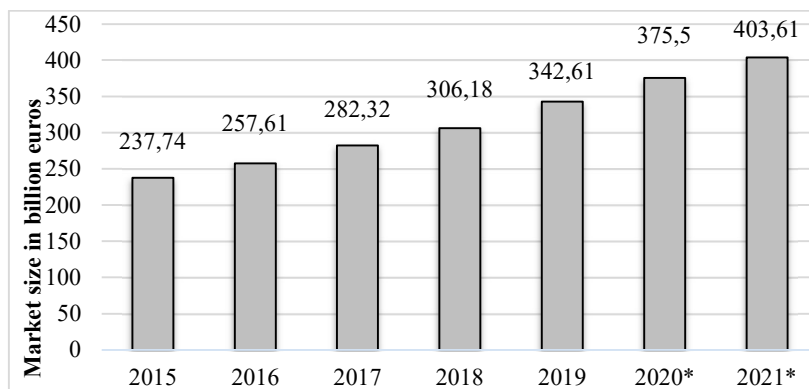


Figure 2: Global CEP market value (2015-2021)

Source: own editing based on Statista research¹⁷







This increase in parcel volumes has led to a 44% growth in the market from 2015 to 2019, rising to \$394 billion by 2021 (Courier, Express and Parcel (CEP) Market, 2022). Some estimates

¹⁷ <https://www.statista.com/statistics/723986/cep-market-total-revenue-worldwide/>

suggest that this market is expected to reach \$676 billion by 2027, while others suggest that it will be "only" \$591 billion by 2028. Whichever way you look at it, analysts are certainly optimistic about the growth of the CEP markets and the picture is certainly one of a dynamic industry (Mazur et al., 2019, Esser - Kurte, 2021)

Globally, the largest players in the market are led by UPS with a capital value of €162.7 billion, followed by Germany-based DHL with nearly half that value, then FedEx and China's SF Express (Table 1). The first five columns of the table show the top five players by capital value. GLS, in the sixth column, is one of the subjects of our analysis. It is not in the top 10 in terms of capital value, but it is very popular in parcel delivery in Europe and therefore in our country.

Table 1: Emerging global players in parcel services (2020-2021)

| Title | UPS  | DHL  | FedEx  | SF Express  | Japan Post  | GLS  |
|---|--|--|--|---|--|--|
| Market capitalisation (billion dollars) | 162,7 | 83,1 | 60,8 | 47,9 | 33,9 | n.a. |
| Revenue (2020-2021) | 97,3 billion USD | 66,8 billion EUR | 84 billion USD | 24 billion USD | 109,9 billion USD | 4,5 billion EUR |
| Number of employees (headcount) | 534 000 | 400 000 | 600 000 | 121 925 | 194 842 | 21 000 |
| Coverage (number of countries) | 220 | 220 | 220 | 78 | 50 | 41 |
| Date of incorporation | 1907 | 1969 | 1971 | 1993 | 1885 /2007 | 1989 |
| Headquarters | USA | Germany | USA | China | Japan | Netherlands |

Source: Research by Statista¹⁸ and based on company websites, business reports, own editing

In most European countries, however, global players compete with one or two large domestic players in terms of service offerings and costs. For example Post NL (Netherlands), Le Groupe La Poste (France), Royal Mail (UK), Grupo Correos (Correos Express) in Spain and Hermes Logistik Gruppe (B2C segment) in Germany. This is "competition", i.e. mostly from large domestic postal operators (Kiss et al., 2014)

In Hungary, the parcel and courier market was dominated by Magyar Posta until the mid-1990s, and then, after the opening of the market, new operators entered the market. TNT, UPS, DHL, FedEx were the first to emerge, followed by GLS, DPD, Trans-o-flex after the 2000s. Finally, there were Hungarian-owned companies specialising in the B2B sector and working only with domestic orders, such as Sprinter. Since the 2010s, specialisation has become the dominant factor, alongside acquisitions and changes of ownership (Diófási-Kovács - Szilágyi, 2019).

Activity and expansion of the companies in Hungary

DHL Express classifies its principal activity in the Supplementary Annex under Other postal and courier activities, which includes: road freight transport, other supporting transport services, customs clearance and cargo handling. It also offers a choice of export, import and domestic services for private individuals, with a choice of Same Day delivery, for less urgent parcels

¹⁸ <https://www.statista.com/chart/25845/market-capitalization-of-biggest-courier-companies>

between 1 and 3 days, or next day delivery for time-sensitive parcels. Next day deliveries, with a specific time interval, are not specified as being only available in Hungary.¹⁹

For business customers, the **Globalmail Business service** is available, under which DHL Express delivers large volumes of envelopes and parcels to its partners. It does this through its own network and in cooperation with local postal partners. This service is ideal for companies that want to reach a large number of people with a minimum of effort.

DHL Express also handles **Medical Express shipments**, i.e. medical and clinical shipments, which means the delivery of various samples to hospitals, laboratories, clinics or clinics for research and analysis. As I explained in the previous chapter, it makes sense to transport such shipments by air, and I think it would be possible, for example, to have a concept whereby DHL has a permanent customer base for this special service, for example, even in a German-Hungarian transport relationship.

Table 2. Key data on enterprises

| Title | DHL | UPS | GLS |
|--|-----------------------|------------------------|-----------------------|
| Time of foundation (Hungary) | December 1987 | June 2010 | April 1998 |
| Ownership structure | German parent company | Belgian parent company | German parent company |
| Registered office | Budapest | Vecses | Budapest |
| Company form | Ltd. | Ltd. | Ltd. |
| Air transport from Budapest airport (group of companies) | yes | yes | no |
| Number of parcel points | 14 | 1 | 1030 |
| Share capital (thousand HUF) | 4 000 | 4 510 | 30 000 |
| Number of employees (persons) | 258 | 141 | 473 |
| Balance sheet total (thousand HUF) | 4 990 2020 | 6 234 094 | 41 027 250 |
| Turnover (thousand HUF) | 19 855 870 | 30 977 165 | 57 609 882 |
| Profit after tax (thousand HUF) | 744 780 | 427 517 | 15 443 862 |

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing

The following activities are listed in the UPS Supplementary Annex: courier and other services; non-scheduled air transport; freight forwarding, data processing; other wholesale trade; other non-store retail trade; accounting, auditing and tax consultancy activities. UPS provides solutions for individuals and small businesses. By mode of delivery, it differentiates its services by volume, i.e. there are small-volume or occasional, large-volume and Freight deliveries. Freight services mean the transport of shipments over 70 kg by sea, air and land.²⁰ This factor should be taken into account in the analysis of the accounts, since while GLS and DHL are in fact only active in the CEP market, UPS does not only or does not separate its activities, as DHL does, where DHL Freight prepares its annual accounts separately. This is also important because the transport of parcels is at a higher price than that of individual parcels, for reasons that can be attributed to the mode of transport, the weight of the shipment, the type of shipment and any additional special permits required for its transport.

¹⁹ <https://mydhl.express.dhl/hu/hu/ship/delivery-services.html#/domestic>

²⁰ <https://www.ups.com/hu/hu/services/shipping.page?>

A specialised division of UPS can provide global transport and storage of medicines, medical devices, vaccines and medical equipment, for which UPS Healthcare was created²¹, which in Hungary, for example, provides warehousing and storage services, and its annual report is prepared separately, but UPS Hungary can provide the transport.

GLS's main activities are: parcel delivery in the Netherlands and abroad; freight forwarding, customs clearance; and other services related to freight forwarding, typically for domestic partners. With a network of 85 depots and a parcel control centre, GLS Hungary is available to customers throughout Hungary. The well-established network enables fast, seamless parcel delivery. Parcels are delivered the working day after dispatch. The centre, located near Budapest, also serves as an international parcel hub.²² Individuals and companies can also send shipments to GLS. For business shipments, domestic parcel delivery is also an option, where you can choose how quickly you want your shipment delivered. Interestingly, since GLS focuses on the European market, there is a separate business package for export deliveries to Europe, and there is also the SlovakiaExpressParcel service specifically for business customers who regularly ship in Slovakia.²³ This suggests that it is possible that GLS has a larger customer with business interests in Slovakia. Of course, this does not exclude that GLS will continue to deliver or receive parcels in third countries.

Revenue and expenditure structure

The evolution of the net sales revenue of all three companies shows some growth between 2015 and 2020, averaging 12% per year for DHL, only 7% for UPS and the highest growth for GLS, averaging 30% per year, almost equal to the 40% growth of the domestic parcel volume, so GLS is definitely the biggest domestic winner of the three companies in the e-commerce and parcel market. Of course, while volumes have increased, prices for services have also risen, but the industry-wide price increase has not been so large (0.67% on average per year) as to explain such a large increase in revenues alone. Again, the industry average should be used only as a guide.

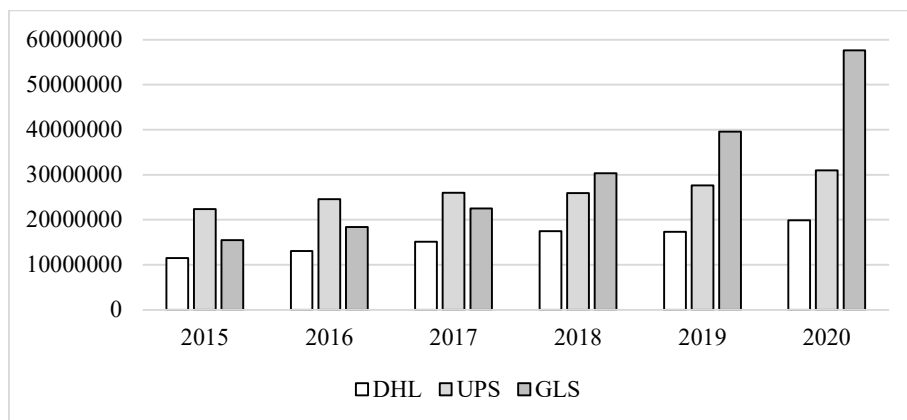


Figure 3: Evolution of net sales revenue for DHL, UPS and GLS (2015-2020)

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing
We have further examined the composition of net sales of sales. In the case of DHL, this composition is fairly stable, with net sales of 86% and 87% in each year, with the only decrease

²¹ <https://www.ups.com/hu/hu/healthcare/Home.page>

²² <https://gls-group.eu/HU/hu/vallalat/gls-hungary>

²³ <https://gls-group.eu/HU/hu/rendszeres-csomagfeladas/szallitas-menete/csomag>

in 2016 to 84%. This could also mean, for example, that there is a higher proportion of domestic partners who deliver parcels to private individuals, or to companies or foreign companies.

This stability of composition is less pronounced for UPS than for DHL. The first key observation is that UPS in Hungary, for example, had a very dominant share (more than 40%) of export sales until 2018. By 2020, it will represent only 26%. The increase in turnover was mainly due to an increase in domestic sales, i.e. it may have been possible to gain new business contacts at home. The most dramatic change in the sales ratio started in 2017-2018, when not only did export sales fall by 14%, but they also fell in the following years and did not increase in 2020.

GLS, like DHL, has the largest share of domestic sales, with 70% in 2015 and a steadily increasing trend to 81% of exports in 2020. However, other factors may dominate here compared to DHL. As we have seen before, its sales revenues have grown in direct proportion to the growth in parcel volumes in Hungary, and it also has a lot of domestic parcel points. This may imply that its partners are domestic business partners that deliver parcels to private individuals (i.e. the B2C sector). Another major business group is domestic companies that send parcels to Slovakia through the Slovakia express service, as mentioned in the previous chapter.

For export sales, both DHL and GLS highlight that most of their export sales are to EU partners in Europe, while UPS has links to several continents, with EU sales and post-import parcel compensations adding to their revenues. All this is an indicator that UPS's business model may involve processing orders through the parent company and its subsidiaries, who receive the full delivery charge for the package abroad and then remit UPS's share of the price, where it continues to deliver, to the domestic partner or private individual. DHL also separately accounts for the costs of its global network in Hungary that are incurred after the shipments transported by the Company leave the country (e.g. air freight costs, loading, delivery abroad) and for which there is no direct carrier obligation, but which are provided for by DHL's operations in Hungary.

Table 3: Expenditure structure for DHL, UPS and GLS (2015-2020)

| Company | Title | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------|-------------------------------|------|------|------|------|------|------|
| DHL | Material expenditure | 80% | 83% | 82% | 83% | 82% | 82% |
| | Personnel costs | 15% | 13% | 12% | 11% | 13% | 12% |
| | Depreciation and amortisation | 1% | 1% | 1% | 2% | 2% | 2% |
| UPS | Cost of materials | 96% | 96% | 96% | 95% | 96% | 96% |
| | Expenditure on staff | 3% | 3% | 3% | 3% | 3% | 3% |
| | Depreciation and amortisation | 0% | 0% | 0% | 1% | 1% | 0% |
| GLS | Cost of materials | 85% | 84% | 84% | 84% | 83% | 83% |
| | Personnel costs | 10% | 10% | 11% | 10% | 11% | 10% |
| | Depreciation and amortisation | 2% | 3% | 3% | 3% | 3% | 4% |

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing

The CEP market is a service-type market, where the presence of a subcontracting system and the outsourcing of services are particularly prevalent. On this basis, if we look at the above graph, we can see that for all three companies, the largest share is accounted for by material costs, although the composition of these costs varies: for DHL, 81% of costs are material and 12% are personnel costs, for GLS the same proportion is 84% and around 10% respectively, while for UPS, material costs have averaged around 95% over the years. The fact that this is higher at UPS, and that both depreciation (around 0%) and the ratio of personnel costs to total costs are around 3%, may also suggest that outsourcing of some work plays a greater role than at other companies.

On this basis, it is worth looking further at the material costs, the composition of which also confirms the fact that the three companies do not mainly operate with their own fleet and couriers. If this were the case, the cost of materials would be much higher, since, for example, the cost of fuel would be directly accounted for here. However, as the graph below shows, most of the costs are accounted for in the services used for DHL (98.44% on average), in the services sold (96.56%) for UPS and slightly split between the two types of services for GLS (84.7%-12.54%). This means that the impact of environmental factors affecting the sector (e.g. fuel price evolution) can be identified in the profit and loss accounts as indirect rather than direct influences.

Table 4: Structure of material costs for DHL, UPS and GLS

| Company | Title | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------|--|--------|--------|--------|--------|--------|--------|
| DHL | Cost of materials | 1,43% | 1,11% | 1,06% | 1,13% | 1,33% | 1,11% |
| | Value of services required | 98,06% | 98,48% | 98,61% | 98,56% | 98,33% | 98,47% |
| | Value of other services | 0,51% | 0,41% | 0,34% | 0,30% | 0,34% | 0,42% |
| UPS | Cost of materials | 0,31% | 0,29% | 0,21% | 0,25% | 0,16% | 0,19% |
| | Value of services purchased | 2,19% | 2,27% | 3,56% | 3,47% | 3,80% | 3,34% |
| | Value of other services | 0,07% | 0,07% | 0,07% | 0,05% | 0,05% | 0,05% |
| | Value of services sold (supplied) | 97,43% | 97,38% | 96,16% | 96,22% | 95,98% | 96,42% |
| GLS | Cost of materials | 2,09% | 2,02% | 1,77% | 1,74% | 1,77% | 1,78% |
| | Value of services purchased | 12,32% | 13,04% | 12,66% | 12,55% | 12,46% | 12,42% |
| | Value of other services | 0,61% | 0,56% | 0,54% | 0,46% | 0,45% | 0,40% |
| | Value of services sold (indirectly supplied) | 84,65% | 83,85% | 84,62% | 84,79% | 84,86% | 84,87% |

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing

How can we determine, or to what extent can we show, the impact of changes in various environmental factors on the performance of a company? How can companies be compared if they have very different revenue and expense structures in relative terms? For the three companies, we compared the change in revenue in the previous year with the change in the most typical type of expense (i.e. services purchased for DHL, while for UPS and GLS it was services sold through intermediaries).

Table 5: Year-on-year change in net sales and service charges

| Company | Results category (change compared to previous year) | 2015/2016 | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 |
|------------|---|-----------|-----------|------------|------------|-----------|
| DHL | Net turnover from sales | 13% | 16% | 16% | -1% | 15% |
| | Services purchased | 12% | 16% | 15% | -1% | 13% |
| UPS | Net revenue from sales | 10% | 6% | 0% | 7% | 12% |
| | Sales of services supplied | 10% | 5% | -2% | 7% | 12% |
| GLS | Net turnover from sales | 19% | 22% | 35% | 31% | 46% |
| | Sales of indirect services | 22% | 22% | 37% | 31% | 40% |

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing

If we look at the data in Table 5, we can see that the three companies have flexibility in their costs relative to their turnover. There is little difference (0% or 1-2% difference) between the percentage change in turnover and the percentage change in expenditure. The second most striking point is

that there was a big "dip" first at UPS from 2017 to 2018 and then at DHL from 2018 to 2019. Here, it is likely that there was a drop in turnover due to indirect effects, mainly due to a decline in automotive deliveries and production.

From 2015 to 2016, for all three companies, turnover did not increase very much and even though fuel prices decreased. Moreover, in the case of GLS, expenses were even 3% higher. One of the likely effects could have been the "extra workload" and the extra expenditure that came with the introduction of the new EKAER system.

In 2017-2018, DHL's revenue is also up by "only 16%", while UPS's is stagnating. GLS, on the other hand, has seen a further increase of 2% in expenditure compared to revenue. These years have seen a sharp rise in the price of kerosene and car fuel, which may be reflected in these figures. There was also a spectacular increase in labour costs. Interestingly, though, in the case of UPS, another factor that may also have had an impact is the fact that from 2016 they started a major investment, the construction of a new logistics centre in Vecsés, the idea being to have the UPS Hungary small package business and the freight business centres in a single facility. This was handed over in 2019. One positive outcome of this could be a 7% increase in revenue by 2019.

2019 was also a "weaker" year, particularly for DHL, where revenue fell by 1% year-on-year, and GLS, which grew by "only" 31%. This year, the environmental classification of vehicles has been tightened and the carbon dioxide emissions of a vehicle have been defined, which may have led to higher vehicle prices.

For 2020, DHL and GLS are also experiencing an increase in revenue and interestingly, this is followed by a much smaller increase in expenditure (although UPS also had a "revenue increase", but as I mentioned earlier, this was more from assets sold rather than the number of packages sold) This could be the opposite of two strong effects, as what we do know is that postal service prices increased by 9% this year and average fuel prices were also lower than the previous year.

Of course, the wage increase could also have contributed to the extent of the increase in the cost of services in an indirect way, but we thought it interesting to analyse its direct form separately because personnel costs are the second largest cost factor that weighs on sales revenue.

Although most of the activities are outsourced by the three companies, we cannot ignore the fact, for example, that they may have their own couriers and that they must have sufficient human capital to ensure that the service is provided and that the processes are of high quality. This is key for human resource management (Csehné et al, 2021). For all three companies, the wage ratio is low, below 10%, and the lowest is for UPS, where it is only 2% in any given year. The data are quite stable, with no real outliers or different values in any of the years. This could mean that CEP providers have a low contribution of their own labour to the generation of revenue, i.e. the nature of the service is not directly labour intensive.

Table 6: Payroll to revenue ratio for DHL, UPS and GLS (2019-2020)

| Company | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------|------|------|------|------|------|------|
| DHL | 10% | 9% | 8% | 8% | 9% | 9% |
| UPS | 2% | 2% | 2% | 2% | 2% | 2% |
| GLS | 5% | 5% | 6% | 6% | 6% | 5% |

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing

As average monthly wages within the industry have also increased year on year, we calculated the average per capita wages for each of the three firms for each year, based on various headcount and wage cost information.

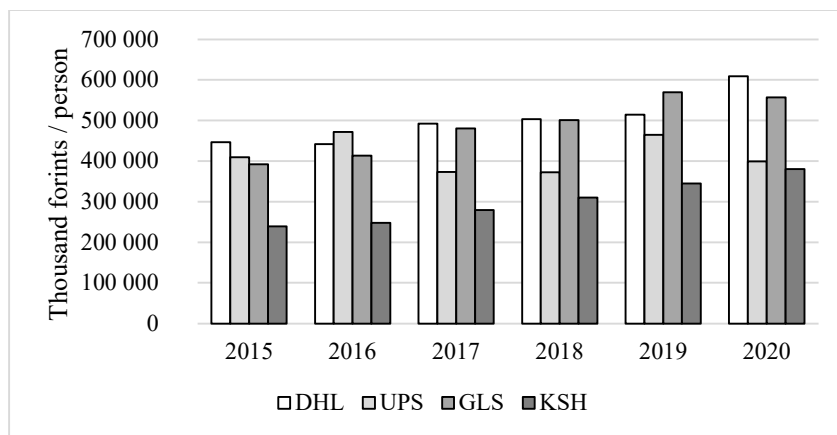


Figure 4: Evolution of average monthly wage per capita (2015-2020)

Source: Based on DHL Express, UPS and GLS annual reports 2015-2020, own editing

While for DHL and GLS we see average monthly per capita wages increasing almost in line with the industry average, for UPS in 2017 and 2018 they are "dramatically" lower than in 2015 or 2016. And yet, if we take the average of the five years, we cannot even say that this is due to a change in the proportion of manual workers, since at GLS, for example, the number of manual workers is around 50%, while at UPS it has been around 30% over the years.

Conclusions

Domestic parcel delivery companies are mainly subsidiaries of a global company, ensuring both international and domestic parcel traffic. As such, their receivables and payables include a large share of those of their affiliates and their ability to pay is highly dependent on the performance of these companies. This also provides stability, because debt settlements can be resolved within the company, which also gives these companies a degree of flexibility.

The CEP market is characterised by the fact that they outsource their services to other companies and do not mainly operate with their own fleet but subcontract, as evidenced by the structure of the expenses and the composition of the assets side of the balance sheet (not analysed in this study) of the profit and loss accounts of all three companies. Thus, changes in the global market (such as the increase in fuel prices or the EU motor vehicle regulation in 2019) are not directly reflected, but were an indirect effect on the evolution of the expenses. In addition, however, it was also found that they were able to be very flexible in their prices in relation to their costs, as revenues and expenses moved proportionally for all three companies.

In the case of the CEP market, the ability to react quickly to the market and thus to time an appropriate investment is of particular importance. We saw this already in 2015 with GLS, followed by DHL and UPS in 2016, with GLS continuing its major investments even further from 2018. These are mostly aimed at increasing efficiency by reducing costs or further expansion, for example when GLS started to further increase the number of its parcel points. In terms of a positive change in profitability, both UPS and DHL have seen successful investments in previous years. Although the three companies are engaged in the same activities, the structure of their expenditure differs greatly. In other words, the different customer base, customer mix, service mix and types of delivery have an impact on the structure of costs. DHL and UPS have a higher ratio of expenses to revenues, which also keeps their profitability levels lower than GLS. The reasons for this are likely to be that DHL and UPS may have a higher proportion of air shipments, which have higher costs, and UPS is further exacerbated by the existence of Freight services, because the cost of trucking freight is higher than, for example, multiple packages, especially

internationally, where freight rates may be even higher due to distances or compliance with various international regulations.

Wage-related trends have an impact on the three companies mainly indirectly, due to the nature of the service itself, it can be said that it is not a labour-intensive sector in a direct way (Lipták - Musinszki, 2021). Wage increases within the industry can be observed in all three companies directly in the case of wage-related expenditures, and could also be obviously involved in the development of intermediated/other services.

Acknowledgement

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References

- Courier, Express and Parcel (CEP) Market (2022): Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2022-2027.
<https://www.researchandmarkets.com/reports/5547114/courier-express-and-parcel-cep-market-global>
- Csehné Papp, I., Nagy, Cs., Karácsony, P. (2021): Az emberi erőforrás menedzsment szerepe a fenntartható fejlődésben. Észak-magyarországi Stratégiai Füzetek, 18(3), pp. 103-112.
<https://doi.org/10.32976/stratfuz.2021.45>
- Diófási-Kovács, O., Szilágyi, S. (2019): A Magyarországon működő CEP szolgáltatók széndioxid kibocsátásának komparatív elemzése. Műhelytanulmány (176.). Budapest: Budapest Corvinus Egyetem Vállalatgazdaságtan Intézet. http://unipub.lib.uni-corvinus.hu/4157/1/Diofasi_Szilagyi_176.pdf
- Esser, K. Kurte, J. (ed.) (2021): Analyse des Marktes in Deutschland : Möglichmacher in bewegten Zeiten. Bundesverband Paket und Expresslogistik e. V.
<https://www.biek.de/files/biek/downloads/papiere/BIEK KEP-Studie 2021.pdf>
- Kawa, A., Rózycki M. (2018): CEP market in Poland.
<https://www.researchgate.net/publication/329519151 CEP market in Poland>
- Kiss, K. M. et al. (2014): Piacnyitás, piaci verseny és piaci stratégiák – Az inkubens postai szolgáltatók stratégiaiválaszai az egyetemes postai szolgáltatások liberalizációjára. Budapest: MTA KRTK KTI Kutatási jelentés.
https://www.gvh.hu/data/cms1029375/Vkk_palyazat_2013_6_tanulmany.pdf
- Lipták, K., Musinszki, Z. (2021): Local employment development and sustainable labour market in Northern Hungary since the regime change. VISEGRAD JOURNAL ON BIOECONOMY AND SUSTAINABLE DEVELOPMENT 10(2), pp. 56-61.
- Lipták, K., Musinszki, Z. (2022): Impact of teleworking on shopping habits during the COVID-19 pandemic in Hungary. JOURNAL OF INTERNATIONAL STUDIES 15(3), 186-200.
- Mazur, M. et al. (ed.) (2019): Five Forces Transforming Transport & Logistics PwC CEE Transport & Logistics Trend Book 2019.
<https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/transport-logistics-trendbook-2019-en.pdf>
- Okholm, H. B. et al. (2013): E-commerce and delivery - A study of the state of play of EU parcel markets with particular emphasis on e-commerce.
<https://www.copenhageneconomics.com/dyn/resources/Publication/publicationPDF/8/238/0/E-commerce-and-delivery.pdf>

- Pitney Bowes (2021): Parcel shipping index 2021. 3. pitneybowes.com:
<https://www.pitneybowes.com/content/dam/pitneybowes/us/en/shipping-index/parcel-shipping-index-ebook.pdf>
- Szegedi, Z., Prezenszki, J. (2017): Logisztika-Menedzsment. Budapest: Kossuth Kiadó.
- Szemán Judit - Pleszkó Renáta (2021): Tőkeszerkezeti kérdések a magyarországi vállalatok esetén 2015-2018 között. Észak-magyarországi Stratégiai Füzetek, 18(különszám), pp. 116-125. <https://doi.org/10.32976/stratfuz.2021.10>
- World Economic Forum (2018): Delivering the Goods: E commerce Logistics Transformation.
http://www3.weforum.org/docs/WEF_Delivering_Goods_E_commerce_logistics_transformation_report_2018.pdf
- <https://gls-group.eu/HU/hu/vallalat/gls-cegcsoport>
- <https://www.statista.com/chart/25845/market-capitalization-of-biggest-courier-companies>
- <https://www.gep.com/blog/mind/european-cep-market-and-carriers-pricing-trends>
- <https://mydhl.express.dhl/hu/hu/ship/delivery-services.html#/domestic>
- https://mydhl.express.dhl/hu/hu/ship/delivery-services.html#/business_solutions
- https://mydhl.express.dhl/hu/hu/ship/delivery-services.html#/business_solutions/medical_express
- <https://www.ups.com/hu/hu/services/shipping.page?>
- <https://www.ups.com/hu/hu/healthcare/Home.page>
- <https://gls-group.eu/HU/hu/vallalat/gls-hungary>
- <https://gls-group.eu/HU/hu/rendszeres-csomagfeladas/szallitas-menete/csomag>

Zsanett Zsigó²⁴

Sustainable water management and local communities: strategies and case studies to achieve SDG 6 in Hungary

Climate change affects all areas of our lives, especially the quality and quantity of water. The 6th goal of the Sustainable Development Goals deals with problems affecting water, and among its goals, local communities are also given a significant role, just like in the European planning documents. These documents promote sustainable water management solutions that enable integrated and cost-effective interventions. In this paper, I am looking for the answer to how sustainable water management solutions can contribute to the fulfilment of SDG 6 and what effects they have on local communities. In addition to the relevant literature and document review, I conducted expert interviews with specialists who were already involved in such projects and I analyse three case studies with sustainable water management solutions. Results show that these solutions have a significant impact not only on the physical natural environment, but also on residents' habits and they have a strong identity-forming role, so they are suitable to contribute to the fulfilment of SDG 6.

Keywords: Sustainable Development Goals, water affairs, sustainable water management, local community, local development

JEL Codes: Q01, Q25

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Introduction

Based on data from the United Nations, over the past 300 years, over 85% of the planet's wetlands have been lost and more than 700 million people were living in countries with high and critical levels of water stress in 2019 (UNESCO, 2019). According to a global assessment of the impact of climate change on water scarcity (Gosling and Arnell, 2016), it is possible that 53% of the global population will suffer from water scarcity. Since the launching of the Sustainable Development Goals (SDGs) in 2015, governments, local authorities, NGOs and businesses are making serious efforts to meet them. SDG 6 (clean water and sanitation) addresses targets directly related to water issues. Although Hungary is called the "country of waters", water scarcity problems in the country are set to increase in the coming years, making it crucial to address SDG 6; for example, flood protection problems, summer droughts and municipal water problems requiring immediate action by the authorities. In this paper, I am looking for the answer to how sustainable water management solutions can contribute to the fulfilment of SDG 6 and what impacts they have on local communities in Hungary.

My paper is based on qualitative methodology, starting with a comprehensive analysis of relevant literature and an assessment of existing policies. I conducted two semi-structured interviews with experts on the field. These experts work for the Association of Climate-Friendly Municipalities and have been involved in several sustainability-related projects, in particular projects promoting sustainable water management solutions in Hungary. Finally, I also analyse three case studies that are truly forward-looking and contribute to the SDGs as small-scaled developments, and I show the benefits of these solutions for local communities in the light of the interviews.

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Sustainable urban water management in the light of international agreements

Introduction of SDG 6

In the 20th century, the phenomenon of sustainability became extremely important (Popescu et al., 2017). Sustainability has many interpretations, and a comparison of these would be worthy of a separate study; e.g., there are strong and weak views of sustainability (Kerekes, 2008). One definition is that sustainability is economic growth that provides opportunities for all the inhabitants of the Earth without exploiting the Earth's resources (Pronk and Haq 1992). This definition introduces the principle of intragenerational solidarity into territorial development, which adapts the definition of the 1987 Brundtland report (WCED, 1987) to include the requirement of solidarity between all those living at the same time: "Sustainable development is development that meets the needs of those living here without compromising the ability of those living elsewhere to meet their needs" (Fleischer 2014, 16). Sustainability has three main pillars (the triple bottom line): society, economy and environment; they cannot be interpreted without each other (Gyulai, 2000), and they are embedded and closely interacting with each other (Fleischer 2014, Tóth and Kozma, 2016).

Over time, the issue of sustainability has also been included in international agreements. The Millennium Development Goals (MDGs) were adopted in autumn 2000 (UN, 2000), but they focused on poverty reduction rather than sustainability (Waas et al., 2011; Jancsovszka, 2016). The development of the Sustainable Development Goals (SDGs) was led by the UN mid-term review conference on the MDGs and the Rio 2012 Earth Summit. The SDGs consist of 17 general goals, which can be further broken down into sub-goals, all focusing on different aspects of sustainability. The goals cover both the social and environmental dimensions of sustainability, but there are also economic objectives (e. g. Goal 8). The SDGs can be understood as networks, linked by their sub-goals and targets (Le Blanc, 2015). A general problem with the SDGs is the lack of sufficient policy integration to address sustainability issues effectively (Jancsovszka, 2016). Many of the current debates on the SDGs are about the measurability of the goals and the production of data, as continuous monitoring would be needed with systematic and consistent data production (Benedek, 2021).

Water is an essential, vital resource for humanity and the last century has caused serious damage to the state of our waters, including in Europe (Reich, 2019). SDG 6 addresses water-related targets and indicators and it has eight specified targets (UN). Although the targets are indeed focused on important areas of water consumption and are comprehensive, it is notable that some raise serious questions about feasibility and measurability. However, addressing SDG 6 is crucial because without taking water issues into account, other goals will remain unachievable (e.g., SDG 15 – Life on Land) (Dombrowsky et al., 2016).

In this paper, I focus on the national-level feasibility of the following objectives:

- Target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate;
- Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;
- Target 6.a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies;
- Target 6.b: Support and strengthen the participation of local communities in improving water and sanitation management.

As we can see, these targets can be addressed on local (urban) levels very well, whether with small or large-scale investments. The place-based narrative for development was given a prominent role in the EU's 2014–2020 programming cycle, as they realised the importance of the potentials of local communities (Pfeil, 2020). The EU Water Framework Directive and the rules on circular

economy highlight the need for integrated management of water issues, and hydrological problems linked to climate change (e. g. flash floods) are having a disproportionate impact on local communities. For these reasons, an integrated approach to water by municipalities is an essential part of climate change adaptation and mitigation (Szöllősi-Nagy, 2018, Balatonyi et al., 2021). For these reasons, the focus in this paper is on local strategies and local solutions.

The introduction of water affairs in further strategies

2015 was a particularly remarkable year for sustainability (Karajz and Kis-Orloczki, 2019). In December 2015, the Paris climate agreement was signed after issuing the Agenda 2030 in September 2015 (Dombrowsky et al., 2016). The agreement clearly shows that climate change will have a significant impact on water resources and it gives climate change adaptation the same priority as mitigation. However, water-related issues are not highlighted enough, even though climate change shows its most direct impact through water. In line with the Paris agreement, the European Union committed to becoming climate neutral by 2050 (EC, 2022).

The United Nation's Climate Action Pathway – Water (2021) sets out more specific visions for water-related issues. This highlights the necessity of sustainable water management in agriculture, industry and settlements. There is an emerging need to conserve water ecosystems and to enhance biodiversity; "Half of all freshwater ecosystems and inland waters, particularly those that have the greatest potential to sequester carbon, such as wetlands, peatlands and mangroves, are protected and restored" (UNFCCC 2021). The document also states that climate change is primarily manifested through water and establishes milestones until 2040 which have economic, social and environmental implications; special attention is given to cooperation with civil society organisations and communities through pilot programmes.

The European Water Framework Directive was adapted in 2000, and since then this has been the primary law for water protection in the European Union. The Directive emphasises that increasing population, urbanisation and economic activities are putting significant pressure on freshwaters in Europe. The Directive highlights the need for cooperation between neighbouring countries to manage together their shared waters (e.g., rivers), because pollution spreads across borders. The review of the Directive in 2019 (Fitness Check) shows that the Directive had an exceptionally good impact on water protection and flood risk management, but further development is needed. Monitoring is also limited because municipalities do not have enough resources (financial and technical) for this purpose (Rivas et al., 2022). The Water Framework Directive is supported by many more specific directives.

Water affairs in Hungarian regulation

The protection of water appears in the Fundamental Law of Hungary as a common heritage to be preserved. The Kvassay Jenő Plan (the national water strategy), adopted in 2017, integrates the Sustainable Development Goals (Reich, 2019). The main objectives pursued by the plan are improving water quality, increasing water efficiency, implementation of integrated water management on all levels, protecting aquatic ecosystems, international cooperation and supporting the participation of local communities. The plan is also in line with EU water policy, in particular the Water Framework Directive and the Floods Risk Management Directive. The Plan states that local municipalities and water-utility companies have the most significant role in municipal water management. The vision for 2030 includes having enough water available for users, focusing on prevention of damage caused by water than protection against it and upgrading the quantity and quality of exploitable water resources to a good status. The long-term goals already include soft targets such as improving the relationship between water and society, which could include local communities, but they are not given a prominent role in the rest of the plan. However, the Plan emphasises that the partnership of local communities can help to coordinate the use of VP, KEHOP and TOP funds.

Since 2019, municipal water management has been a priority in the activities of the General Directorate of Water Management (Balatonyi et al., 2021). Local authorities should rely on their Integrated Urban Water Management Plans, which are the basic documents for local urban water management (Reich, 2019). The purpose of this document is to integrate economic and environmentally supportive, sustainable water management tasks and their foundations into a coherent, operational system.

Sustainable water management solutions in the service of communities

Understanding sustainable and integrated water management solutions

As we have seen in the previous section, sustainable, integrated water management solutions are desirable to achieve international and national water goals, involving local communities and society. We must realise that it is getting more and more difficult to meet the growing water demand of the population with conventional water management solutions (Bahri, 2012), so it is necessary to examine and address local needs and problems related to water. In urban planning, professionals are increasingly confronted with the problem that water as an environmental element is not available in a sufficient quantity or quality (Gayer and Ligetvári 2007). Integrated urban water management is about how settlements can manage water and water-related infrastructure and services in a sustainable way. The principles of integrated urban water management are recognising the importance of alternative solutions, understanding storage, distribution and treatment as a cycle, and addressing economic efficiency, social equity and environmental sustainability at the same time.

Sustainable water management solutions (SWMSs) provide a tool to balance water demand and availability (Ding and Ghosh, 2017). According to Darvay et al. (2021), sustainable water management systems are those that function in accordance with society's needs for now and in the future, while they preserve the ecological, environmental and hydrological integrity. The Water Foundation's definition says that "Sustainable water management means using water in a way that meets current, ecological, social, and economic needs without compromising the ability to meet those needs in the future" (Myatt et al., 2019, p. 3). In the past years, governance and cultural adaptation is a crucial concern (Pahl-Wostl, 2008). Catley-Carlson (2012) highlights that water management starts on a local level, as the local water management reflects the country's, region's or village's characteristics like culture, religion and geography. It is also essential that water solutions must be adapted locally to be successful, and sharing data, information and best practices is crucial. The methods and technologies can be designed locally, but they are more valuable if they are built on the experience of others, underlining the need to share good practices. These solutions require a decentralised approach, which has many positive effects on the infrastructure, environment and local communities; they are able to promote innovation, support a more efficient use of resources and have a good impact on the local community's well-being (Marlow et al., 2013). According to Cosgrove and Loucks (2015), the question of centralisation is almost irrelevant, because it is particularly desired that local systems be part of larger physical and institutional contexts and the choice must be based on economic analysis.

Positive impacts of SWMSs on local communities

Bottom-up approaches are particularly important in the pursuit of the SDGs (Szép et al., 2019). However, results of Karajz and Kis-Orloczki (2019) shows that during social innovation, natural elements are marginalised. At the same time, the reviewed documents and literature also suggests that local communities and NGOs should be involved in sustainability efforts in both mitigation and adaptation, but this social aspect of SWMSs is not properly represented in the academic literature. Research from Mali shows that institutions must be flexible to adapt the needs of local communities in water management and it is necessary to ensure interactive communication between socially diversified stakeholders (Gleitsmann et al., 2007). Stakeholder engagement is a key factor for the success of SWMSs because it provides methods and solutions to a variety of

challenges in order to achieve the desired goal (Megdal et al., 2017). In addition to communication, ongoing education is equally important (Ostrom, 1990; Uphoff, 1992; Gleitsmann et al., 2007; Fernald et al., 2012; Spence et al., 2018); knowledge is passed down from generation to generation in local communities, so training local farmers is fundamental for climate adaptation (Fernald et al., 2021). These learning processes can shape the identity of local communities (Pahl-Wostl et al. 2008). Another study from the UK shows that projects with high degrees of social capital are more likely to have an impact on the social and environmental objectives of the public sector (Berka and Creamer, 2018).

Introduction of LIFE LOGOS 4 Waters and LIFE-MICACC projects

I have analysed two projects funded by the LIFE programme of the European Union and co-financed by the Hungarian State (Ministry of Interior), these projects are LIFE-MICACC and LIFE LOGOS 4 WATERS. The primary implementer of the project is the Ministry of the Interior, but they also work together with many organisations, such as WWF and the Association of Climate-Friendly Municipalities. The LOGOS project is focusing on natural water retention measures (NWRM), and one of their targets is to develop 20 small-scale NWRMs (Ministry of Interior, 2021). One of the goals of the project is to provide methodology for the Integrated Urban Water Management Plans. However, as this project is ongoing, there are no significant results so far (the project started in 2021 and will end in 2025), so I will present case studies from the LIFE-MICACC project, which also focused on NWRMs, but has already finished.

These projects have been included in the UN Partnership Platform, which states that the LIFE-MICACC project contributes to SDG 6 and SDG 13 (climate action). The project's title is "Municipalities as integrators and coordinators in adaptation to climate change" and it aims to improve the climate resilience of five vulnerable municipalities in Hungary through ecosystem-based NWRMs. They have created prototype projects to see if these solutions can be adapted and replicated in other Hungarian settlements. The project was successful, it has improved the climate resilience of the involved municipalities and made them more resistant to damage caused by water (Ministry of Interior, 2022). Monitoring was also carried out in the model plots with ecological and hydrological monitoring activities (Pataki et al., 2021). Throughout the implementation of the projects, particular attention was paid to communication and the continuous involvement of the residents.

The LIFE-MICACC project also invests heavily in improving ecosystem services (supply, cultural and regulatory services) (Ministry of Interior, 2021). Wetlands were created in all five municipalities involved, making the neighbourhood more liveable, providing recreational opportunities (e. g. fishing) and helping visitors to learn about climate change and sustainable water management solutions. I have chosen to analyse three case studies out of the five projects, because my goal was to present interventions with a particularly strong social impact.

The impact of SMWs on local communities in the light of LIFE projects based on expert interviews

To get a comprehensive picture of the impacts of SWMSs on local communities, I conducted two semi-structured expert interviews (in April 2023) with staff from the Association of Climate-Friendly Municipalities and analysed the case studies through these interviews. These experts are working as a project manager and a professional adviser and have been involved in several national sustainability-related projects. Local communities are given a special role in their work, and social consultation and education also fall within their remit. The Association is an active participant in the LIFE and LOGOS 4 Waters projects in Hungary, which adapt sustainable water management solutions, more specifically natural water conservation solutions. The main purpose of the interviews was to explore the social impacts of sustainable water management solutions

(which are under-represented in the scientific literature) through the experiences of the experts. My questions focused on the difficulties that local societies faced with water issues before the interventions presented, and the impacts of the interventions on local communities.

The expert interviews provided rich source of information on the social impacts of SWMSs. In Hungary, EU projects such as LIFE and LOGOS provide SWMSs for municipalities with a particular focus on natural water retention solutions. According to the interviewees, one of the most important benefits is that these solutions increase the sensitivity and awareness of the local community about environmental protection, generally through locally hosted events and locally distributed publications that raise public awareness about climate change and mitigation or adaptation options. This is line with the literature, which emphasises the necessity of education (Ostrom, 1990; Uphoff, 1992; Gleitsmann et al., 2007; Fernald et al., 2012; Spence et al., 2018). In the settlements involved, it can be observed that people are already experiencing climate change (they sense heat waves, the reduction in the volume of harvests in agriculture), even if they have limited knowledge about the causes. Local solutions also improve people's relationship with the landscape and their use of landscape through shaping the community's attitudes. It can also be observed among the population of the municipalities implementing the projects that the project has a local identity-forming effect, that is embedded in people's mental maps, and they feel more ownership of the developments than in the case of traditional water management solutions. This phenomenon is also supported by research that took place in 2015 (Czirfusz et al., 2015), which says that people's attitudes towards climate change depend heavily on the media, but personal perceptions have much greater power. Local identity and community resilience is correlated according to recent research in terms of environmental hazards (Sobhaninia et al., 2023) which makes this identity-forming effect extremely important.

Attitude formation also has a positive impact on the people's everyday habits. These habits include very basic changes in human behaviour; this change manifests, for example, through littering; the previously uninterested population no longer throws rubbish away, and even picks it up after others. This is also linked to the fact that the population is much more attentive to the developments that have been made with their involvement. It is also important to note that the relationship between water and population significantly improved in the involved settlements (underpinning the Kvassay Jenő Plan), in that people no longer see water as an asset or a threat, but as a value which needs to be preserved and protected. Consequently, water use is also improving, for example by reducing the use of piped water for irrigation and increasing rainwater collecting and retention at the properties. These practices also have a positive impact on people's budget, as watering with rainwater or well water is free of charge, so they can save on the cost of piped water.

Community building is also an explicit benefit of sustainable water management. During the implementation of the projects, there are several events involving local population organised by the Association or the Ministry of Interior. In addition to raising awareness, these events allow people express their views on local needs and developments, so they can easily get to know like-minded neighbours and start a discussion. This phenomenon is also supported by the literature, which says social capital is needed for decision-making processes, especially in environmental cases, and this social capital is generated through the events of the community (both formal and informal) (Ostrom, 1990; White and Runge, 1995). When the people are proud of the implemented projects, they will have the confidence to put pressure on decision-makers, and they are more likely to apply for further opportunities in the future. According to the interviews, mayors have a privileged role in adaptation and mitigation; if the mayors show the will to act, they are seen as a role model by the local population. The community experience is also built around the completed projects; when recreational spaces are created, people are keen to use them for leisure activities and participate in the maintenance activities.

The experts state that changes in the physical (built) environment also have a significant impact on the population and they will be willing to make physical changes on their own property. An example of this can be seen in cases where the aim is to preserve natural, green vegetation rather than completely artificially covered yards, as the benefits of green cover and permeable paving, for example against heat stress are recognised. These solutions, which can be done at home, improve biodiversity and provide a better living environment in a very simple way, which improves the general well-being of the population (Andrade et al., 2021).

Case studies on sustainable water management in Hungary

Bátya – Adapting to climate change by rainfall management

Bátya is a settlement of nearly 2000 inhabitants in the Kalocsa District. The area is one of the regions with the hottest temperature in Hungary (Pataki et al., 2021). The main problems in the area are periods of drought (which regularly damages local agriculture) and heavy rainfalls, so the solution is to store the water that falls during a heavy rainfall. A multi-basin stormwater reservoir with a capacity of 11,000 m³ has been created in the settlement, where a shallow area suitable for habitat has been created in addition to the permanent water surface (Veres et al., 2021). There is also a canal in the area that can be used for occasional water replenishment. Overall, local water supplies have increased, helping to bridge the gap between heavy rains and droughts.

The social impact of the project is significant. This is supported by the interviews and by a report on the socio-economic impact of the project (Számadó and Húgyecz, 2021). Perceptions of water have improved in the municipality and among the public, and the project significantly increased knowledge about climate change and SWMSs, which is in line with the importance of education (Fernald et al., 2021). Now the municipality has the knowledge to communicate a green approach on a longer term. Residents can sense the improvement in the local microclimate, biodiversity is increasing, and people are able to use the previously neglected area for recreation purposes, which has a beneficial effect on strengthening the social capital through informational events (White and Runge 1995; Weinberger and Jüttig, 2001).

Püspökszilágy – Adaptation to climate change with flood protection based on runoff slowing and water retention

Püspökszilágy is a village in Pest County with just over 700 inhabitants at the junction of the Gödöllő hills and Cserhát region, and there is also a watershed of the Danube and Tisza rivers (Pataki et al., 2021). The main problem of the village is that flash floods are an increased threat to the settlement and have caused a lot of material and financial damage to the residents over the years, but they also have to cope with periods of drought. Addressing both problems simultaneously means slowing down the run-off and creating a reservoir for rainwater. These solutions have helped to reduce the risk of flash floods in the village (there has been no water damage in the village since the project was implemented) and to supply water to a previously water-scarce area, thereby improving the microclimate.

Residents of Püspökszilágy are proud of the village's long-term thinking on climate change, which is an example for them and other municipalities (Számadó and Húgyecz 2021). The municipality has a very significant role in the awareness raising of residents; they are able to show them how to fight climate change and how to protect themselves from water damage and water scarcity. According to the interviews, local identity has been strengthened after the intervention through many formal and informal events in the town, which contributes to the increase of the community's social capital (White and Runge, 1995; Weinberger and Jüttig, 2001); the experts highlighted the strong personality of the mayor, who has a huge influence on the thinking of residents on climate change. The increasing biodiversity and the recreational opportunities have contributed to the well-being of the residents.

Tiszatarján – Sustainable management and riverside water retention for climate adaptation

Tiszatarján is located in Borsod-Abaúj-Zemplén County, along the river Tisza, in one of the most disadvantaged areas in Hungary, with a population of nearly 1400 inhabitants. The community is facing several challenges: inland flooding, droughts and river flooding are also problems in the village. They also have to contend with invasive plants, which both degrade biodiversity and reduce flood protection. The municipality also has a pond (Bivalyos tó), where the municipality grazes water buffaloes and there is significant aquatic vegetation (Veres et al., 2021; Pataki et al. 2021). The aims of this municipality were to increase the bioenergy production, water retention, semi-natural grazing and promotion of ecotourism (Veres et al., 2021). To achieve these goals, they have created small-scale natural water retention solutions by creating open water surfaces in the floodplain. The solution involved the rehabilitation of the pond, increasing the water retention capacity in the area and reducing invasive plant species. A nature trail has been created around the pond to improve ecotourism, where a number of information panels have been installed. With the biomass produced sustainably in the area, the model has become economically sustainable and provides heating fuel for the municipality.

Residents' perception of the project is remarkably positive (Számadó and Hugyecz, 2021; Pataki et al. 2021). The project has given the municipality the motivation to look for new opportunities for the village to address sustainability and climate change. According to the interviews, the municipality is an active participant in the Association's activities. However, the municipality perceives that due to the disadvantaged situation of the area, it is much more difficult to transfer knowledge and communicate to the residents, which they want to solve by starting to shape attitudes among the children and continuously organising events on the topic. This is particularly important, because marginalised communities are extremely vulnerable to the effects of climate change (Otto et al., 2017; Patnaik, 2021). The new learning trail also offers an opportunity to shape the children's attitudes, where teachers are happy to take students to learn about nature, as they can get to know plants and animals up close. The trail has had a really good impact on local tourism; tourists like to visit the trail to see the buffalo as well as the natural environment. It makes the residents proud that they have been able to get involved in tourism along the Tisza, which is in line with the identity-forming role of the project.

Summary

SDG 6 deals with the management of water-related problems from among the sustainable development goals, but at the same time it must be seen that without its fulfilment, other goals are also unattainable, since water plays a significant role in all aspects of our lives. Water is also included in European planning documents, and local communities play an important role in both SDGs and European documents. In these documents, sustainable and integrated water management solutions are crucial, which can also be implemented as small-scale developments, and their great advantage is that they are also suitable for involving the local community. In Hungary, the main document for water affairs is the Kvassay Jenő Plan; the document is in line with the SDGs and main European regulations; however, it does not give as much emphasis to local communities as SDGs do.

Sustainable water management solutions are a great way to address water problems and handle climate change. These solutions allow all decision-making levels to be integrated into developments and help to implement environmentally friendly interventions. It is a significant fact that these solutions bring many benefits to the local community; according to the literature and expert interviews, they promote the acquisition of knowledge regarding both climate change and water use, they offer money-saving opportunities, they help make the living environment and the settlement more liveable, and they also provide recreational opportunities, all of which contribute to the well-being of the residents.

The presented case studies belong to the LIFE-MICACC project, which has also been added to the UN Partnership Platform, recognizing that it contributes to the fulfilment of SDG 6 and SDG 13, but we can observe this in the case studies. The case studies support the results of the literature analysis and the interviews, which say sustainable water management solutions can indeed improve the population's chances against climate change and improve local communities, not only the physical and natural environment. Based on the interviews and the literature, the municipalities involved in the project are much more likely to take steps against climate change and with the adapted small-scale solutions, the marginalised communities are also participating in the process through continuous involvement. The main lesson from the interviews is that the continued presence and education associated with the projects does indeed increase the local identity of the communities, social capital and community resilience. It is also important to recognise that mayors can act as role models for action on climate change. These characteristics make sustainable water management solutions suitable to contribute to the fulfilment of SDG 6.

References

- Andrade, R., Hondula, D. M., Larson, K. L., & Lerman, S. B. (2021). Landscaping preferences influence neighborhood satisfaction and yard management decisions. *Urban Forestry & Urban Greening*, 59, 126983. <https://doi.org/10.1016/j.ufug.2021.126983>
- Bahri, A. (2012): Integrated Urban Water Management. Global Partnership Technical Committee. The background papers, No. 16.
- Balatonyi L., Reich G., Jancsó B., Nagy Z., Buzás K., & Tóth L. (2021): Fenntartható települési vízgazdálkodás, jövőkép a települések részére. *Belügyi Szemle*, 69(12), 2189–2207. <https://doi.org/10.38146/BSZ.2021.12.8>
- Benedek J. (2021). Fenntartható fejlődés: Banális metaforától korunk meghatározó területfejlesztési paradigmájáig. *Észak-magyarországi Stratégiai Füzetek*, 18(3), 4–14. <https://doi.org/10.32976/stratfuz.2021.39>
- Berka, A. L., & Creamer, E. (2018). Taking stock of the local impacts of community owned renewable energy: A review and research agenda. *Renewable and Sustainable Energy Reviews*, 82, 3400–3419. <https://doi.org/10.1016/j.rser.2017.10.050>
- Catley-Carlson, M. (2012): Why Water Management Starts at the Local Level. *UN Chronicle*, No. 1 & 2 Vol. XLIX. Downloaded: 12 May 2023. Source: <https://www.un.org/en/chronicle/article/why-water-management-starts-local-level>
- Cosgrove, W. J., & Loucks, D. P. (2015). Water management: Current and future challenges and research directions. *Water Resources Research*, 51(6), 4823–4839. <https://doi.org/10.1002/2014WR016869>
- Czirfusz, M., Hoyk, E. & Suvák, A. (edited) (2015): *Klimaváltozás –társadalom –gazdaság. Hosszú távú területi folyamatok és trendek Magyarországon*. Publikum Kiadó, Pécs.
- Darvay, S., Nemcsók, J. & Ferenczy, Á. (2016): Fenntartható fejlődés. *Polgári Szemle: Gazdasági és Társadalmi Folyóirat*, 12 (4-6). pp. 88-104.
- Ding, G. K. C., & Ghosh, S. (2017): Sustainable Water Management—A Strategy for Maintaining Future Water Resources. In M. A. Abraham (Szerk.), *Encyclopedia of Sustainable Technologies* (o. 91–103). Elsevier. <https://doi.org/10.1016/B978-0-12-409548-9.10171-X>
- Directive 2000/60/EC of the European Parliament and of the Council (2000). Downloaded: 12 May 2023, Source: <https://eur-lex.europa.eu/eli/dir/2000/60/oj>
- Dombrowsky, I., Bauer, S. & Scheumann, W. (2016). What does the Paris climate agreement mean for water policy? Download: 11 2023 May. Source: <https://www.idos-research.de/en/the-current-column/article/what-does-the-paris-climate-agreement-mean-for-water-policy/>

- EC (2006): Official Journal of the European Union. Downloaded 12 May 2023. Source: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX%3A32006L0118>
- Fernald, A., Tidwell, V., Rivera, J., Rodríguez, S., Guldán, S., Steele, C., Ochoa, C., Hurd, B., Ortiz, M., Boykin, K., & Cibils, A. (2012): Modeling Sustainability of Water, Environment, Livelihood, and Culture in Traditional Irrigation Communities and Their Linked Watersheds. *Sustainability*, 4(11), Article 11. <https://doi.org/10.3390/su4112998>
- Fleischer T. (2014): A fenntarthatóság fogalmáról. In: Köszolgáltat és fenntarthatóság. Nemzeti Köszolgáltatási Egyetem, Budapest, pp. 9-24. ISBN 978-615-5491-64-1
- Gayer J., Ligetvári F. (2007): Települési vízgazdálkodás – Csapadékvíz elhelyezés. Környezetvédelmi és Vízügyi Minisztérium, Budapest.
- Gleitsmann, B. A., Kroma, M. M., & Steenhuis, T. (2007): Analysis of a rural water supply project in three communities in Mali: Participation and sustainability. *Natural Resources Forum*, 31(2), 142–150. <https://doi.org/10.1111/j.1477-8947.2007.00144.x>
- Gosling, S. N., & Arnell, N. W. (2016). A global assessment of the impact of climate change on water scarcity. *Climatic Change*, 134(3), 371–385. <https://doi.org/10.1007/s10584-013-0853-x>
- Gyulai I. (2000): Fenntartható fejlődés. Miskolc, Ökológiai Intézet a fenntartható fejlődésért Alapítvány, p. 109.
- Jancsovszka P. (2016): Fenntartható Fejlődési Célok (Sustainable Development Goals). *Tájökológiai lapok* 14 (2): pp. 171-181.
- Karajz, S., Kis-Orloczki, M. (2019): A fenntartható fejlődés és a társadalmi innováció kapcsolata, kapcsolatának mérése. *Észak-Magyarországi Stratégiai Füzetek*, Vol. XVI./1. pp. 36-47.
- Kerekes, S. 2008: A fenntartható fejlődés európai szemmel. In: Gömbös E. (szerk.) *Globális kihívások, Millenniumi Fejlesztési Célok és Magyarország*. Magyar ENSZ Társaság, Budapest. 51–60
- Le Blanc, D. (2015): Towards integration at last? The sustainable development goals as a network of targets. *DESA Working paper* No. 141.
- Marlow, D. R., Moglia, M., Cook, S., & Beale, D. J. (2013): Towards sustainable urban water management: A critical reassessment. *Water Research*, 47(20), 7150–7161. <https://doi.org/10.1016/j.watres.2013.07.046>
- Megdal, S. B., Eden, S., & Shamir, E. (2017): Water Governance, Stakeholder Engagement, and Sustainable Water Resources Management. *Water*, 9(3), Article 3. <https://doi.org/10.3390/w9030190>
- Ministry of Interior (2021): Együttműködésben a klímatudatos vízgyűjtő-gazdálkodásért. LIFE-CCA/HU/001604. Information brochure.
- Ministry of Interior (2022): Miért jó víz mellett élni? Vizesélőhelyek ökoszisztéma-szolgáltatásai. LIFE-MICACC LIFE16 CCA/HU/000115. Information brochure.
- Myatt, M., Andrews, E., Vorster, P., Cornwall, C., Mitchell, D. & Santec, M. A. (2019): The Sustainable Water Management Profile: An Assessment Tool to Advance Water Supply Sustainability. Water Foundation.
- Ostrom, E. (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, New York.
- Otto, I. M., Reckien, D., Reyer, C. P. O., Marcus, R., Le Masson, V., Jones, L., Norton, A., & Serdeczny, O. (2017): Social vulnerability to climate change: A review of concepts and evidence. *Regional Environmental Change*, 17(6), 1651–1662. <https://doi.org/10.1007/s10113-017-1105-9>
- Pahl-Wostl, C., Tàbara, D., Bouwen, R., Craps, M., Dewulf, A., Mostert, E., Ridder, D., & Taillieu, T. (2008): The importance of social learning and culture for sustainable water management. *Ecological Economics*, 64(3), 484–495. <https://doi.org/10.1016/j.ecolecon.2007.08.007>

- Pataki, B., Farkas, V. M. & Kerpely, K. (2021): Természetes vízmegtartó megoldások a települési vízgazdálkodásban. A LIFE16 CCA/HU/000115 azonosító számú, „Az önkormányzatok integráló és koordináló szerepének megerősítése az éghajlatváltozáshoz való alkalmazkodás érdekében” című LIFE-MICACC projekt. Budapest.
- Patnaik, A. H. (2021): Gender and participation in community based adaptation: Evidence from the decentralized climate funds project in Senegal. *World Development*, 142, 105448. <https://doi.org/10.1016/j.worlddev.2021.105448>
- Póla P. (2019). A vidékfejlesztés helyi erőforrásrendszere. In: A magyar vidék a XXI. században: Tanulmányok a 70 éves Csátori Bálint köszöntésére. MTA Közgazdasági és Regionális Tudományi Kutatóközpont Regionális Kutatások Intézete, Kecskemét, pp. 264-275.
- Popescu, G. H., Sima, V., Nica, E., & Gheorghe, I. G. (2017). Measuring Sustainable Competitiveness in Contemporary Economies—Insights from European Economy. *Sustainability*, 9(7), Article 7. <https://doi.org/10.3390/su9071230>
- Pronk, J. J. M., Haq, M. (1992): Sustainable development: from concept to action; the Hague report. The Hague : Dutch Ministry of Development Cooperation.
- Reich, G. (2019): Nemzeti Vízstratégia (Kvassay Jenő terv). Nemzeti Köszolgálati Egyetem, Budapest.
- Rivas, S., Urraca, R., Palermo, V., & Bertoldi, P. (2022): Covenant of Mayors 2020: Drivers and barriers for monitoring climate action plans. *Journal of Cleaner Production*, 332, 130029. <https://doi.org/10.1016/j.jclepro.2021.130029>
- Sobhaninia, S., Amirzadeh, M., Lauria, M., & Sharifi, A. (2023): The relationship between place identity and community resilience: Evidence from local communities in Isfahan, Iran. *International Journal of Disaster Risk Reduction*, 90, 103675. <https://doi.org/10.1016/j.ijdrr.2023.103675>
- Somlyódy Péter E. (2020): A vidéki térségek felzárkóztatásának feltételei és eszközei uniós szemszögből – Visszatérés az endogén erőforrásokra alapozott fejlesztési szemlélettől az újraelosztó támogatáspolitikához Magyarországon. *Tér és Társadalom*, 34(4), 18–44. <https://doi.org/10.17649/TET.34.4.3298>
- Számadó, R., Hugyecz, B. (2021): Az öt pilot-projekt társadalmi-gazdasági hatásainak értékelése. A LIFE16 CCA/HU/000115 azonosító számú, „Az önkormányzatok integráló és koordináló szerepének megerősítése az éghajlatváltozáshoz való alkalmazkodás érdekében” című LIFE-MICACC projekt. Belügyminisztérium, Önkormányzati Koordinációs Iroda, Budapest.
- Szép T., Szilávik J., & Carnegie LaBelle M. (2021): A fenntartható fejlődési célok alakulása a feltörekvő Európában: Konvergencia vagy divergencia. *Észak-magyarországi Stratégiai Füzetek*, 18(3), 15–35. <https://doi.org/10.32976/stratfuz.2021.40>
- Szöllősi-Nagy, A. (2018): Víz a XXI. században: Lesz-e elég? *Debreceni Szemle*, 2018/4, pp. 370-380.
- Tóth, R., & Kozma, T. (Szerk.). (2016): A fenntarthatóság és a környezettudatosság fontossága. *Acta Carolus Robertus*. <https://doi.org/10.22004/ag.econ.256518>
- UN. The Millennium Development Goals Report (2010): United Nations: New York, NY, USA, 2010.
- UNESCO (2019): The United Nations World Water Development Report 2019: Leaving No One Behind. Paris, France.
- UNFCCC (2021): Climate Action Pathway – Water. Vision and summary.
- United Nations Partnership Platform (2023): “Municipalities as integrators and coordinators in adaptation to climate change” LIFE16 CCA/HU/000115 (LIFE-MICACC) project. Downloaded: 13 May 2023. Source: <https://sdgs.un.org/partnerships/municipalities-integrators-and-coordinators-adaptation-climate-change-life16>

- Uphoff, N., (1992): Local institutions and participation for sustainable development. Gatekeeper Series No. 3. International Institute for Environment and Development: Sustainable Agriculture and Rural Livelihoods Programme, London.
- Veres, D., Fejes, G., Danyi, G., Halmai, L. & Hegyi, Z. (2021): Vízmegtartó megoldások a hazai vízgazdálkodásban. Megalapozó tanulmány, Budapest.
- Waas, T., Hugé, J., Verbruggen, A., & Wright, T. (2011): Sustainable Development: A Bird's Eye View. Sustainability, 3(10), Article 10. <https://doi.org/10.3390/su3101637>
- WCED (1987): Our Common Future. Oxford University Press: Oxford, UK.
- Weinberger, K., & Jütting, J. P. (2001). Women's Participation in Local Organizations: Conditions and Constraints. World Development, 29(8), 1391–1404. [https://doi.org/10.1016/S0305-750X\(01\)00049-3](https://doi.org/10.1016/S0305-750X(01)00049-3)
- White, T. A., Runge, C. F. (1995): The emergence and evolution of collective action: Lessons from watershed management in Haiti. World Development, 23(10), 1683-1698.

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Slow fashion as a possible route to SDG 12 within the fashion industry

As many may not know, the textile and fashion manufacture combined are the second largest polluting industries. This can mostly be traced back to their complicated supply chain, next to their growth focused business models. Although there have been approaches towards researching the topic, it seems like there is still an undiscovered potential of detecting what slow fashion designates as in regard of production and operation practices. The paper aims to pinpoint the main principles of slow fashion through a thorough literature review, with collecting relevant papers related to slow fashion in the database of SCOPUS. The research also conducts a content analysis from existing descriptions by experts, in order to reveal the possible dissimilarities and parallels in slow fashion and SDG 12 principles. The paper's goal is to see whether slow fashion can act as a supporter of SDG 12's main production aims within the fashion industry.

Key words: slow fashion, SDG 12, circular business models, fast fashion

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Introduction

Though, it is generally accepted that the oil business is the largest polluter currently, what is less commonly recognised is that it is followed by the fashion industry, causing several environmental issues. One of the main reasons that this effect exists is that the industry involves a complicated, long, and diverse supply chain regarding production, textile manufacture, raw material, garment construction, transportation, retail, consumption and finally disposal of the clothes (Gupta, 2022). The before explained chain and business strategy even leads to fast changing trends which encourage early disposal of the clothes causing a vast amount of waste in exchange for a quick profit (Kirchherr, 2017). Unfortunately, these elements strongly contribute to GHG emission, pollution with pesticides, pollution using hazardous dyes while manufacturing, and in addition the endangerment of wildlife as well (Garami, 2023) (Gupta, 2022). Another important aspect of the textile and fashion industry which not many realise is the lack of social responsibility, as the outsourcing of different processes mainly involves the workforce of emerging nations since the cost of labour is significantly lower there. Altogether, the three main aspects of economic, environmental, and social sustainability should be all examined together to evaluate a company's success, but because of the often fragmented and long chains, it is greatly challenging to monitor compliance in every aspect of the operation (Centobelli, 2022).

The severity of the case gets worse year by year, since statistics have shown that people are buying one-third more of the items than 3 or 4 years ago. This effect can be traced back to the increasing availability of large quantities of garments, furthermore, the fact that these items are getting less and less expensive thanks to the economy of scale principle (Fletcher 2014). Next to the mentioned theory, behind the rapid speed of garment creation, there is an economic growth-based business practice as well, which favours standardised, cheap, easy to produce materials with low-cost labour, short lead time and large volume production (Fletcher 2008). Since the mentioned business-as-usual or production-as-usual creates not only environmental but even social harm with its linear model, several actors within the sector and the research community sought to find or

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create an appropriate solution for both the industry and their consumers as well (Abbate, Centobelli, & Cerchione, 2023).

Thanks to the rising awareness – from legislative, furthermore consumer pressure –, several companies have already started to alternate their way of production and operation to both fit the trend and correspond to law making. Of course, this also indicates that researchers in the field of sustainability started to focus on the matter in several ways, such as an economic standpoint of how to change supply chain functions, a biological standpoint of eco-friendly fabrics and an engineering standpoint, how to use new technology and non-hazardous chemicals in production (Gupta, 2022). With this recognition in mind, professionals in the field created several concepts for the solution of unsustainable operation and production practices, just like SDG's responsible consumption and production principles (Nations, 2023). The mentioned conceptions mainly tackle policy-based approaches to handle the encroachment companies create with their linear model-based manufacture.

From the several approaches related to sustainable development and its operation practices, the paper would like to highlight some of the most common ones to present current trends within the topic.

First, the research would like to present the widely known concept of the *Extended producer responsibility* attitude, where the legislation's aim is to encourage suppliers to produce garments in a more sustainable manner, causing durability, recyclability, and proper end-of-life product handling. Another, even greater approach is the *circular economy scheme* which gained great attention in the last five years within the framework of SDGs. The core idea behind circular economy is a process concept that focuses on reuse, reduce, recycle, and recover of a product which – if handled correctly – in theory, can give a solution to environmental issues within production and end-of-life handling (Cooper, 2022). Next to the showcased principles, there is another, quite recent notion, the *Circular Business Model scheme*. The main idea behind CBMs (Circular Business Models) is the innovation of the business-as-usual paradigm to achieve a closed loop in the production processes. As within CE (Circular Economy), CBMs' main driver is to use one material for as long as it is possible and create as much value of it as possible in order to lessen the burden on the environment (Nußholz, 2017). Lastly, there is a need to mention *Sustainable Supply Chain Management* as well, which according to the literature is the management of material, information and capital flow, cooperation with other companies along the supply chain with the focus on all three pillars of sustainable development (Seuring, 2008).

Although these approaches and the wide realisation from both policy makers, researchers and consumers, there is still a gap in solving the complex notion of the social, environmental, and economic values at the same time with the always increasing problem of production and consumption in the fashion industry (Freudenreich, 2020). Moreover, according to Bruna Villa Todeschini, (2017) there is still an uncertainty regarding sustainable fashion business model structures since research about the inner dynamics of successful models are limited because these often turn out to be individual cases. Besides the mentioned deficiency, the policy-based approaches often fail due to the questionable genuinity of the participating companies.

Due to the listed reasons, the importance of finding a well-functioning solution to the fashion and textile industry's unsustainable operation is crucial since it currently does not advocate for transparency, but further generates vast amounts of pollution throughout each element of its supply chain, with reaching the second largest polluter globally. In addition, it includes social cruelty and exploitation and an unsafe working environment due to its preference of outsourcing to cheap labour (Abbate, 2023).

Theoretical background

The following section aims to highlight the theoretical background of the study, introducing the key concepts to deepen the understanding of the subject.

The characteristics of Fast fashion

The fashion industry today can be characterised as a fast-paced, always changing environment which have been established by the rapid turnover of fashion trends and the producer's effort in creating more seasons within clothing lines with low quality fabric, poor garment construction and a short lifespan in hope of an always growing profit (Szilágyi-Csüllög, 2021) (Fletcher, 2008). As a result of the above, even two decades ago the term fast has been connected to fashion to present those large-scale practices, which are logistics centred and economic growth focused. As an interesting aspect of the topic, many authors create a parallel between the fast food and fast fashion concept, since both stand for standardised mass production. In other words, fast fashion somewhat imitates the fast-food industry, where products are designed to be cheap, easily, and rapidly producible with low-cost materials and labour. In addition, another key element is the short lead time and efficient mass production to maximise the concept of the economies of scale, while also outsourcing practices for cheap labour around the world (Fletcher, 2008; Freudenreich, 2020). Thus, when we talk about 'fast' in this context, it means an economic tool to increase profit and garment throughput. Fast fashion therefore is not only shaped by the need of production speed, but a series of business practices which focuses on an ongoing economic growth. Altogether, fast fashion can be described as a set of business practices and production strategy which aims to maintain an ongoing growth of profit through standardised and outsourced mass-production with cheap materials, weak or fragile construction of the garments and cheap labour, following/creating monthly changes in trends (Fletcher, 2008; Vesterinen 2022).

As we can see, there are many flaws regarding fast fashion and its operation/production values considering it has unsustainable and often unethical consequences. Fortunately, stakeholders within, and outside the industry started to realise the unfeasible effects caused by the notion and started to act towards finding achievable and practical solutions to the matter.

A short overview of the United Nations' responsible production and consumption – SDG 12

As sustainable growth is the key factor of the UNs' Sustainable Development Goals, responsible production, and consumption as one of the principles also aims to reach this core value. The centre of this aspect is to promote such patterns which can result in a transition towards a greener and socially inclusive global economy. Based on the widely spread circular economic models, UN created a set of indicators which establishes the goals and leading direction towards the sustainability transition. These goals amongst others, include a number of countries shifting towards a sustainable consumption and production pattern with the help of policy instruments, in parallel with sustainable management and efficient natural resource usage, the halving of food waste loss per capita in production and supply chain processes, harmful chemical and waste reduction, the 3R principle (reuse, reduce, recycle), the transition to sustainable operation within large firms, public procurement practice promotion and the adequate information and awareness building of sustainable development (Nations, 2023; Nations, 2023).

Sustainable fashion as a concept

The concept of sustainable fashion closely follows the theories of Circular Economy, SDGs, and the Triple Bottom Line frame as a base of its operation. The main component of sustainable fashion is almost fully based on the "reuse, reduce, and recycle" buzzwords, with the addition of Sustainable Developments' social dimension element. This mixture of ideas gives the overall definition of sustainable fashion that include a sustainable supply chain, sustainable fashion product which is made in an environmental and social friendly manner (considers causes like human rights and environmental protection), recycled, or reused raw material production, manufacturing, and use of biological textiles, or recycled material from scraps, bottles, or old

clothes. A key element of sustainable fashion incorporates marketing and branding, which even has an educator role towards consumers (Shen, 2014).

Although the philosophy of sustainable fashion seems to include every dimension of environmental and social prosperity, the application into practice seems to be a challenge to most of the companies. Since the seriousness of pollution and social injustice is excruciating and still ongoing, many stakeholders in the industry expect the rapid change from the linear, business-as-usual operation to a sustainable model. Unfortunately, in order to reduce the pressure, some brands choose to resort to tools like greenwashing to appear as they are meeting the criteria mentioned above. Overall, the importance of sustainability practices is without a doubt valid and relevant, economic and consumer benefits still serve as the leading motive where many use the matter as an apparatus for increased material and continuous economic growth (Adamkiewicz, 2022, Fletcher, 2008).

Sustainable, circular business models and supply chains in the fashion industry

As in the linear model, circular business models serve as value proposition, value creation and value capture framework within the given business. Circular business models therefore serves as a management-based tool where circular economy concepts are integrated as guidelines for the design and development with the 3R concept of reduce, reuse, recycle or recover (Henry, 2020). According to Marvin Henry (2020) it is necessary to set a difference between sustainable business models and circular business models, since the first term refers to a concept which is centred around creating an economic, environmental and social value at the end of the process without specifying the tools, directions, while CBM is a narrowed down approach which serves as a route in addressing the negative effects of business operation leading to environmentally harmful practices. With this being said, ultimately SBMs can also lead to damaging effects, if the design options are only partially following environmentally friendly production (Henry, 2020).

Moreover, it is also essential to highlight the fact that while SBMs hold a social relevance and work enrichment as a basis for establishing value – next to economic and environmental dimension –, in case of CBMs it is only a secondary aspect of its core value formation (P.P. Pieroni, 2019). Besides the above explained, according to Marina P.P. Pieroni (2019) while the two terminologies have been used broadly, there is no such thing as an absolute SBM or CBM, since only practices and principles that enable a fit with the vision of circular economy can be applied to business models.

After understanding the principles of SBM and CBM, there is a need to shortly overview the meaning of sustainable supply chain management within the fashion industry. As an observation, it is worthwhile to accent the fact that CBM features somewhat overlap SSCM (sustainable supply chain management) tools since it can be seen as CBM's subordinate element. There are several approaches in pursuing an environmentally viable supply chain operation within the garment industry where the literature emphasises some of the main methods according to the following: the use of organic fabric, the reuse and recycle of materials, vintage practices, second-hand, clean technologies, green certification, green product, and process design. Here, the traceability of the product is also an important factor to create a transparent production chain (Caniato, 2012). With the help of the short overview of concepts, the paper would like to present some ideas on how exactly circular business models and supply chains can look like in practice. One widely known practice is the product take-back system which focuses on the capitalization of remaining items, which then can serve as raw material for manufacturing. Another popular approach is second-hand resale which obtains its final product from already existing and used items; with this concept, the business skips the manufacturing element and does not generate more waste by adding an additional garments to the already filled market (Abbate, Centobelli, & Cerchione, 2023; Caniato, 2012). As we can see, there are many options within the reduce, reuse, recycle or recover principle of CBMs and SSCM even within the fashion industry, although as mentioned before, it does not

completely integrate every sustainability aspect, leaving the social dimension as a secondary target. One could say that with applying SBM principles, this deficiency could be settled. However, as Marina P.P. Pieroni (2019) explained, the model only stands for business concepts without specifying any tools, directions, and processes. With this, one can discover that SBM and CBM concepts lack true complex solutions for a more sustainable production and operation practice in accordance with the UN SDG 12 principle.

The emergence of Slow Fashion

The concept of Slow Fashion originates from the Slow Food movement which originally started in Italy as a counter reaction to the emerging fast-food expansion (Fletcher, 2008; Legere, 2020). The philosophy's founder was Carlo Petrini in 1986 who claimed that fast food chains as McDonalds cause a threat to culture and local community (Jung, 2014). The core idea behind the movement is to combine the pleasure of eating with a commitment to both the community and the environment at the same time. As in the slow food movement, slow fashion advocates a backdrop of growth-based activities with the aim of reconnecting people to their communities, local values and traditional production with awareness and responsible production and consumption. The principles of the movement also reject the economic priorities of economy of scale or mass production (Fletcher, 2008).

Research objective

Despite many efforts, the fast fashion paradigm still dominates the industry with its supply chains creating mass-produced, ready-to-wear collections on a bi-weekly rate. With maintaining such high production – and consumption – volumes, the issue of sustainability remains unsolved. With the “trend setting” high-production mindset comes the large volume, short life disposal of the garments creating a vast number of landfills and pollution. Next to the contamination, the fastened production system causes a social issue as well, where powerful companies tend to use low-cost labour from around the world in sweatshops where working conditions are often neglected (Legere, 2020). In order to address these complex social and environmental issues, several production-based innovations have arisen but unfortunately, these have not been able to fully tackle all dimensions of the problem area. As an alternative to the existing methods, another practice emerged originally from the so-called slow food movement, to counteract the mass-production based operation. This new philosophy is called slow fashion, which promotes a comprehensive take on socially and environmentally sustainable operation within the industry (Pookulangara, 2013). Since the principles and term slow fashion only emerged approximately a decade and a half ago, researchers in the field tends to refer to it as a new concept, furthermore state that many time the presented definition is contradictory or even undeveloped (Pookulangara, 2013, West, 2021, Legere, 2020, Vesterinen, 2022).

Therefore, there is an obvious need to first clarify slow fashion's main dimension to set clear boundaries, discover limitations, opportunities, and categories. With the discovered attributes, the paper attempts to discover how the idea can serve as a supporting mechanism towards SDG 12's principles, moreover, to see if slow fashion could support the realisation of SDG 12 practices in the fashion industry.

Methodology and research question

The methodology of the research consisted of SCOPUS article search where the used key word was “slow fashion” to find possibly relevant articles which discuss the topic in a broader manner. Afterwards, I limited the search results with filtering only business, economic and management articles in English to further restrict the findings. Subsequently, this search eventuated in 155

articles which later were sorted based on their abstracts' content. With analysing the abstracts, 4 categories were made in order to further look into the articles' contents. The four main categories were: matches the topic, moderately matches the topic, somewhat matches the topic, and did not match the topic at all. After classifying the papers, I started to investigate their content in more detail, again selecting those which enclosed the relevant definitions and principles related to slow fashion which were open-access and available to read. With the second round of sorting altogether, 33 research papers were found which discussed the relevant information in connection to slow fashion on some level.

After the collection, the paper carries out the content analysis of the gathered 33 articles to identify the most used principles within slow fashion. The research further reveals the dissimilarities and parallels between SDG 12 and slow fashion, to see if slow fashion could serve as a supporting mechanism of SDG 12. It is also necessary to underline the modesty of the sample size, as larger samples can lead to a different conclusion.

Subsequently, the research questions are defined as the following:

1. *Based on the collected articles, how can we categories slow fashion's main principles?*
2. *What similarities and differences can be found regarding slow fashion and SDG 12?*
3. *Could slow fashion serve as a good supporting mechanism for SDG 12 within the fashion industry?*

Findings and results

In the following section, the findings of the research are presented where the paper alludes to a content analysis of the collected research.

Content analysis

In order to get a better understanding of the ideas about the principles and its most used dimensions, the paper explores the most commonly cited source when talking about slow fashion in the collected articles. Based on the results, Kate Fletcher is the most referred author when talking about slow fashion concepts. When looking into Fletcher's (2008) work we can differentiate about 14 dimensions which seems to tackle slow fashion as a whole. To reveal the dimensions together with the other author's definitions, a matrix has been created, to serve as a transparent and easily understandable data source.

Before the analysis of the assembled data, the paper first presents the base definition of Fletcher to deliver a better insight to the later presented.

As Fletcher claims, the word "slow" in slow fashion is not referring to the speed, rather it conceptualises a different worldview which promotes a variety of sustainable fashion production and consumption within the limits of our environment. Although the before mentioned - as in everything -, time has a part in the slower approach as well but not how many would interpret it as first. Fletcher here means a possible longer term relationship development that recognises the value of traditional manufacturing aspects (Fletcher, 2008).

Moreover, the author highlights the importance of diversity and authenticity next to quality which creates the idea of a seasonless, all year-round garment further endorsing the quality over quantity viewpoint (Fletcher, 2008). The writer further touches upon the economic side of the concept where the following aspects have been displayed:

".... slow fashion is not business as usual but just involving design classics. Nor is it production as usual but with long lead times...it is about appropriate speed for people, workers, and context. The slow culture vocabulary of small-scale production, traditional craft techniques, local materials and markets...It supports a changed set of power relations between fashion creators and wearers...It is a heightened state of awareness of the design process and its impacts on resource flows, workers, communities and ecosystems, with higher prices of garments to reflect true

ecological and social costs...as a production model it offers a radical alternative to high-volume, standardised fashion, making profit by selling fewer higher-priced items....it is also seen to promote the democratisation of fashion, not by offering more people access to clothes by lowering prices but by offering these people more control over institutions and technologies that affect their lives.” - Kate Fletcher (2008)

After discovering how the authors perceive the term, we can have an idea what of slow fashion stands for in a more general manner. With the findings taken into consideration, we can now attempt on defining slow fashion as a global term:

Overall slow fashion stands for a holistic philosophy which handles all three dimensions – environmental, economic, and social – together in order to propose potential practical solutions to consumer societies' undesirable production and consumption practices.

Now that we have gained an understanding of the term itself, the paper would like to present the result of the table of most referred dimensions and ideas in the accumulated literature. In order to see the detailed table, please refer to the appendix.

1. Table of collected dimensions of slow fashion according to Fletcher (2008) next to the most cited principals in the selected article

| Dimensions of the most cited definition (Fletcher, 2008) | Total collected SCOPUS papers used dimensions |
|--|---|
| diversity/authenticity | 17 |
| product quality | 29 |
| long lead time | 2 |
| small-scale production | 12 |
| traditional craft techniques | 10 |
| local materials and production | 18 |
| local market | 15 |
| sustainably aware design process and production | 28 |
| ethical labour | 25 |
| sustainable resource flow | 12 |
| community centred | 16 |
| high product cost | 6 |
| environmental and ecosystem awareness | 31 |
| philosophical view/approach | 9 |

Source: Own work

While taking a close look at the table, one could realise that next to the four highlighted dimensions of *product quality*, *sustainably aware design process and production*, *ethical labour*, and *environmental and ecosystem awareness* the other principals seriously lack behind. The cause behind the phenomenon can be explained by two main observations which arose throughout the literature exploration. Primarily, much of the literature tends to use only a fraction of the base definition, even though most of the writers have used one of Fletcher's' interpretations throughout their work. Since authors mainly choose to only include those aspects or dimensions of slow fashion which they elucidated as important, a misalignment can be seen in the used definitions with missing elements of the core concept (Vesterinen, 2022). With this we could see that most authors focus on 4 main dimensions out of the 14, which gives us a good indication about how writers tend to use the term and view the other dimensions as somewhat of an additional element to the highlighted principles.

Although the table presents how authors interpreted the concept, it is vital to highlight that as an emerging subtype of the Slow (Food) movement, slow fashion as a philosophy intends to cover economic, environmental, and social levels as a whole with a fresh approach against linear economic growth, production and consumerism of today's world. Its main goal is a change in the current paradigm which not only requires business model and supply chain management changes

but sociological ones as well. Without highlighting the above, the definition can lose its core concept, becoming only a buzzword for sustainable practices.

Since slow fashion includes such a vast topic, there is not much room to find any environmental, social, or economic aspect which it does not cover. Although, it seems like one of the authors still managed to complement the concept with an additional insight. The mentioned researcher brought up the topic of cruelty-free production which has been an age-old topic within animal rights and social, ethical questions (Sinha, 2022). Since other socio-ethical questions beside workers' rights and fair-trade have not yet been discussed in the examined papers, it is fair to raise the question whether the framework should involve animal related ethical issues as well, since at some level it does affect the biodiversity and environment as well.

Possible correlations and differences of slow fashion and SDG 12

Based on the above stated and the differentiated dimensions of slow fashion, The paper can compare, then discover the possible parallels between slow fashion and SDG 12 principles. The conducted comparison can be seen in the following table.

2. Table The possible supporting dimensions of slow fashion regarding SDG 12 principle

| Dimensions of the most cited definition (Fletcher, 2008) | SDG 12 principles (Nations, 2023) | 12.1 | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 12.7 | 12.8 | 12A | 12B | 12C |
|--|-----------------------------------|------|------|------|------|------|------|------|------|-----|-----|-----|
| diversity/authenticity | | | | | | | | | | | | |
| product quality | | x | x | | x | x | | x | | | | |
| long lead time | | | | | | | | x | | | | |
| small-scale production | | | x | | | | | | | | | |
| traditional craft techniques | | | | | | x | | | | | | |
| local materials and production | | | x | | x | x | | x | | | | |
| local market | | | | | | | | x | x | | | |
| sustainably aware design process and production | | | | | | | | | | | | |
| ethical labour | | | x | | x | x | | | | | | |
| sustainable resource flow | | | | | | | x | | | | | |
| community centred | | | | | | | | | x | | | |
| high product cost | | | | | | | | | | | | |
| environmental and ecosystem awareness | | | | | x | x | | | | | | |
| philosophical view/approach | | x | | | | | | | | | | |

Source: Own work

Here, SDG 12's main dimensions were considered based on the United Nations' (2023) created goals within the subcategory. When comparing the two principals and ideas, there are an obvious connection with slow fashions' dimensions and SDG 12's principles. Although the research found that not every aspect aligns within the two ideas. As for first, the paper would like to present the identical elements of the mentioned schemes, where it is found that slow fashion integrates 7 main concept of SDG 12's elements. The homogeneous principals based on the collected dimension

include but does not limit to the following: sustainable management and efficient natural resource practices, alternative and sustainable material usage - such as nano-cellulose from food-waste -, the use of 3R principle, a transparent and clear supply chain mechanism, and an aim towards educating the consumers. It further includes the strong philosophy or concepts of localisation both on the production and consumption level (Fletcher, 2008, Nations, 2023).

Altogether, as we can see, slow fashion ideas follow mostly the main philosophy of SDG 12 with alternative solutions of a non-linear business and supply chain model.

It is also vital to see the possible dissimilarities between the two concepts, which gives us a better understanding on the connection between slow fashion and SDG 12. The most prominent difference is the idea of the now used linear model's growth focused operation where slow fashion, unlike SDG 12, rejects the linear trend and its operation methods. Since SDG 12 does not fully rule out the idea of linear growth, the concepts deviate from each other over this notion. In this regard, it can be implicated that the slow fashion movement mostly supports many elements from UN's SDG 12 - Responsible Production and Consumption, but in one main proposition – linear growth-based models – slow fashion offers a somewhat more extreme solution with an innovative and holistic take on business model and production practices (Chhabra, 2022). Of course, this can cause a debate whether this major difference of economic understanding could limit the successful integration of slow fashion production and business practices, nevertheless it is indisputable that the main principles of slow fashion do support some of SDG 12's main propositions.

Overall, it can be concluded that based on the United Nations' (2023) sources, the principle of slow fashion integrates almost all sets of indicators when talking about production, with an additional concept of a "slower" economic mechanism.

Conclusion

The imminent problem of unsustainable practices in fashion has reached its limit with unethical and unsafe work patterns, environmentally harmful attitudes, and the ignition of society with fast-paced bi-weekly consumption promotion.

Many in the field of policy and academics realise the seriousness of the problem of unsustainable practices, where then general approach was made with the creation of Sustainable Development Goals where one principle specifically aims at the question of responsible and sustainable production and consumption (SDG 12). From then on, experts in the field started to apply general sustainability concepts to specific industries to find direct and practical solutions to harmful activities. The same happened to the fashion industry as well, since fast fashion took over with a mindset controlled by economic growth and an always expanding profit as goal. At first, sustainable fashion appeared with the idea of sustainable business models where sustainable developments' all three pillars were included as base principles of the notion. To further transfer this ideation into practice, experts brought in the approach of circular business models. With the development of CBMs, even more awareness seemed to emerge. Even though the progress, the practical implementation of the initiation lacked one of the three pillars which were the societal aspect. The model only concerned the societal and ethical issues as secondary, whereas the three pillars need to be handled equally. For the following reason – furthermore to contrast the fast fashion model –, a new philosophy emerged from the Slow Food movement, slow fashion itself. Similarly, to its predecessors, slow fashion aims to be more than a simple idea, it denotes a new philosophy within society, an overall radical change within production and consumption, where in extension, circular economy, SDG 12, and sustainable fashion concepts meet at the same time. With looking deeper into the manner, the paper discovered that there is a need to discover slow fashions main dimensions in order to see if it truly supports SDG 12 principles. Without the set dimensions and a proper definition, the philosophy can be misrepresented if given author adopts it incorrectly. Therefore, without a doubt there is a need for an overview of existing descriptions to tackle the main pinpoints of the philosophy itself. To fill this gap, the research explored one of

the biggest databases, SCOPUS to find current literature on the matter. With the detected and selected articles, a content analysis was conducted to determine the main used dimensions of slow fashion. The findings of the analysis brought up some interesting observations with the possibilities of further broadening the concept. With the result of the analysis the paper found 14 main dimensions of slow fashion, which fully covered all aspects of the philosophy. The findings further showed that from the detected 14 dimensions, authors often used only 4 of them when talking about the term, which can be thanked to the different interpretations of the writers. This can give us the idea that the authors might use the concept's general ideas as explanatory aspects and apply the other dimensions as practical features or sub-categories.

When looking at the possible similarities and dissimilarities of the two ideas, the research first had to understand the basis of SDG 12 and slow fashion at the same time. Here the collected dimensions of slow fashion and the set goals of SDG 12 were analysed, to see if there are any parallels between the two concepts. Based on this method, the study first focused on the possible similarities between SDG 12 and slow fashion, where it was found that slow fashion includes 7 main ideas of SDG 12 regarding production practices. As for the dissimilarities, there were one main ideation which majorly differs between the two concepts, this was the economic approach of the two concepts. While slow fashion rejects the current growth-based linear operation, SDG 12 does not fully distance itself from the growth-centred operation idea, by this causing a contradiction between their basic "philosophical" elements. This of course can result in a debate if we are talking about possible solution approach benchmarking between the two concepts, however it can be concluded that slow fashion's practical solutions mostly fit into SDG 12's notions with an additional belief of a "slower" economic mechanism.

References

- Abbate, S., Centobelli, P., & Cerchione, R. (2023). From Fast to Slow: An Exploratory Analysis of Circular Business Models in the Italian Apparel Industry. *International Journal of Production Economics*, Volume 260, 108824. <https://doi.org/10.1016/j.ijpe.2023.108840>
- Alisha Legere, J. K. (2020). The role of self-concept in shaping sustainable consumption: A model of slow fashion. *Journal of Cleaner Production*, Volume 39, Issue 2, Pages 188-207.
- Aprianingsih, A. F. (2022). Slow fashion purchase intention drivers: an Indonesian study. *Journal of Fashion Marketing and Management*, Pages 1-16, DOI: 10.1108/JFMM-07-2021-0176.
- Barnes, L. L.-G.-N. (2013). An exploratory study of the decision processes of fast versus slow fashion consumers. *Journal of Fashion Marketing and Management: An International Journal*, Volume 17, Issue 2, Pages 141-159, <https://doi.org/10.1108/JFMM-02-2011-0045>.
- BERNARDES, J. M. (2018). A new and sustainable service to slow fashion brands. *Industria Textila*, Volume 69, Issue 2., Pages 152-157, DOI:10.35530/IT.069.02.1528.
- Birte Freudenreich, S. S. (2020). Developing sufficiency-oriented offerings for clothing users: Business. *Journal of Cleaner Production*, Volume 247, Article number 119589. DOI: <https://doi.org/10.1016/j.jclepro.2019.119589>
- Bruna Villa Todeschini, M. N.-d.-M. (2017). Innovative and sustainable business models in the fashion industry: Entrepreneurial drivers, opportunities, and challenges. *Business Horizons*, Volume 60, Issue 6, Pages 759-770. <https://doi.org/10.1016/j.bushor.2017.07.003>
- Busalim, A. F. (2022). Consumer behavior in sustainable fashion: A systematic literature review and future research agenda. *International Journal of Consumer Studies*, Volume 46, Issue 5, Pages 1804-1828, <https://doi.org/10.1111/ijcs.12794>.
- Chakraborty, S. S. (2023). Can a connection with the indigenous cultural values encourage sustainable apparel consumption? *Journal of Fashion Marketing and Management*, Volume 27, Issue 1, Pages 80-99, <https://doi.org/10.1108/JFMM-07-2021-0191>.

- Chhabra, S. S. (2022). Factors Affecting the Adoption of Slow Fashion – An Exploratory Study of Multiple Stakeholders. *Journal of Macromarketing*, Volume 42, Issue 4, Pages 492-509, <https://doi.org/10.1177/02761467221116294>.
- Essi Vesterinen, H. S. (2022). Sustainable anti-consumption of clothing: A systematic literature review. *Cleaner and Responsible Consumption*, Volume 5, Article number 100061. DOI: <https://doi.org/10.1016/j.clrc.2022.100061>
- Federico Caniato, M. C. (2012). Environmental sustainability in fashion supply chains: An exploratory case based research. *International Journal of Production Economics*, Volume 135, Issue 2, Pages 659-670. <https://doi.org/10.1016/j.ijpe.2011.06.001>
- Fletcher, K. (2008). Conclusions. In K. Fletcher, *Sustainable fashion and textiles; Design Journeys; Second Edition* (old.: 240 - 241). London: Earthscan. <https://doi.org/10.4324/9781849772778>
- Fletcher, K. (2008). Speed. In K. Fletcher, *Sustainable Fashion and Textiles; Design Journeys; Second Edition* (old.: 189-220). London: Earthscan. <https://doi.org/10.4324/9781849772778>
- Fletcher, K. (2014). Sustainable fashion and textiles; Design Journeys. In K. Fletcher, *Sustainable fashion and textiles; Design Journeys*. London: Routledge.
- Garami Mária, R. Z. (2023). Certain aspects of decent and sustainable work, with a special focus on the economic and. *Észak-magyarországi Stratégiai Füzetek*, XX. évfolyam, page 121, <https://doi.org/10.32976/stratfuz.2023.10>.
- Gupta, S. G. (2019). The Role of Style Versus Fashion Orientation on Sustainable Apparel Consumption. *Journal of Macromarketing*, Volume 39, Issue 2, Pages 188-207, <https://doi.org/10.1177/0276146719835283>.
- Jodie West, C. S. (2021). A bottom up approach to slowing fashion: Tailored solutions for consumers. *Journal of Cleaner Production*, Volume 296, Article number 126387. <https://doi.org/10.1016/j.jclepro.2021.126387>
- Julia Adamkiewicz, E. K. (2022). Greenwashing and sustainable fashion industry. *Current Opinion in Green and Sustainable Chemistry*, Volume 38, 100710. <https://doi.org/10.1016/j.cogsc.2022.100710>
- Julian Kirchherr, D. R. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, Volume 127, Pages 221-232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Keith, S. S. (2015). New life luxury: upcycled Scottish heritage textiles. *International Journal of Retail and Distribution Management*, Volume 43, Issue 10-11, Pages 1051-1064, <https://doi.org/10.1108/IJRDM-07-2014-0095>.
- Lira, J. C. (2022). Theory of planned behavior, ethics and intention of conscious consumption in Slow Fashion Consumption. *Journal of Fashion Marketing and Management*, Volume 26, Issue 5 Pages 905-925, <https://doi.org/10.1108/JFMM-03-2021-0071>.
- Magnuson, B. R. (2017). Re-visiting an old topic with a new approach: the case of ethical clothing. *Journal of Fashion Marketing and Management*, Volume 21, Issue 3, Pages 400-418, <https://doi.org/10.1108/JFMM-10-2016-0091>.
- Marina P.P. Pieroni, T. C. (2019). Business model innovation for circular economy and sustainability: A review of approaches. *Journal of Cleaner Production*, 198-216. <https://doi.org/10.1016/j.jclepro.2019.01.036>
- Marvin Henry, T. B. (2020). A typology of circular start-ups: An Analysis of 128 circular business models. *Journal of Cleaner Production*, Volume 245, 118528. <https://doi.org/10.1016/j.jclepro.2019.118528>
- McNeill, L. S. (2019). Slow fashion – Balancing the conscious retail model within the fashion marketplace. *Australasian Marketing Journal*, Volume 27, Issue 4, Pages 215-223, <https://doi.org/10.1016/j.ausmj.2019.07.005>.

- Musova, Z. M. (2021). Consumer attitudes towards new circular models in the fashion industry. *Journal of Competitiveness*, Volume 13, Issue 3, Pages 111-128, <https://doi.org/10.7441/joc.2021.03.07>.
- Nations, U. (2023). *Ensure sustainable consumption and production patterns*. Forrás: TARGETS AND INDICATORS: <https://sdgs.un.org/goals/goal12>
- Nations, U. (2023). *GOAL 12: Sustainable consumption and production*. Forrás: United Nations environment programme: <https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-12>
- Nußholz, J. L. (2017). Circular Business Models: Defining a Concept and Framing an Emerging Research Field. *Environmental Sustainability and Applications*. <https://doi.org/10.3390/su9101810>
- Overdiek, A. (2018). Opportunities for slow fashion retail in temporary stores. *Journal of Fashion Marketing and Management*, Volume 22, Issue 1, Pages 67-81, <https://doi.org/10.1108/JFMM-05-2017-0042>.
- Ozdamar Ertekin, Z. A. (2015). Sustainable Markets: Motivating Factors, Barriers, and Remedies for Mobilization of Slow Fashion. *Journal of Macromarketing*, Volume 35, Issue 1, Pages 53-69. <https://doi.org/10.1177/027614671453593>
- Piera Centobelli, S. A.-R. (2022). Slowing the fast fashion industry: An all round perspective. *Current Opinion in Green and Sustainable Chemistry*, Vol. 38. <https://doi.org/10.1016/j.cogsc.2022.100684>
- Prado, N. d. (2022). Sustainability in fashion retail: literature review and bibliometric analysis. *Gestao e Producao*, Volume 29, Article number e13322, <https://doi.org/10.1590/1806-9649-2022v29e13322>.
- Prothero, A. M. (2015). Introduction to the Special Issue: Sustainability as Megatrend II. *Journal of Macromarketing*, Volume 35, Issue 1, Pages 7-10, <https://doi.org/10.1177/0276146714556818>.
- Ramonienė, L. (2023). Sustainability motives, values and communication of slow fashion business owners. *Journal of Philanthropy and Marketing*, <https://doi.org/10.1002/nvsm.1788>.
- Reimers, V. M. (2016). The academic conceptualisation of ethical clothing: Could it account for the attitude behaviour gap? *Journal of Fashion Marketing and Management*, Volume 20, Issue 4, Pages 383-399, <https://doi.org/10.1108/JFMM-12-2015-0097>.
- Richa Gupta, A. K. (2022). Chapter 10 - Waste management in fashion and textile industry: Recent advances and trends, life-cycle assessment, and circular economy. In *Emerging Trends to Approaching Yero Waste; Environmental and Social Perspectives* (old.: 215-242). Elsevier Inc. <https://doi.org/10.1016/B978-0-323-85403-0.00004-9>
- Sakhhi Chhabra, S. S. (2022). Factors Affecting the Adoption of Slow Fashion – An Exploratory Study of Multiple Stakeholders. *Journal of Macromarketing*, Vol. 42(4) 492-509. <https://doi.org/10.1177/02761467221116294>
- Sanjukta Pookulangara, A. S. (2013). Slow fashion movement: Understanding consumer perceptions - An exploratory study. *Journal of Retailing and Consumer Services*, Volume 20, Issue 2, Pages 200-206. <https://doi.org/10.1016/j.jretconser.2012.12.002>
- Sellitto, M. V. (2022). Comparing Competitive Priorities of Slow Fashion and Fast Fashion Operations of Large Retailers in an Emerging Economy. *Global Journal of Flexible Systems Management*, Volume 23, Issue 1, <https://doi.org/10.1007/s40171-021-00284-8>.
- Şener, T. B. (2019). Sustainable dressing: Consumers' value perceptions towards slow fashion. *Business Strategy and the Environment*, Volume 28, Issue 8, Pages 1548-155, <https://doi.org/10.1002/bse.2330>.
- Shen, B. (2014). Sustainable Fashion Supply Chain: Lessons from H&M. *Sustainability in Fashion Business Operations*, 6236-6249. <https://doi.org/10.3390/su6096236>

- Shih, W. A. (2017). Competitiveness in a Slow Relational Production Network: The Case of London's Savile Row Tailors. *Clothing and Textiles Research Journal*, Volume 35, Issue 3, Pages 143-155, <https://doi.org/10.1177/0887302X17690023>.
- Sinha, P. S. (2022). A systematic review and future research agenda for sustainable fashion in the apparel industry. *Benchmarking: An International Journal*, 1463-5771. <https://doi.org/10.1108/BIJ-02-2022-0142>
- Sobreira, É. S. (2020). Do empowerment and materialism influence slow fashion consumption? Evidence from Brazil. *Journal of Fashion Marketing and Management*, Volume 24, Issue 3, Pages 415-435, <https://doi.org/10.1108/JFMM-08-2019-0176>.
- Sojin Jung, B. J. (2014). A theoretical investigation of slow fashion: sustainable future of the apparel industry. *International Journal of Consumer Studies*, 510 - 519.
- Sung, J. W. (2019). Investigating male consumers' lifestyle of health and sustainability (LOHAS) and perception toward slow fashion. *Journal of Retailing and Consumer Services*, Volume 49, Pages 120-128.
- Stefan Seuring, M. M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 1699-1710. <https://doi.org/10.1016/j.jclepro.2008.04.020>
- Szilágyi-Csüllög Mónika, D. A. (2021). "Fashion is an imprint of an era" - Consumer acceptance of sustainable fashion after the. *Észak-magyarországi Stratégiai Füzetek*, XVIII. évfolyam, 3, Page 37, <https://doi.org/10.32976/stratfuz.2021.41>.
- Tim Cooper, S. C. (2022). Garment failure causes and solutions: Slowing the cycles for circular fashion. *Journal of Cleaner Production*, Volume 351. <https://doi.org/10.1016/j.jclepro.2022.131394>
- Todeschini, B. C.-d.-M. (2017). Innovative and sustainable business models in the fashion industry: Entrepreneurial drivers, opportunities, and challenges. *Business Horizons*, Volume 60, Issue 6, Pages 759-770. <https://doi.org/10.1016/j.bushor.2017.07.003>
- Trejo, H. S. (2019). Made in New York: A Collaborative Model to Encourage Slow Fashion. *Clothing and Textiles Research Journal*, Volume 37, Issue 3, Pages 139-154, <https://doi.org/10.1177/0887302X19838331>.
- Xue, X. C. (2022). Consumption of traditional handicraft fashion: Motivations, intentions and behaviours of Chinese consumers. *Cleaner and Responsible Consumption*, Volume 4, Article number 100046, <https://doi.org/10.1016/j.clrc.2021.100046>.

Appendix

| Dimensions of the (Fletcher, 2008) | | | | | | | | | | | | | | |
|------------------------------------|-------------------------|-----------------|----------------|------------------------|------------------------------|--------------------------------|--------------|---|----------------|---------------------------|-------------------|-------------------|---------------------------------------|------------------------------|
| SCOPUS papers dimensions | diversity/ authenticity | product quality | long lead time | small-scale production | traditional craft techniques | local materials and production | local market | sustainably aware design process and production | ethical labour | sustainable resource flow | community centred | high product cost | environmental and ecosystem awareness | philosophical view/ approach |
| (Todeschini, 2017) | X | X | | | | X | X | X | X | | X | | X | |
| (Pookulangara, 2013) | | | | | | | | X | X | X | X | | X | X |
| (Ozdamar Ertekin, 2015) | X | X | | X | | | | X | | X | | | X | X |
| (Sojin Jung, 2014) | X | X | | X | | X | X | X | X | X | | | X | |
| (Barnes, 2013) | X | X | | | | | | X | | X | | | X | |
| (Birte Freudenreich, 2020) | | X | | | | | | X | | | | | X | |
| (Alisha Legere, 2020) | X | X | | | | X | X | X | X | | X | | X | X |
| (Gupta, 2019) | X | X | | | | | | X | | X | | | X | |
| (Reimers, 2016) | | X | X | | | | | X | X | | | | X | |
| (Sung, 2019) | | X | | | | X | X | X | X | | X | | X | |
| (Musova, 2021) | | X | | | | | X | X | X | | | | X | |
| (Magnuson, 2017) | | X | | | X | | | X | | | | | X | |
| (Şener, 2019) | | X | | X | X | X | X | X | X | X | X | X | X | |
| (Keith, 2015) | | X | | X | X | X | X | X | X | | X | | X | |
| (McNeill, 2019) | | X | | | | | | X | | | | | X | X |
| (Overdiek, 2018) | X | | | X | | X | | | X | | | | X | X |
| (Prothero, 2015) | | X | | | | | | X | X | | X | | X | |
| (Trejo, 2019) | X | X | | | | X | X | X | X | | | | X | X |
| (Sobreira, 2020) | X | X | | X | | X | X | X | X | | X | | X | X |
| (Jodie West, 2021) | X | X | | | | | | X | X | | X | X | X | |
| (Busalim, 2022) | | X | | | | | | X | X | | X | | X | |
| (Lira, 2022) | X | X | | X | X | X | X | X | X | X | X | X | X | X |
| (Bernardes, 2018) | | | | | | | | X | | X | X | | X | |
| (Sellitto, 2022) | | X | X | X | | | | | | | | X | | |

| | | | | | | | | | | | | | | |
|----------------------|----|-----------|---|----|---------------|----|----|-----------|-----------|----|----|---|-----------|---|
| (Essi, 2022) | X | X | | X | X | X | X | X | X | | X | | X | |
| (Shih, 2017) | X | X | | | X | X | | X | X | | | | X | |
| (Xue, 2022) | | X | | | X | X | | | X | | X | X | X | |
| (Chakraborty, 2023) | X | | | | X | X | X | | X | | | | X | |
| (Sinha, 2022) | | X | | | | | | X | X | X | | | X | |
| (Chhabra, 2022) | X | X | | | X | X | X | X | X | | X | | X | X |
| (Prado, 2022) | X | X | | X | | X | | X | X | X | X | | | |
| (Ramonienė, 2023) | | X | | X | X | X | X | | X | X | | X | X | |
| (Aprianingsih, 2022) | X | X | | X | | X | X | X | X | X | | | X | |
| TOTAL | 17 | 29 | 2 | 12 | $\frac{1}{0}$ | 18 | 15 | 28 | 25 | 12 | 16 | 6 | 31 | 9 |

Source: Own work

Nemes Zsófia²⁶

Eco-industrial parks: global standardization and institutionalization of the concept

The present paper aims to give an overview of the role of international organizations in the development of eco-industrial parks (EIP) worldwide. The study introduces the term of EIP and explains why and how an international framework and an institutionalized background could contribute to the harmonization of the currently present diverse logic and thinking behind the concept. The author reviewed the publications of the selected international organizations which are actively seeking ways to improve the existing eco-industrial parks, as well as trying to spread the practice globally.

Keywords: eco-industrial parks, UNIDO, international framework, GEIPP

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Introduction

The term 'eco-industrial' park has been known roughly since the 1990s. This term refers to a facility that is created and operates based on novel, innovative environmental solutions and concepts, thereby contributing to the renewal of traditional industrial sectors, and with sustainability in mind, is able to create high added value in both the economic and social dimensions. In case of the eco-industrial parks, choosing a location is a complex process: in addition to the obvious consideration of good accessibility and transport infrastructure, aspects such as environmental and resource management or the protection of ecosystems also appear. Based on all of this, it can be stated that the concept of eco-industrial parks can essentially be interpreted as part of sustainable spatial planning (or as a response to it), and that it carries the most important objectives of the circular economic model in all its elements. The paper is going to review the main dynamics of the recent years' EIP development, with a special focus on the international framework and standards created by UNIDO (United Nations Industrial Development Organization) and its partners, the World Bank and GIZ (the German International Development Agency). The author aims to present what is the role of these actors in developing, institutionalizing, standardizing and mainstreaming eco-industrial parks globally, in which form they have contributed to a more sophisticated and solid theoretical and practical foundation of EIP development.

Theoretical background of EIPs

Organizing industrial activities and industrial parks can be considered as a spatial planning intervention. Following circular models has become a current ambition of planning (Németh et al. 2023), however, integrating sustainability into spatial planning and development activities has a longer tradition. Sustainability considerations have got into the focus of spatial planning and territorial development at European (Sütő et al. 2010; Péti 2011) and also global level (e.g. Benedek 2021) in the last decades. The same can be experienced in the case of urban development (New Leipzig Charter 2020; Salamin 2022), with special emphasis on new ideas of smart and climate friendly cities which are becoming leading issues in urban development worldwide (Salamin 2021).

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In the new, EU dominated approaches of local urban and territorial development strategies, the themes of sustainability significantly increased during the last two decades (Salamín 2018), while the application of eco-oriented solutions enhance the attractiveness of localities especially for skilled and young individuals (Varga et al 2020). Not only direct planning and development interventions but also social innovation potential of a region (Kocziszky et al. 2015) can be the drivers of applying sustainability-oriented organizing and management solutions in industrial parks.

Industrial parks can serve as key platforms for planning and managing industrial activities in a territorial way or in a regional dimension. Therefore, industrial parks can have a crucial role in achieving territorial sustainability. Territorial sustainability-related development intentions try to keep the flows of materials, energy, income and knowledge inside of a region as long as it is possible (Péti 2012).

Another theoretical approach of the development of eco-industrial parks can be found in the science and literature of industrial ecology: the efforts to exchange raw materials and resources between companies, increase efficiency, and minimize waste emissions create forms of organizations that the literature describes as industrial symbiosis (Gertler 1995; Ayres – Ayres 2002; Allenby – Graedel 1993; Ehrenfeld 2004). At the same time, the transition between theory and practice is rather difficult, and researchers dealing with industrial ecology and symbiosis are often criticized for the fact that their work is almost exclusively descriptive, about hypothetical models and material flows, but does not provide enough concrete proposals and practical ideas for traditional industries, how to make their linear approach and production models more sustainable, to promote transformation (Gibbs – Deutz 2007). It is important to state that two companies that cooperate in some way are not enough to realize industrial symbiosis, e.g. in the exchange and reuse of waste or by-products, but according to the definition used by Chertow (2000), this requires at least three different actors and the sharing and exchange of at least two different types of resources. Roberts (2004) talks about the clustering of companies with similar waste and material flows, which can contribute, e.g. for the spatial concentration of waste management, to achieve synergistic effects, and to create individual and collective business benefits. This is the guiding principle behind the creation of eco-industrial parks, where economic, environmental and social benefits can arise from the collaboration of participating actors.

The idea that industrial production can only function sustainably if the sector tries to realize the cyclicity and optimized flow of materials known from nature and organic systems (ecosystems) is of course not new, but at the same time it only received great international attention after the UN summit in Johannesburg in 1992, both among politicians and business actors. The science of industrial ecology began to develop by leaps and bounds from the 90s, and set itself the goal of reinterpreting the operation of industrial infrastructures and facilities in a sustainable, circular system (Caroli et al. 2015).

The practical areas of the principles of industrial ecology are the so-called eco-industrial parks. These facilities create a higher added value for the stakeholders and provide more economic, environmental and social benefits than if they were to perform their activities independently (Lowe – Evans 1995). Compared to traditional industrial parks, eco-industrial parks have collective advantages from which, in addition to the businesses operating there, many other actors can benefit, e.g. other partners, institutions and companies involved at the regional level, which contribute to the maintenance of the ecosystem (Bellantuono et al. 2017; Barrera Saavedra et al. 2017). Figure 1 summarizes the major characteristics of eco-industrial parks in terms of environmental impacts, however, it is important to highlight the socio-economic interdependencies of the below mentioned specifics as well, as each of them are related to a various set of social and economic aspects and potential benefits too.

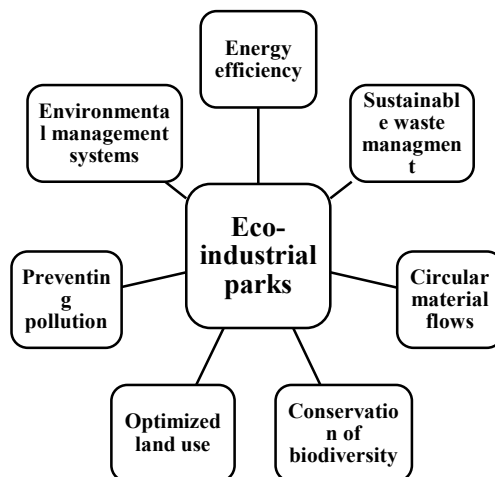


Figure 1: The main characteristics of eco-industrial parks, source: the author's own work based on Massard et al. (2014) and Conticelli & Tondelli (2014)

Evaluation of the practice of eco-industrial parks based on the international EIP framework

Analytical evaluation of the development of eco-industrial parks through green- or brownfield investments, as well as of international good practices and experiences, is at least as much the task of practical experts, policy-making bodies and institutions as it is of representatives of theoretical science. Whether we look at the countries of the developed or the developing world, with very few exceptions, we can everywhere find research, reports, documents prepared by government institutions and international organizations that analyze the connections between the circular economy and the sustainable development of industry, formulate goals, plans, and a vision for the future. The UN is no exception among international organizations which have been intensively dealing with the issue for years. UNIDO (United Nations Industrial Development Organization) is a specialized organization of the UN that supports sustainable, inclusive industrial development worldwide, in accordance with the Sustainable Development Goals (SDGs) of the UN. UNIDO's activities can be aligned with each of the 17 sustainable development goals, but the most direct connection is with goal number 9, which is about the creation of adaptive and sustainable industry, innovation and infrastructure (United Nations Information Service n.d.). UNIDO supports the complex sustainability reform of the industrial sectors of emerging countries with both financial and non-financial resources, with particular regard to the application of the principle of circularity and the CE²⁷-compliant development of industrial parks and similar facilities (unido.org; n.d.)

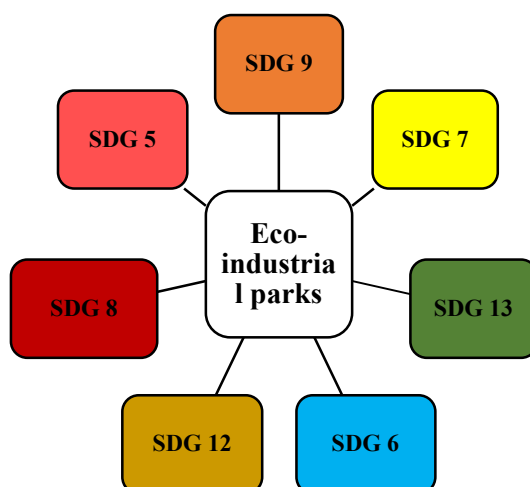
On behalf of the UN, UNIDO (United Nations Development Organization), carried out an international comparative research in 2020, involving about 50 industrial parks from 8 different developing countries (Colombia, Egypt, Indonesia, Nigeria, Peru, South Africa, Ukraine, Vietnam) (van Beers et al. 2020). The organization supports eco-industrial park projects in many parts of the world, which are managed in an integrated manner and are seen as particularly important sites for cooperation networks between cities and industry, government actors, the civil and corporate spheres and local communities.

The theoretical and methodological basis of the empirical study was provided by the international framework developed by UNIDO, with the cooperation of the World Bank and GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), the German International Development Agency. The first version of the document was published in 2017, followed by version 2.0 in 2021, reflecting the very significant international interest and demand for a single, coordinated EIP

²⁷ Circular economy

framework (World Bank 2021). The international framework responds to the environmental, economic and social sustainability challenges of the industrial activities of developing countries, and defines the planned development of eco-industrial parks as a normative goal, for which it intends to provide a practice-oriented reference base, especially considering that the countries named and examined in the document are also partners of all three organizations (UNIDO, WB, GIZ) in many significant international development projects. The publication emphasizes that the development of eco-industrial parks at international level can be clearly integrated into the context of the UN Sustainable Development Goals (SDGs) and the objectives of the Paris Climate Agreement. Figure 2 shows the connections between the Sustainable Development Goals and eco-industrial parks. Besides the obvious relevance of SDG 9 (Industry, Innovation and Infrastructure), the complex system of the value added created by eco-industrial parks can be related to affordable and clean energy (SDG 7), gender equality (SDG 5), decent work and economic growth (SDG 8), as well as climate action (SDG 13), responsible consumption (SDG 12) or clean water and sanitation (SDG 6).

Figure 2: Connections between EIPs and the UN SDGs; Source: the author's own work based on World Bank (2021)



The goal of the above-mentioned three international organizations was to create a common conceptual framework along which cooperation related to EIPs can be promoted and to develop the idea of a uniformly defined reference framework for all parties involved (national governments, civil organizations, companies, etc.), to be created based on international standards which did not exist before. In addition to uniform international conceptual frameworks, from a practical point of view, an indicator system is primarily needed that makes the individual EIP developments and initiatives comparable and creates the opportunity for a comprehensive performance evaluation (benchmarking) based on predetermined aspects, environmental, social and economic criteria. Among these conditions, compatibility with existing, internationally accepted legislation and standards appears with great emphasis, among them e.g. international agreements on environmental or social issues (see e.g.: international environmental protection conventions adopted by the UN and its specialized organizations, human, minority and labor law agreements) (Kechichian – Jeong 2016, UNIDO 2019).

The 2021 study published by UNIDO, the World Bank and GIZ defines four main pillars through which international EIP practices and specific case studies can be examined in a standardized performance evaluation framework. The four dimensions are park management, environmental, social and economic performance, and the indicators were defined grouped around them.

The purpose of the document and framework – which is of course not legally binding – is to

harmonize and coordinate the very diverse thinking, theoretical-methodological and policy-oriented considerations on eco-industrial park developments, start more effective cooperation projects than before, with the participation of all actors involved, in order to create circularity, energy-efficient industrial production and sustainability.

Van Beers and his co-authors (2020) reflected on the first, 2017 edition of the study jointly published by UNIDO, the World Bank and GIZ, and drew attention to the generally experienced performance gaps that characterize the EIP initiatives of all the countries examined, either from a management or environmental perspective. It is important to mention the strengthening of the business approach in case of those parks that are managed purely by the public sector (local or central government body), as well as the 'customized' development concept that takes the country-specific characteristics into account as much as possible. Another defining aspect is that, based on the framework and benchmarking system linked to UNIDO, the parks with the greatest development potential should be supported most significantly, namely in the area where the given facility is the most outstanding and provides performance that best meets the evaluation criteria. Figure 3 presents the general steps and concrete actions required in order to create an international EIP framework, from ensuring commitment to the operational level.

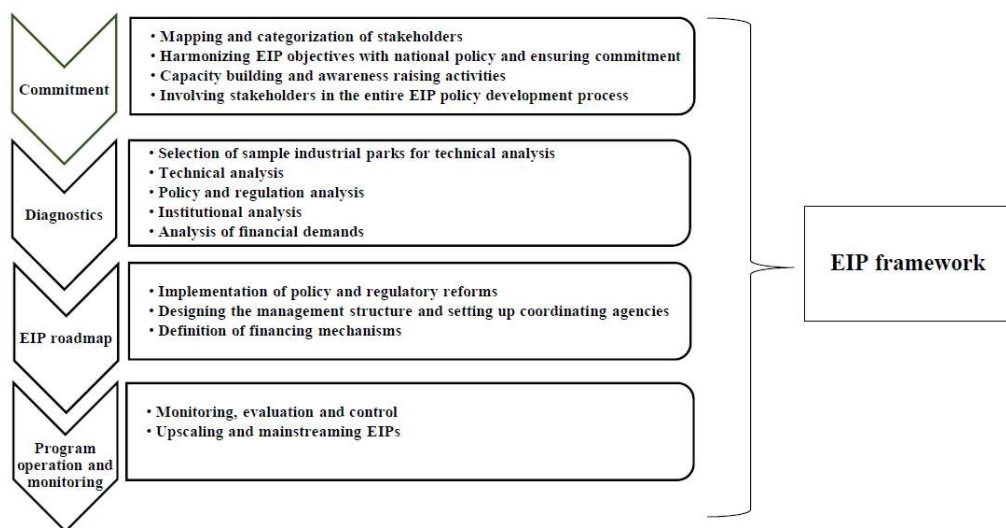


Figure 3: The steps of creating an international EIP framework; source: the author's own work based on UNIDO (2018) and Massard et al. (2014)

Upscaling and mainstreaming EIPs

Economic production and development based on the circular principle, comprehensive innovations affecting the industrial sector, and the inclusion of eco-industrial parks in the policy mainstream appear in local, regional and national level initiatives and projects, but at the same time they are also taking on an increasingly dominant role in thinking and acting at the global level. This process is well illustrated and supported by the GEIPP, or Global Eco-Industrial Parks Programme, which was launched in 2018 under the auspices of the United Nations Industrial Development Organization (UNIDO), specifically to make the economies and industrial sectors of developing countries more sustainable and competitive (UNIDO 2018).

The goal of the GEIPP, which was launched under the coordination and leadership of UNIDO, is dual: concrete development assistance appears with the same emphasis on projects supporting industrial sustainability in some developing economies, as does the development of knowledge on a global level, the promotion of the unification of conceptual frameworks and indicators, and an

international dialogue on eco-industrial parks. The project, planned for a period of 5 years, involves industrial parks, small and medium enterprises, as well as business and professional organizations in the partnership, and its geographical target areas are Colombia, Peru, Egypt, Indonesia, South Africa, Ukraine and Vietnam (UNIDO 2018).

When reviewing the history of the development of eco-industrial parks on a global level, we can conclude that the foundations of the concept are by no means brand new (as, of course, neither is the circular economic model itself, since these cyclical processes have been operating in the nature for millions of years), but we can talk about an evolution which originates from the the EIPs and industrial symbioses established in the Scandinavian countries, starting from the 1960s and 70s – see, for example, Kalundborg Symbiosis of Denmark, one of the most commonly cited case studies in the literature (Schwarz – Steininger 1997; Valentine 2016). In the next stage of development, in the 1990s, the concept continued to spread to other European states with a less developed commitment to sustainability than the Scandinavian ones, as well as to the USA, Canada and Japan, among others – so it is important to highlight here that we are talking about a group of the most developed economies. The 21st century has brought a change which still clearly dominates the global trends of EIP development even nowadays: from that time, dynamically developing economies began to embrace the concept, especially the newly industrialized Asian countries (Kechichian – Jeong 2016).

Kechichian and Jeong (2016) draw attention to the significant change that took place from early 2000s to the present times in terms of the geographical distribution of eco-industrial parks: while in 2000 only 10% of all EIPs were in non-OECD member states, by 2016, this ratio was already over 30% and shows dynamic growth. It is also important to point out that the majority of the EIP development models are brownfield investments (i.e. converting an existing facility), with 59%, while new, greenfield developments account for 34% of all projects. In international practice, we can also encounter spontaneous, unplanned development, but only in 7% of the registered cases (in 2016, there were 254 EIPs registered globally, including the planned ones and those currently being developed).

The available statistical data on the increase in the number of eco-industrial parks and their geographical coverage shed light on the clear trend that can be seen in this field among the group of developing and emerging countries since the 2010s. In connection with the topic, the concept of 'mainstreaming' (Kechichian – Jeong 2016), mentioned many times in the literature, best expresses what the global, normative goal can be in the development of EIPs: they should not be merely an alternative to traditional, linear production and consumption systems, but represent the mainstream of development policy. The prerequisite and key to 'mainstreaming' is a unified international conceptual/interpretive framework, the construction of the eco-industrial park as a brand, as van Beers et al. (2020) emphasized.

Conclusions

The purpose of the brief presentation of the above-discussed literature, policy documents and initiatives was to highlight the dynamically growing importance of the topic of eco-industrial parks in the institutional system of international development policy. Based on the last 7-8 years period, we can clearly see the enhanced demand on globally standardized schemes, tutorials, guidelines and benchmarks in the field of eco-industrial park development. Theoreticians, decision makers and practical experts may find a common point in the normative aim to establish an international system which can create the frames of mainstreaming industrial symbiosis as the most sustainable and beneficial concept of industrial production and development. The major players in this process are UNIDO, GIZ and the World Bank which have been engaged in promoting the idea primarily – but not exclusively – in their developing partner countries.

References

- Ayres, R. U. – Ayres, L. W. (2002): A Handbook of Industrial Ecology, Edward Elgar Publishing, <https://EconPapers.repec.org/RePEc:elg:eebook:2224>
- Barrera Saavedra, Y., Iritani, D., Pavan, A. L. & Ometto, A. (2017): Theoretical contribution of industrial ecology to circular economy. *Journal of Cleaner Production*, 170. 1514-1522. <https://doi.org/10.1016/j.jclepro.2017.09.260>
- Bellantuono, N., Carbonara, N. & Pontrandolfo, P. (2017): The organization of eco-industrial parks and their sustainable practices. *Journal of Cleaner Production*, 161. 362-375 <https://doi.org/10.1016/j.jclepro.2017.05.082>
- Benedek, J. (2021): Fenntartható fejlődés: banális metaforától korunk meghatározó területfejlesztési paradigmájáig. *Észak-magyarországi Stratégiai Füzetek*, 18(3), 4-14. <https://doi.org/10.32976/stratfuz.2021.39>
- Caroli, M., Cavallo, M. & Valentino, A. (2015): Eco-Industrial Parks: a green marketing approach. Luiss University Press, ISBN: 978-88-6856-042-3
- Chertow, M. R. (2000): Industrial symbiosis: Literature and taxonomy. *Annual Review of Energy and the Environment*, 25, 313-337. DOI:10.1146/annurev.energy.25.1.313
- Conticelli, E. – Tondelli, S. (2014): Eco-Industrial Parks and Sustainable Spatial Planning: A Possible Contradiction? *Administrative Sciences*, 4, 331-349 DOI:10.3390/admsci4030331
- Ehrenfeld, J. (2004). Perspectives on Industrial Ecology. *Ecological Economics*. 49. 107-109. 10.1016/S0921-8009(03)00270-2.
- Gertler, N. (1995): Industrial Ecosystems: Developing Sustainable Industrial Structures thesis. Technology and Policy Program, Engineering Systems Division, Massachusetts Institute of Technology, Cambridge, MA.
- Gibbs, D. – Deutz, P. (2007): Reflections on Implementing Industrial Ecology through Eco-Industrial Park Development. *Journal of Cleaner Production*. 15. 1683-1695. 10.1016/j.jclepro.2007.02.003.
- Graedel, T. E., Allenby, B. R. & Linhart P. B. (1993): Implementing industrial ecology. *IEEE Technology and Society Magazine*, 12 (1) 18-26, doi: 10.1109/44.192717.
- Kechichian, E. – Jeong, M. H. (2016): Mainstreaming Eco-Industrial Parks. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/24921> License: CC BY 3.0 IGO
- Kocziszký, Gy., Benedek, J., Veresné, Somosi M.; Balaton, K. (2015): Regionális társadalmi innováció generálása szakértői rendszer segítségével. *Észak-magyarországi Stratégiai Füzetek*, 12: 2, 4-22.
- Lowe, E. A. – Evans, L. K. (1995): Industrial ecology and industrial ecosystems, *Journal of Cleaner Production*, 3 (1-2) 47-53, ISSN 0959-6526, [https://doi.org/10.1016/0959-6526\(95\)00045-G](https://doi.org/10.1016/0959-6526(95)00045-G)
- Massard, D., O. Jacquet & D. Zurcher (2014). International Survey on Eco-innovation Parks. Learning From Experiences on the Spatial Dimension of Eco-Innovation. Federal Office for the Environment and the ERANET, ECO-INNOVERA, Bern. Environmental Studies, no. 1402: 310.
- Németh, K., Bai, A., Dobozi, E., Gabnai, Z. és Péter, E. (2023): Körforgásos gazdasági modell alapú városkonceptió, különös tekintettel a kis- és középvárosokra, *Tér és Társadalom*, 37(2), 62-81. doi: 10.17649/TET.37.2.3445
- Péti, M. (2012). A territorial understanding of sustainability in public development. *Environmental Impact Assessment Review*. 32. 61-73. 10.1016/j.eiar.2011.03.004
- Péti, M. (2011): A területi tervezés és fejlesztés a fenntarthatóság jegyében & stratégiai környezeti vizsgálatok földrajzi szemlélettel. JATEPress, Szeged, ISBN 978 963 315 024 5
- Roberts, B.H. (2004): The application of industrial ecology principles and planning guidelines for the development of eco-industrial parks: an Australian case study, *Journal of Cleaner*

- Production*, 12 (8–10) 997–1010. <https://doi.org/10.1016/j.jclepro.2004.02.037>
- Salamin, G. (2018): A földrajzi tér alakításának európaizálódása: Az Európai Unió térbeli stratégiáinak, tervezésének és kohéziós politikájának hatása az európai országok térbeli tervezési rendszereinek transzformációjára, PhD thesis, Szent István Egyetem
- Salamin, G. (2021): A tervezés változó formái az új governance korában: A területi és várostervezés 21. századi európai átalakulási trendjei, *Századvég* 1 : 1, 57-99.
- Salamin, G. (2022): A tükörtől az ökoszisztémáig: Szempontok a fenntarthatóság városfejlesztési dimenziójához, In: Benedek, J.; Nevelős, G. (szerk.) Átfogó ökológia: Párbeszéd hit és tudomány között a Laudato si' jegyében, Budapest, Magyarország: JTMR Faludi Ferenc Jezsuita Akadémia (2022) 239-267.
- Schwarz, E.J. – Steininger, K.W. (1997): Implementing nature's lesson: The industrial recycling network enhancing regional development, *Journal of Cleaner Production*, 5 (1–2), 47-56, ISSN 0959-6526, [https://doi.org/10.1016/S0959-6526\(97\)00009-7](https://doi.org/10.1016/S0959-6526(97)00009-7)
- Sütő, A., Salamin, G. and Szabó, P. (2010): Issues of Territoriality and Territorial Cohesion in the Revision of the TSP and the Territorial Agenda – a Sort of Connection between Geography and Regional Policy FORUM GEOGRAFIC 9: 9, 145-154.
- The New Leipzig Charter. The transformative power of cities for the common good (2020), retrieved from: https://ec.europa.eu/regional_policy/sources/docgener/brochure/new_leipzig_charter/new_leipzig_charter_en.pdf (accessed: 11 May 2023)
- UNIDO (2019): Eco-Industrial Parks – Achievements and key insights from the global RECP programme 2012 – 2018, retrieved from: https://www.unido.org/sites/default/files/files/2019-02/UNIDO_EIP_Achievements_Publication_Final.pdf (accessed: 13 May 2023)
- United Nations Industrial Development Organisation (n.d.), retrieved from: www.unido.org (accessed: 12 May 2023)
- United Nations Industrial Development Organization (UNIDO); World Bank Group (WBG); Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ); Ministry of Trade, Industry and Energy of the Republic of Korea (2018): A Practitioner's Handbook for Eco-Industrial Parks: Implementing the International EIP Framework. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/30458> License: CC BY 3.0 IGO
- United Nations Information Service (n.d.); retrieved from: https://unis.unvienna.org/unis/hu/topics/sustainable_development_goals.html (accessed: 13 May 2023)
- Valentine, S. (2016). Kalundborg Symbiosis: Fostering Progressive Innovation in Environmental Networks. *Journal of Cleaner Production*. 118. 65-77, <https://doi.org/10.1016/j.jclepro.2016.01.061>
- van Beers, D.; Tyrkko, K.; Flammini, A.; Barahona, C.; Susan, C. (2020): Results and Lessons Learned from Assessing 50 Industrial Parks in Eight Countries against the International Framework for Eco-Industrial Parks. *Sustainability* 2020, 12, 10611. <https://doi.org/10.3390/su122410611>
- Varga, V., Teveli-Horváth, D. & Salamin, G. (2020): A fiatal, képzett lakosságot vonzó potenciál a Budapest körüli csapágyvárosokban. *Területi Statisztika* 60: 2, 179-210. DOI:10.15196/TS600204
- World Bank (2021): International Framework for Eco-Industrial Parks v.2. Washington, DC: World Bank.

Kovács Teréz²⁸

**Hogyan lett egy termelőfaluból szolgáltató falu?
Társadalmi gazdasági átalakulás Erdőbénye példáján²⁹**

A tanulmány Erdőbénye szociológiai és regionális szempontú településtörténetét mutatja be. Erdőbénye a 16. század derekán – a hegyaljai településcsoport részeként – vált Európa-szerte ismert és magas minőségű borvidékké, majd erre kiépült egy piacképes árucseré-forgalom. A 19. és 20. században megnyílt két bánya, amelyek közül ma már egyik sem működik. Az erdőbényeieknek a szocializmusban egészen az 1970–1980-as évekig kellett várniuk arra, hogy abban a rendszerben jobb legyen a megélhetőségük. A rendszerváltás után munkanélküliség, elvándorlás és a falu lakosságának elöregedése állt be. Következésképpen megjelentek az üresen álló házak, amelyeket először a környező városok lakói megvásároltak és második otthonként használtak. Majd a 2000-es évek közepén-végén a városi felső középosztálybeli fiatal- és középkorúak, a dzsentrifikánsok kezdték el a házfelvásárlásokat, akik szőlőterületeket is vettek, és borászati vállalkozásokat hoztak létre, illetve a felújított helyi házakat panzióvá alakították. Ezekkel a vállalkozásokkal beindították a vidékturizmust Erdőbényén.

*Kulcsszavak: borászat, bányászat, idegenek betelepülése, dzsentrifikáció
JEL kód: R29*

**How did a farming village become a service village?
Socio-economic transformation in Erdőbénye**

This paper presents the sociological and regional-viewed settlement history of Erdőbénye. In the mid-16th century, Erdőbénye, as part of the group of Hegyalja settlements, became a well-known and high-quality wine-producing region renowned throughout Europe, and a trade of marketable goods was built on this. Two mines were opened in the 19th and 20th centuries, neither of which is still in operation. Under the socialist regime, the people of Erdőbénye had to wait right until the 1970s and 1980s for a better living under the system. After the change of regime, unemployment, emigration and an ageing of the village population took place. Consequently, empty houses appeared, which were first bought by people from the surrounding towns and used as second homes. Then, in the mid- to late 2000s, the urban upper middle class young and middle-aged gentrifiers started buying up houses, who also bought vineyards and set up wineries, and converted renovated local houses into boarding houses. These enterprises were the basis on which rural tourism was launched in Erdőbénye.

*Keywords: winery, mining, in-migration of foreigners, gentrification
JEL code: R29*

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Bevezetés

Tanulmányomban szociológiai és regionális szempontból Erdőbénye településtörténetét mutatom be három korszakon keresztül és minden korszakot még további két részre taglom: Az első korszak egy hosszú időszakot ível át, amely a középkor végétől a második világháború végéig tart. Ennek a kornak azért szentelem a legnagyobb teret, mert a mai viszonyokat vizsgálva, arra a

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²⁹ A tanulmány „A vidéki dzsentrifikáció szerepe a településfejlesztésben” FK 138098 NKFIH által finanszírozott kutatás keretén belül készült.

kérdésre szeretnék választ adni, hogy vannak-e napjainkban olyan társadalmi-gazdasági folyamatok, amelyek – a megváltozott körülmények között – ismétlődnek, párhuzamba állíthatók egyes korábbi korszakra jellemző folyamatokkal? A második időszak a létező szocializmust, a harmadik pedig a rendszerváltás utáni korszakot öleli fel. E két utóbbi korszakban azt a kérdést vizsgálom, hogy hogyan tudtak a helyiek az adott kor radikálisan megváltozott körülményeihez alkalmazkodni?

Magyarország kistájainak katasztere szerint Erdőbénye az Észak-magyarországi-középhegység nagytájban, továbbá a Tokaj–Zempléni-hegyvidék középtájban és azon belül a Hegyalja kistájban található. A Hegyalja kistáj 100–514 méter tengerszint feletti magasságú erősen tagolt lejtővidék. Területhasznosítás szempontjából az erdő 46%, a szőlő 22%, a szántó 14%, a rét, legelő 11%-ot tesz ki. Éghajlata alkalmassá teszi, mind a szántóföldi növények, mind pedig a különböző gyümölcsök termesztésére. A szőlőtermesztésre pedig kiválóan alkalmas. A Hegyalja kistáj hét települése közül városi jogállású település nincs, vonzásközpontként Tokaj, Sárospatak és Sátoraljaújhely jöhet szóba (Dövényi 2010, 791–795). Beluszky Pál ettől eltérően egy nagyobb térséget, 22 települést sorol a (zempléni és abaúji) Hegyalja tájhoz. Ez utóbbit néprajzi szempontból a Felföld délkeleti csücskének is nevezik (Benkő–Wirth 2015). Az UNESCO Világörökség Bizottsága 2002-ben a Tokaj-Hegyalja Történelmi Borvidék 28 települését a kultúrtáj kategóriában felvette a világörökség listájára. Napjainkban ez a borvidék Magyarország legprominensebb borvidéke. Erdőbénye egyike a borvidék települései közül. „Az okleveles forrásokban a 15. század elejétől említett település a hegyekből lefutó Bénye-patak völgyében, festői környezetben jött létre” (Benkő–Wirt 2015, 141).

A múltban Erdőbénye híres személyiségei között kiemelkedett Szepesi Laczkó Máté, mint kora polihisztor (prédikátor, tudós és gazdálkodó személyiség), aki I. Rákóczi Ferenc és Lorántffy Zsuzsanna udvari szolgálatában állt és 1619–1624-ig krónikát írt a térség emlékeztető dolgairól, megemlítve a bortermelést és a borárakat is. „Amikor a krónikát befejezte (1624), mintegy jutalmul Erdőbényére³⁰ került, ahol jól jövedelmező prédikátori állásba került. 1629-ben leégett a falu. A templom, az iskola, a fejedelem borháza, a lőcseiek,³¹ Máté pap háza és még 50 bényei porta lett a lángok martaléka [...] Egyébként Laczkó Máténak mindennapi gondja volt a szőlőművelés, hiszem a prédikátor jövedelmei között három szőlő termését is számba vették. Annyi bora termett, hogy a templom felső szomszédjában fekvő szabad kúriában kocsmáros árulta azokat” (Zelenák 2012, 48). Szepesi Laczkó Máté emlékét ma Erdőbényén mellszobor és róla elnevezett emlékház őrzi, emlékének őrzése beépült a helyiek identitásába.

A térség fő helyi erőforrása a szőlőtermesztésre kiválóan alkalmas talaji- és mikroklimai adottságok és az erre épülő magas minőségű borkészítés, amit az itt élők a 15. és 16. század fordulóján alapoztak meg. Hosszú idők óta ugyancsak fontos erőforrás a fa és annak feldolgozása. A zempléni „hegyeket alkotó kiömlési kőzetek számos ásványi nyersanyagot rejtene, ezért évszázadok óta bányásznak az itt lakók” (Mednyánszky 2017, 8). Napjainkban új helyi erőforrás is megjelent, ez pedig a csodálatos táj, a csend, a tiszta és üde levegő, amely sok turistát vonz a térségbe, és nekik pedig megnőtt a különféle szolgáltatások iránti igényük.

A tanulmány első részében a szakirodalom másodlagos elemzésére hagyatkoztam. A szocializmus korát főleg a levéltári anyagokból tártam fel és néhány interjúalanyom visszaemlékezéséből állítottam össze. Erdőbénye rendszerváltás utáni szakaszában felhasználtam a 2015-ös³² és a 2022–2023-ban³³ félíg strukturált interjúk anyagát.

³⁰ A források szerint a 17. századelőn a falu neve még Erdő Bénye volt (lásd: Zelenák 2012, 49). Sőt egy 19. századi kataszteri térképen is Erdő Bénye szerepel. (lásd: Benkő–Wirth 2015, 141).

³¹ Lőcse szabad királyi városnak a háza a központban a mai Szirmai kastély helyén állt.

³² Kovács Teréz–Bodnár Zsuzsanna 2016: Erdőbénye hagyományos és posztmodern falu között félúton. Az interjúkat Bodnár Zsuzsanna készítette.

³³ „A vidéki dzsentifikáció szerepe a településfejlesztésben” című kutatás. Az interjúkat Kovács Teréz és Orbán Éva készítették.

Erdőbénye virágkora

A bemutatásra kerülő első korszakot a középkor végétől a második világháború végéig terjedő időszakban jelöltem ki. Ezt az időszakot összességében és a mai távlatokból szemlélve virágkornak nevezem, mert bár ekkor is voltak súlyos csapások, válságok, sőt még tragédiák is, de ebben a korban Erdőbénye a hegyaljai településcsoport részeként Európa-szerte ismert és magas minőségű borvidékké vált, majd erre kiépült egy piacképes árucseré-forgalom – mai szóval élve marketing – ami a lengyel piacok megszerzésében ért a csúcra. Mindez, attól a kortól kezdve egészen napjainkig, fontos hatást gyakorolt az ott élő emberek megélhetésére.

A minőségi borkészítés megteremtésének rögös útja

Előjáróban – Zelenák István kutatásaira hivatva – kiemelem, hogy a középkori Magyarország leghíresebb borvidéke a szerémi borvidék³⁴ volt. Az ott előállított borok nagyon jó felvevő piacra találtak a Mátyás király udvarában és külföldön egyaránt. A 15. század végén Sopronban és Ruszton is készítettek és külföldre is szállítottak a szerémi borhoz hasonló borokat. A művelés munkálataiban ez utóbbi borvidékek is megelőzték a Hegyalját. „A Tokaji-hegy szőlőművelése már a 15. században kiemelkedett az átlagos termőhelyek közül” (Zelnák 2012, 16), de nem volt dobogós helyen. Ebből a helyzetből kellett az első helyre felkerülnie; amihez hozzájárult, egyrészt a szerémi bor fénykorának gyors leágazása az 1520-as évek elején. A szerémi borvidék fénykorának leágazása leginkább azért következett be, mert a török terjeszkedés elérte és megsemmisítette a vidéket. Másrészt a Hegyaljától északra található szabad királyi városok és a szepesi mezővárosok és azok kereskedő polgárai jó üzleti megérzésének köszönhetően, még a szerémi borvidék fénykorában³⁵ érzékelték, hogy a bor iránt megnyilvánuló lengyel igényt nem a távol eső vidékek drágán vásárolt boraikkal, hanem olcsóbb hegyaljai borokkal célszerűbb kielégíteni. A 16. században már a lengyel főurak mellett a szélesebb társadalmi rétegek is kérték a magyar bor szállításában résztvevő birtokosokat és kereskedőket, hogy küldjenek (hegyaljai) borokat. A megnövekedett kereslet meghozta a megfelelő árakat is.

A török terjeszkedés előtt a délvideki főurak már a 15. században a békésebb északi tájakra költöztek és igyekeztek ezen a borvidéken birtokot szerezni. Rajtuk kívül a szerb fejedelmek is kaptak cserebirtokot, akiket köznépi tömegek követtek. A mohácsi csata után Perényi Péter 1527-ben áttette birtokközpontját Siklósról Sárospatakra és a jobbágyságot is tömegesen telepítette Sárospatakra és a többi környező településre. Ez pedig új szőlőfajok elterjedésével járt (Zelenák 2012). „Az igazi áttörés a minőségi bortermelés terén az aszúbor felfedezése (16. század dereka), majd rendszeres előállítása jelentette; az aszú ismertté, kedvelté vált az igényes fogyasztók körében. Rendszerré szerveződött a borkereskedelem” (Beluszky 2022, 8).

Bár az időszak a feudalizmus kora, de ennek ellenére „a szőlők ugyanis nem tartoztak a jobbágyteleki állományhoz (bár utána tulajdonosa feudális szolgáltatásokkal tartozott a földesúrnak). Ez lazította a jobbágykötelezettségeket, a tehetősebb jobbágyok szőlőt vásároltak, gyarapodhattak, adóikat pénzben róttak le (tehát nem robotoltak), sokan közülük az ún. taxás nemések közé emelkedtek” (Beluszky 2022, 7). Ez azt jelentette, hogy a szőlőterületek és a borok adásvétel tárgyát képezték, amelyben nemcsak a főurak, hanem attól szélesebb körök – a városok, azok kereskedői, tehetősebb jobbágyok, az egyházak is – piaci szereplőké váltak.

A szőlőbirtokok szabad forgalma és a borkereskedelem fellendülése vonzotta az embereket Hegyaljára. A fent említett szerémi borvidék fénykorának vége felé a Hegyalján is a szőlőművelés egyre igényesebb lett,³⁶ ami megnövelte a munkaerőigényt. Az egyszerű napszámos munkát a helyiek mellett szlovákok és lengyelek is végezték. A térségbe való beáramlás először népes

³⁴ Szerémség a mai Vajdaság déli, Duna és Száva folyók közötti része.

³⁵ „1500 és 1523 között még a szerémi borok ára volt a legmagasabb. Az időszak kezdetén ez a duplája volt a hegyaljai bor árának” (Zelenák 2012, 31).

³⁶ A 13–15. században terjedt el a szőlők karózása, kétszeri, majd háromszori kapálása, korszerűsödött a bor készítése, pincéket ástak, fahordókban érlelték a bort (Beluszky 2022)

községek kialakulásához vezetett, majd ezek a megnövekedett létszámú falvak bizonyos fokú autonómiára tettek szert azáltal, hogy mezővárosi jogállást szereztek. „Végül is a 13–17. század folyamán 12 hegyaljai település nyert mezővárosi kiváltságot: a 15. század előtt Sátoraljaújhely, Patak és Tolcsva, a 15. században Tokaj, Tállya, Tarcal, Szerencs, Olaszliszka, Abaújszántó, a 16–17. században Mád, Erdőbénye és Bodrogkeresztúr. A hegyaljai mezővárosok közül városiasságával kiemelkedett Patak, a szokványos mezővárosi funkciók mellett a település főúri rezidencia, uradalmi központ, katonai erősség, szellemi műhely-iskolaváros, jelentős a kézműipar a belvárosának településképe is városias” (Beluszky 2022, 9). A többi mezőváros minimum vásártartási joggal rendelkezett, de ez önmagában is elősegítette a borkereskedelem és a kézműipar fejlődését.³⁷

A 15. században a felvidéki szabad királyi városok – Kassa, Eperjes, Bártfa – a saját hasznukra igyekeztek kihasználni a Hegyalján termelt bort, polgárai 1500 és 1526 között már jelentős tételben vásároltak bort és szőlőterületeket is Hegyalján. „A szőlő és borgazdaság irányítását a városok tanácsnokokra bízta, akik évente beszámoltak a kiadásokról és bevételekről. A szőlők ügyeit konkrétan a vincellérek irányították, akik mezővárosi lakosok, esetenként a szőlő előző tulajdonosai, vagy szomszédjai voltak. Kisebb munkákat maguk is elvégeztek. Az első és a harmadik kapálásra bérmunkásokat fogadtak fel. A napszámra és eszközökre a kiadást a város biztosította” (Zelenák 2015, 29). A szőlő művelését és feldolgozását helyben kellett biztosítani, ezért a városok házat és pincét vettek azokban a falvakban, ahol a szőlőbirtokuk volt. A szabad királyi városoknak a városháza alatt volt a borospincéjük és a saját kocsmáikban árusították készleteiket. A birtokosok közül többen már ez időszakban kifejezetten eladásra termeltek bort, a szőlőművelésben bérmunkásokat alkalmaztak, a bor értékesítésében pedig kialakulóban volt a kapcsolatuk a kereskedő polgárokkal (Zelenák 2012, 85–87).

Beluszky Pál tanulmányából is tudjuk, hogy a 15–16. században még Kisszebenről, Lőcséről, Késmárkról, Ólublóból is jöttek borkereskedők a Hegyaljára, sőt ebben a korban a lengyelországi Krakkó is vásárolta-közvetítette a hegyaljai borokat. Sőt egyes városok továbbra is vásárolták a szőlőket. „A 16. század derekán Erdőbényén és a lizskai határban Lőcse egymás után vásárolt szőlőket, és a legnagyobb birtokos lett a település határában” (Zelenák 2012, 55). Ez a rendszer odavezetett, hogy a szőlőbirtokok nagy arányban kerültek az extraneusoknak (külbirtokosoknak) a tulajdonába. A 16. század végén és a 17. században az autonóm hegyaljai mezővárosok polgárai és a jobbágyfalvak is összefogtak és közösen felléptek a szőlőbirtoklás és bortermelés rendjének egységesítése céljából. „E törekvések legismertebb dokumentuma az 1641-ben Mádon tartott tanácskozás által elfogadott rendtartás, amely az évtizedes szokásjogot, illetve a korábban alkotott rendtartások előírásait vette alapul. E rendtartás(ok) legfontosabb törekvése a külbirtokosok (felvidéki, sőt lengyelországi városok, nemesek, egyházak stb.) beáramlásának fékezése volt (amit a szőlőbirtokok szabad adásvétele tett lehetővé); a „bebírók” a Hegyalja által megtermelt extra jövedelmek egy részét „kivitték” a tájról; eszköze pedig elsősorban a hegyaljai települések extra eladásra kerülő szőlőbirtokokra vonatkozó elővásárlási jog biztosítása volt” (Beluszky 2022, 8–9).

A 18. században az orosz és a skandináv boreladásával is bővült a hegyaljai borkínálat. Ebben a korban azonban a birtokosok és a kereskedők jórészt elveszítették szerepüket a borkereskedelemben, és helyüket a görögök és a zsidók vették át. A 17. században a Habsburg Birodalom távolabbi vidékeiről is érkeztek a Hegyaljára izraeliták, az „első képviselőik úgynevezett „faktorok” voltak, akik a helyi termelők és a térben távoli fogyasztók közelében működő kereskedők között közvetítettek. Tevékenységüket a vármegyei és a városi hatóságok – főként a legértékesebb aszúborokat illetően – a borminőség védelmére hivatkozva szigorúan szabályozták, sőt korlátozták” (Benkő–Wirth 2015, 7). A népszámlálási összeírásokból látható, hogy Erdőbényére (1. táblázat) még a 19. század első felében sem érkeztek izraeliták.³⁸ Hiszen,

³⁷ Erdőbényén a vásárokat a Miskolc–Sátoraljaújhely közötti útról a zempléni hegyek belsejébe vezető országúton a Nagy utcában, a mai Kossuth utcában tartották.

³⁸ Benkő–Wirth ezt elsősorban Erdőbénye rossz közlekedési, s megközelíthetőségi helyzetével magyarázza.

míg 1840-ben Erdőbényén a lakosság mindössze 0,2%-át, ugyanakkor a szomszédos Olaszliszván már 6,8%-át írták össze izraelita lakosként. A következő négy évtizedben azonban dinamikusan nőtt az izraeliták/zsidók száma és gazdasági erejük is, és látni fogjuk, hogy egy későbbi nehéz korszakban az ő jelenlétük jelentősen hozzájárult Erdőbénye gazdasági válságból történő kilábalásából.

1. táblázat: Az izraelita vallásúak száma és aránya Erdőbényén (1840–1941)

Table 1: Number and proportion of Israelites in Erdőbénye (1840-1941)

| | 1840 | 1880 | 1910 | 1920 | 1930 | 1941 |
|-------|------|------|------|------|------|------|
| szám | 6 | 332 | 267 | 214 | 153 | 131 |
| arány | 0,2 | 16,0 | 11,1 | 9,0 | 5,2 | 4,2 |

Forrás: NÉDA Hosszú idősoros nemzetiségi adatok. A zsidó népesség száma településenként (1840–1941). Budapest, KSH, 1993. 368–369.

A történelmi események a felvázolt századokban igencsak megnehezítették az akkori hegyaljai, benne az erdőbényei lakosok életét: állandó háborús állapotok uralkodtak, a Rákóczi-szabadságharc legközvetlenebbül ezt a térséget érintette. „A település történetében tragikus esemény volt a 1739-es kolerajárvány, amelyben több mint 500 ember halt meg és amelynek második, 1831-es hulláma szintén sok áldozatot követelt” (Tóbiás 2020, 218). Emléküket egy „koleraoszlop” is őrzi a falu határában. A népességfogyás oda vezetett, hogy a házak, telkek egy része üresen állott, a legdrágább művelhető és ugyanakkor legértékesebb szőlőterületek műveletlenül maradtak. A 18. század Lengyelország a cári birodalom, Poroszország és a Habsburg Birodalom közötti felosztásával a lengyel felvevőpiac kereslete is drasztikusan csökkent. A bor árát és mennyiségét tovább csökkentette a „bécsi udvar” kiviteli vámja, a borkereskedelemben is érdekelt görög kereskedők kiűzése az országból és egyéb megszorítások, korlátozások. Megjelent a borhamisítás, s ezzel a táj presztízse csökkent. Egy-egy békésebb korszak – például a szatmári béke – után, a Hegyalja újjáéledt, növekedett a lakosság, érkeztek jövevények is Rátkára, Hercegkútra, Királyfalvára német ajkúak, újratelepítették a szőlőket és helyreállt a borkereskedelem.

A polgárosodás útján...

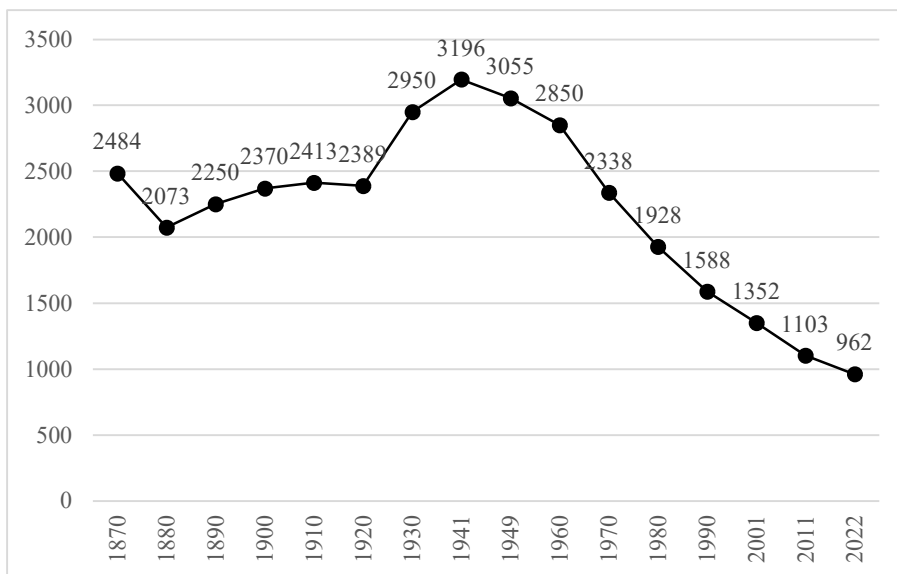
Az 1848-as szabadságharc egyik nagy eredménye a jobbágyfelszabadítás volt. Ezzel a mezővárosok jobbágy jogállású lakói is szabad polgárok lettek, bár a mezővárosoknak a környező jobbágyfalvakhoz képest kedvezőbb jogi-társadalmi helyzetük megszűnt.

1885 filoxéra járványa elérte a Hegyalját is, aminek végzetes következménye lett. Néhány év alatt kipusztult a szőlőterületek közel 90%-a. A borgazdaság összeomlása munkanélküliséghez és elszegényedéshez vezetett az egész térségben. A 19. század végén egyes hegyaljai településeken új városfejlesztő tényezők jelennek meg: vasút, gyáripár, polgári közigazgatás térségi hatáskörű intézményei. A folyamatnak legnagyobb nyertese Sátorajjáújhely, mint Zemplén vármegye székhelye – a vármegyében egyedülként – rendezett tanácsú városi joggal bírt, igazgatási központ mellett vasúti csomóponttá vált, gyáripár is épült és lakossága nagyon dinamikusan nőtt.³⁹ Szerencs járási székhelyé vált, vasúti forgalma és cukorgyára lett, Patak iskolavárosként és kistáji központként tovább erősödött. A gazdasági válságból – mondhatjuk úgy is, hogy a filoxéra-pusztításból – a fenti települések úgy lábaltak ki, hogy profilváltást hajtottak végre. Hegyalja többi, főleg addig is kisebb létszámú települései, többek között Erdőbénye is, erre alig volt képes. A fő megélhetési forma továbbra is a borgazdaság lett. Megkezdődött a szőlőterületek rekonstrukciója és „1907-re az 1870-es szőlőterületeknek 62%-án díszlett újra a szőlő” (Beluszky 2022, 10).

³⁹ Sátorajjáújhely lakossága: 1870: 11579, 1910: 21575 fő. (Beluszky 2022).

Erdőbényén 1870–1880 között volt egy jelentős lakosságszám csökkenés (1. ábra), ami az említett járváynak tudható be, a lakosság pótlására viszont érkeztek izraeliták. 1880-ban a valaha mért legmagasabb lett az ott élő izraeliták/zsidók száma (332 fő) és aránya (16 %) (1. táblázat). Tevékenységük hozzájárult a kőbányászat felvirágoztatásához is. „Számos adat bizonyítja, hogy a 19. század második felében termelését dinamikusan növekvő kőbánya külföldiek tucatját: olasz, osztrák származású szakembereket vonzott a településre. A különösebb szakértelmet nem igénylő munkafázisokat, azaz magát a kőfejtést helyi lakosok végezték. 1899-től új tulajdonos, az izraelita Beck Sámuel fejleszti a bányát, a következő két évtized az üzem virágkora. Az irányításában népes rokonságának tagjai is részt vettek” (Benkő–Wirt 2015, 140).

Ugyanabban az évben, amikor Beck megvette a bányát kőfaragó üzemet is létrehozott a falu déli határában. A szerzőpáros kutatása szerint az Iskola (ma Hunyadi János) utcában 80 x 100 négyzetméter alapterületű zsinagóga, mellette zsidó iskola, a patak partján pedig mikve⁴⁰ állt. A ma is álló temetőjükben a sírkövek nagy részének készítője a híres zsidó kőfaragó Kőgel Márkus Ábrahám volt. Erdőbényén az ortodox irányzattól különvált egy kisebb neológ izraelita irányzat és ők az 1930-as években külön neológ temetőt alakítottak ki. A mai Kossuth és a Hunyadi utcákban a 19. században számos zsidóház állt. Ezekben az egyemeletes vagy földszintes, terméskőből faragott igényes épületekben nemcsak laktak a tulajdonosok, hanem ott voltak a kereskedelemmel, kézműiparral és vendéglátással foglalkozó vállalkozásaik is, így méreteikben is jelentősen eltértek a hagyományos őslakosok házáitól. A hagyományos helyi stílusban épített magyarok házai ugyancsak terméskőből faragott, téglalap alaprajzú, hosszú cseréptetős épületek. Az utca felőli szobán két tágas ablak, az udvar felől kőoszlopos-tornác van; az épületek alatt pedig hosszú borospincék húzódnak. A lakóépületek a gazdasági épületekkel (istállók, ólak) folytatódik, majd a gyümölcsös és veteményeskert, illetve a kukorica és here föld következett. A helyi köznyelvben ezeket parasztházaknak hívják és a falu döntően ilyen házakból áll ma is.



1. ábra: Erdőbénye népességének alakulása, 1870–2022 (fő)

Figure 1: Evolution of the population of Erdőbénye, 1870–2022 (persons)

Forrás: KSH Népszámlálási adatok (1970–2021) és Magyarország helynévtára (2022)

⁴⁰ A zsidók hitéletének fontos eleme a rituális fürdésre kialakított fürdő.

Erdőbényén a borgazdaság és a kőbányászat mellett a fára és a kőre alapozott kisiparosok éltek: bognárok, kádárok, kőfaragók. A kádárok nemcsak hordókat, hanem a borászathoz szükséges egyéb faedényeket (kád, puttony) állítottak elő. A kőfaragók pedig lakóházak mellett, sírköveket, lépcsőket, kültéri padokat készítettek.

A korszak fejlődését megszakította az első világháború és a trianoni határ megvonása. Ezzel a Felföld/Felvidék városait, a hegyvidéki bor fő felfelvőpiacait határ és vám választotta el. A legnagyobb vesztes ezúttal Sátoraljaújhely, amely határváros lett és elveszítette területének egy részét, északi vonzaskörzetének pedig egészét. A két világháború között állandósultak a borértékesítési nehézségek. Ismét a bányászat irányában indult el a fejlesztés. „Erdőbénye mellett a szarmata korú gejzírtó-medencében 30–40 méter vastagságban kovaföld képződött, amit 1937-óta művelnek” (Dövényi 2010, 792).

A munkahelyek növekedését mutatja az is, hogy Erdőbényén a lakosságszám a két világháború között dinamikusan nőtt. Különösen vonatkozik ez a trianoni határmegvonás utáni első évtizedre (*1. ábra*), következésképpen Erdőbényén az 1941-es népszámlálás alkalmával mérték a valaha volt legnagyobb (3116) lakosságszámot (*1. ábra*). Ugyanezen népszámlálás alkalmával a helyi zsidók száma viszont már jelentősen csökkent (*1. táblázat*). 1941-ben már csak 131 zsidót írtak össze és ez a lakosság 4,2%-át tette ki, ami messze alatta maradt a Hegyalja települései átlag zsidó lakosságarányának. Az igazi nagy katasztrófa azonban ezután következett. „1942-ben 30 fiatal férfit munkaszolgálatosként a frontra hurcoltak. A többi erdőbényei zsidó útja 1944 tavaszán Tokajba, majd a sárospataki gettón át Auschwitzbe vezetett [...] A háború után talán egy tucat túlélő tért vissza Erdőbényére” (Benkő–Wirth 2015, 138–139). Közülük sokan kivándoroltak Izraelbe az 1950-es években, illetve Budapestre mentek. 1944-ig a zsidó családok döntően kereskedelemmel foglalkoztak. Boltjaik többsége szatócsboltok voltak, ahol sokféle árut lehetett kapni, gyakran hitelben is. Volt köztük vaskereskedő, rőfös (méterárus), trafikos, szabó, hentes, pék, cipész, szikvízgyártó. Benkő–Wirt írásai alapján a társadalmi ranglétra csúcsán a helyi kőbánya-tulajdonosok, a szőlőbirtokosok, malom- és kocsmatulajdonos zsidók álltak.

A két világháború között különösen fontos kiemelni falu történetében az iskolákat. Erdőbényén ebben a korban három felekezeti iskola volt: katolikus, református és zsidó. A levéltárban csak a Római Katolikus Elemi Népiskola anyakönyvi naplói találhatók meg. Az 1934/35-ös tanévben, az akkor még hatosztályos katolikus iskolában 294 tanuló járt.⁴¹ Jellemző, azonban, hogy a tanulók nagy része nem járta ki mind a hat osztályt. Ebben a tanévben az első osztályban 74-en, az utolsó hatodik osztályban pedig mindössze 26-an jártak, valószínűsíthető, hogy a szülők idő előtt kivették a gyerekeiket az iskolából, mert a munkában szükségük volt az ő segítségükre is.

Erdőbénye a szocializmus korában

A korszak elejéről csak a Magyar Nemzeti Levéltár Borsod-Abaúj-Zemplén megye Levéltára (B.-A.-Z.m.l.t) Erdőbényére vonatkozó forrásaiból és néhány helyi visszaemlékezéséből tájékozódhattam. Ez a fejezet is két részből áll: az első az, amikor a falu még a paraszti gazdálkodás korát élte, a második pedig a kollektív gazdálkodásra épülő Erdőbénye. Az 1944 decemberében Debrecenben megalakult Ideiglenes Nemzeti Kormány első intézkedése a földreform volt. A földreformmal minden párt egyetértett, de annak tartalmáról igencsak eltértek a pártok álláspontjai. Végül a Magyar Kommunista Párt elképzelése alapján a párt akkori ideiglenes földművelési minisztere, Nagy Imre 1945. március 18-án tette közzé a 600/1945.V. évi VI. tv. számú miniszteri rendeletet „A nagybirtok megszüntetéséről és a földműves nép földhöz jutásáról” címmel (Kovács 2020). Mivel Erdőbényén, az egykori Rákóczi – de már többszörös tulajdonváltást megélt – birtok révén volt nagybirtok is, így azt államosították és Tolcsva központtal ebből lett a Tolcsvai Állami Gazdaság. Abban az időben „volt négy állami gazdaság: volt az abaujszántói, volt a Tarcali Állami Gazdaság, volt a tolcsvai, meg volt az újhelyi. Ezeket mind összevonták, lett belőle Tokaj Hegyaljai Állami Gazdaság. Utána ebből lett egy

⁴¹ BAZVM Lt. VIII.109. Az Erdőbényei Római Katolikus Elemi Népiskola iratai.

Borkombinát, de az már a '70-es évek vége fele volt". Arról nincs adatunk, hogy az erdőbényeiek közül kisajátítás áldozatául esett-e középbirtokos, egyház vagy gazdag paraszt. Az viszont tudott, hogy volt földosztás és „az 1945-ös földosztó bizottság elnöke Vavrek Ferenc volt” (Kiss 2006, 158).

Az, hogy az 1950-es évek elején milyen volt a falu birtokszerkezete, arról közvetve értesülhetünk az erdőbényei községi begyűjtési iratokból. Erdőbényén az 1952–1953-as gazdálkodási évben összesen 235 gazdaságról készült olyan irat, ahová a gazdák begyűjtési kötelezettségeit jegyezték fel.⁴² Ezeken az iratokon a személyes adatokon túl szerepelt az is, hogy a gazdának hány katasztrális hold (kh)⁴³ földje van. A földeknek nemcsak az egész, hanem a tizedes számát is jelölték. A tizedes számokat 4-ig lefelé, 5-től felfelé kerekítettem és az egy holdasok csoportjába mindazokat besoroltam, akiknek 0,2–1,4 hold földjük volt. Így eljutottam a falu birtokszerkezetének felvázolásához (2. táblázat). Szembetűnő, hogy a legkisebb, tehát az 1,0 holdasok, illetve, még akkora földdel sem rendelkező gazdák, tették ki a legnagyobb csoportot, hiszen a gazdák 28%-a tartozott ide és az összes 3,0 kh alattiak alkották a gazdatársadalom felét, 52%-át. Továbbá, ahogy nőttek a földterületek, úgy csökkent a gazdák száma (2. táblázat). Az utolsó két csoportban – a kis létszám miatt – már összevontam a gazdák számát s így lettek a 12–14, illetve a 15–21 holdasok. 21 kh felül nem volt begyűjtésre kötelezett gazda Erdőbényén. Hektárra átszámítva csak az utolsó csoportban szereplő négy gazdának a földje érte el legalább a 10 hektárt. A falu három leggazdagabb földtulajdonosai akkor Majerik János (16 kh), Rozgonyi Mihály (17 kh) és Ungvári László (21 kh) voltak. Összességében Erdőbénye gazdatársadalmát ebben a korban jellemzően 5–8 tagú családok alkották és a falu egy szegényparaszti társadalom képét mutatta. Ennek ellenére a begyűjtési iratok adatai alapján a falu gazdáitól irreális terménybeszolgáltatást vártak el, amit a gazdák nem tudtak maradéktalanul teljesíteni. Az erdőbényei tanácsülésen állandó téma volt a begyűjtési és az adókötelezettségi helyzet ismertetése. A tanácselnök Szilai József erről így számolt be: „'52 első fél évben a begyűjtési tervet a következőképpen teljesítettük: tej 66%, tojás 85%, baromfi 112%, sertés 73%, szarvasmarha 100%. Azonban a törvény a gabonabeadásra is kötelez bennünket, az idei begyűjtési törvény arra is kötelez bennünket, hogy ez évtől minden dolgozó parasztnak kötelessége, hogy a cséplés után azonnal teljesítse beadási kötelezettségét”.⁴⁴ 1954. január 14-i tanácsülési jegyzőkönyv két fontos határozatot tartalmaz: Az „1) Erdőbénye történelmi szőlő- és gyümölcsstermesztésének fokozása érdekében fel kell kutatni a kopár és parlagterületeket és ezek gyümölcsfásítását és szőlőtelepítését biztosítani kell a termelészövetkezet és az egyéni gazdák útján. Tudatosítani kell, hogy az új telepítési szőlők teljesen mentesek mindenféle beadás alól. 2) A község villamosításához szükséges faanyag kitermelésének, szállításának, a tartóoszlop beállításához szükséges gödrök kiásásának biztosítására minden igaerővel rendelkező köteles két nap fuvar, igaerővel nem rendelkező család pedig kézimunkát teljesíteni.”⁴⁵ Az első határozat azt jelenti, hogy az ötvenes évek elején Erdőbényén már volt egy termelészövetkezet. Tehát nemcsak a fenti begyűjtésre kötelezett családok éltek a mezőgazdaságból, hanem azok is, akik ebben a termelészövetkezetben dolgoztak. A második határozat pedig arról tanúskodik, hogy Erdőbénye villamosítását 1954-ben kezdték el.

⁴² Ezen felül volt néhány gazda, akiről szintén készült begyűjtési irat, de utólag ráírták az iratokra, hogy „begyűjtésre nem kötelezett”. Valamennyiüknek a földjük még a fél holdat sem érte el. Kiemelendő azonban, hogy nem minden fél hold alattival voltak ilyen kegyesek.

⁴³ 1 katasztrális hold = 0,57 ha, vagy 1600 négyszögöl, illetve 5755 négyzetméter.

⁴⁴ BAZVM. Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek. 1. kötet. 1952. július 13-i ülés.

⁴⁵ BAZVM Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek. 1. kötet. 1954. január 14-ülés.

2 táblázat: Erdőbénye birtokszerkezete a beszolgáltatási adatok alapján 1952–1953 gazdasági években

Table 2: Structure of Erdőbénye's landholdings according to contemporary tax register data for the economic years 1952-1953

| | Földterület (kh) | | | | | | | | | | | | | |
|--------------|------------------|----|----|----|----|---|----|---|---|----|----|-------|-------|-------|
| | < 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12–14 | 15–21 | Össz. |
| gazdák száma | 66 | 31 | 24 | 17 | 11 | 2 | 21 | 2 | 7 | 1 | 7 | 7 | 4 | 235 |

Forrás: B.-A.-Z.m.l.t XXIV. 888. Az erdőbényei községi begyűjtési megbízott iratai 1952–1953. év alapján saját szerkesztés.

A tanácsi ülésekre a vezetőségen felül 1952-ben 81 tanácsstag is meghívót kapott. A januári ülésen a nagyszámú tanácsstagok közül 9 kivételével, még mindenki megjelent, ahol a gazdaságukra vonatkozó fontos kérdéseket tettek fel. A jegyzőkönyvekben szereplők közül, íme néhány kérdés: „Szikszei István tanácsstag rámutat, hogy az erdőbényei község legelőterületéből az állami erdőbirtokosság 70 kh területet igénybe vett, ilyen körülmények között, hogyan képzelhető el az állattenyésztés fejlesztése? [...] Kerekes Ferenc felszólal, hogy sok gazdának a lucernamagja még mindig csépeletlenül van, mert a gépállomás nem hajlandó lecsépelni, miért nem kötelezik erre, mikor annak idején a magán cséplőket tudták kötelezni... Az állattenyésztés fejlesztése érdekében biztosítson a kormányzat hatósági áron korpát [...] a szőlőtelepítéshez a karó miképpen lesz biztosítva?” 1954 közepén már csak 47 tanácsstag jelent meg, ahol a járási begyűjtési hivatal vezetője is jelen volt és éles kritikával ostromozta az erdőbényeieket a szerinte elégtelen beszolgáltatási eredmények miatt. Ezután már póttagokkal pótolták a hiányzó tanácsstagokat, és határozatba foglalták, hogy a tanácsstagok igazolatlanul nem mulaszthatnak, nekik kötelességük a tanácsülésen megjelenni.⁴⁶ Az emberek érdeklődését azonban nem lehetett erőszakkal fenntartani, amire a válasz a tanácsstagok számának drasztikus csökkentése lett. Akik maradtak, azok már nem tettek fel semmilyen kérdést és mindent megszavaztak. Eközben a tanácselnökök személye is gyakran cserélődött.

Az 1956-os forradalom ebben a faluban is lezajlott, de az országos eseményekhez képest minden megkéssve történt. A helyi forradalmi eseményekről Kis József 2006-ban részletesen beszámolt,⁴⁷ amit az alábbiakban rövidítve összegezek: Október 26-án este Kántor István földműves hangos híradón keresztül hívta a lakosságot felvonulásra, ami nem szokványos módon zajlott, mert a helyi párt- és tanácsi vezetők, amennyiben nem jelentek meg a tömegben, a felvonulók a lakásukra mentek és felszólították őket a csatlakozásra, majd nemzeti színű zászlót nyomtak a kezükbe és a tömeg élére állították. A tüntetők jelszavakat kiabáltak és összetörték a rendőri megbízott irodájának falán lévő népköztársaság címert és a tanácsháza falán lévő szégyentáblát. A tanácselnöktől, majd Huszár István pénzügyi előadótól is kérték a tanácsháza kulcsát, ők azonban nem tudták odaadni. Ekkor betörték az ajtót, majd a begyűjtési iratokat kidobálták az ablakon. Az iratokat az udvarban meggyújtották és elégették. Közben a tanácsházán Huszár István ellen fordult a hangulat, ki akarták dobni az ablakon, de Király József kőfaragó utasítására elengedték, sőt Király és Sturmman Helén haza is kísérték a megrémült előadót, hogy semmiképpen ne essék bántódása. Már-már majdnem szétszéledtek, amikor éjfél körül hangos híradó hívta őket a tanácsházára, hogy meg válasszák a községi munkástanácsot. A 8 tagú munkástanács testületének elnöke Király József lett, akinek fontos szerepe volt a további helyi rendbontások megakadályozásában is. Létrejött a nemzetőrség. November 4-e után a község élén a munkástanács vezetői maradtak, sőt november 11-én átalakultak Forradalmi Munkás-Paraszt Tanácsná, mintha még nem vették volna észre, hogy a szovjet csapatok már bent vannak országban

⁴⁶ BAZVM. Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek. 1. kötet. 1953. február 8-i üléséről.

⁴⁷ Kis J. 2006: Erdőbénye. In Borsod-Abaúj-Zemplén megye 1956. Sátoraljaúj helyi és Szerencsi járás, 158–163.

és leverték a forradalmat. December 10-i kormányrendelet azonban feloszlatta a területi munkástanácsokat így az erdőbényei is megszűnt. December 18-án újjáalakult az Erdőbénye községi tanács végrehajtó bizottsága. Ennek során távozásra kényszerítették a régi vezetőket. A volt Forradalmi Munkás-Paraszt Tanács egyes vezetőit azonban beválasztottak az új 9 fős testületbe, annak élére pedig Király Józsefet választották meg. A felruházott hatalommal azonban csak egy hétig élhettek. Előbb a házkutatások, majd a megtorlások, illetve a letartóztatások, a disszidálások és a bebörtönzések következtek Erdőbényén. A régi tanácsi és pártvezetők pedig visszatérhettek a forradalom előtti pozícióikba.

A forradalom után 1957. április 30-án ült össze először a községi tanács, ahol két napirendi pont volt. Az első a község helyzete az ellenforradalmi eseményektől napjainkig, a második pedig az, hogy kik akarták átvenni a hatalmat? Az előadó Vacher László mb. vb-elnök volt.⁴⁸

1958–1962 az országos tendenciáknak megfelelően Erdőbényén is megalakult a helyi községfejlesztési bizottság, amely először a közműfejlesztéssel foglalkozott. Ez egy jogos feladat volt, de a fejlesztéseket még mindig nagyrészt a helyi lakosság „önkéntes munka” felajánlásával próbálták megoldani. Erre, íme egy példa „Nagyon fontos feladata van a bizottságnak, hogy a hídépítéshez az anyag beszállításra kerüljön, ezért szükséges, hogy a lófogatokat beszervezzük társadalmi munkára, hogy az anyag mielőbb bekerüljön [...] A lakosság kérelme, hogy az utcai égők számát növeljük, mert sok helyen, ahol nagy a sár, sötétben nem lehet közlekedni mert nincs égő. Tíz égővel növeljük a megvilágítást, de ez nem elég.”⁴⁹ Később több területen is állandó községfejlesztési bizottságokat hoztak létre: a művelődés, a mezőgazdaság, az ipar és kereskedelem, a gyerek- és ifjúságvédelem. A jegyzőkönyvek alapján jelentős mértékben foglalkoztak azzal, hogy a cigánygyerekek közül a szülők sokat nem íratnak be az iskolába, vagy nem járnak rendszeresen iskolába és nincs megfelelő ruhájuk.

A kollektivizált mezőgazdaság korszaka

Országszerte az 1958–1961-es évek falun a parasztgazdaságok megszüntetése és a kollektív gazdaságok létrehozása jegyében telt el. Az erdőbényei tanácsi jegyzőkönyvek nem szólnak arról, hogy a mezőgazdasági bizottság erről a kérdésről is tárgyalt volna. Ezt a feladatot abban a korban ott is bizonyára csak a pártszervezetben tárgyalták meg. A korszakról egy visszaemlékező a következőképpen vallott: „*Tehát a Lenin Kohászati Művekből jöttek az agitátorok. Ha szépen, ha csúnyán, azok az emlékek megvannak. Nagyon sok olyan emberrel volt alkalmam találkozni, akik nagyon csúnyán összetörték. Volt olyan itt a környékünkön, aki meghalt [...] végül itt megalakult az Erdőbénye Kossuth Szakszövetkezet*”. A szakszövetkezetek nagyobb szabadságot adtak a tagoknak, mint a termelőszövetkezetek. Különösen igaz ez az olyan kisparcellás szőlővidékre, amilyen Erdőbénye volt. „*Itt nem volt háztáji senkinek, hanem mindenki megtarthatta a saját földjét [...] akkor még sok jószág volt a faluban, volt szarvasmarha, volt juh, volt nagyon sok ló, fuvaros [...] aztán lassan a '80-as években ez elkopott.*” A közös gazdasághoz csupán pár száz hektár szántó, szőlő, erdő és a juhászat tartozott, a többi magánművelésben maradt. A szakszövetkezet jövedelme kisebb arányban származott a mezőgazdaságból, mint az úgynevezett melléküzemágakból. Az Erdőbénye Kossuth Szakszövetkezetben a következő melléküzemágak voltak: esztergályos-, lakatos-, asztalos-, kádár-, kőfaragó-, takarítóüzem, varroda. „*Mindent csináltunk a fatalpú cipőtől kezdve a hordóig, virágdezsáig, [...] 1983-tól megszűnt az érc- és ásványbányánk és akkor átadták a vagyonállományt a szakszövetkezetnek [...] Budapesten, Balatonfüzfőn, Pécsen, Miskolcon is volt melléküzemágunk.*”⁵⁰ A melléküzemágakban dolgozókat is beléptették tagnak, így gyakorlatilag többen voltak a nem helyben lakók, mint a helyben lakók. Ez a rendszer nemcsak Erdőbényén, hanem sok más helyen is a kölcsönös előnyök és kényszerek nyomására alakult ki. Az 1970-es években az erdőbényei szakszövetkezethez csatolták két másik település (Baskó és Komlóska) szövetkezeteit is. Ez azt jelenti, hogy az Erdőbénye Kossuth

⁴⁸ BAZVM. Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek 2. kötet. 1957. április 30-ai ülés.

⁴⁹ BAZVM. Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek 3. kötet. 1962. január 12-i ülés.

⁵⁰ Ezek a városban lévő „melléküzemágak” külön elszámolási egységek voltak.

Szakszövetkezet az adott körülmények között egy jól jövedelmező és szerteágazó tevékenységeket végző gazdaság volt. Az 1970–1980-as években legalább ilyen jól jövedelmező második gazdaságot is kialakítottak az erdőbényeiek. Erről egyik helyi lakos így beszélt: *„Tehát mindenkinek volt egy darab szőlője, mellette volt egy kis egy sáv, ahol volt egy pár gyümölcsfája. Rengeteg szilva volt, alma volt, körte volt. És akkor ebből főzték a pálinkát. Sárospatakon volt a központ, oda tartozott az itteni pálinkafőző”* Az 1970-es évek közepéről egy másik visszaemlékező így beszélt: *„elhagyott parlag területet megvettem. Először egyet, kettőt, úgyhogy három darabban csináltam, az lett összesen egy hektár. [...] Akkor még lehetett felvenni 1,5%-os kamat mellett telepítési kölcsönt, abból telepítettem. [...] Aztán meg a borkombinát adott termelési előleget, igen. Aztán garantáltan megvásárolták a mustot [...] A rendszerváltás előtt volt olyan 2 hektár szőlőm, de kutyasokat dolgoztam, mert akkor még nem volt olyan technológiai háttér, mint ma. [...] Mindenki, akinek nem volt esetleg saját szőlője, mert fiatal volt, például akik a bányában dolgoztak, letudták reggel 6-tól 2-ig a műszakot, délután még estig olyan szépen meg tudott egy jó napszámot keresni, vagyis nem napszámban dolgoztak, hanem felvállaltak egy darab szőlőt, hogy azt ennyiért bekapálják. Tehát azt mondta, ezt a fél holdat 5 ezer forintért szoktuk bekapálni. Akkor 5 ezer forint⁵¹ nagyon sok pénz volt”*. Visszaemlékezéseikben többen úgy vélik, hogy a falubelieknek a szocializmusban több szempontból is jól ment a dolguk: *„A ’70-es években már nem földutak, hanem aszfaltozott utak lettek, sajnos a macskaköves utak nagy részét is leaszfaltozták. Az emberek közül nagyon sokan dolgoztak a bányában, az üdülőben, a helyi tsz-ben. Tartottak állatokat, a földművelés, azon belül is a szőlőművelés volt jellemző foglalatossága a falubelieknek”*.

A szocializmusban hiánygazdaság volt, mindent el lehetett adni, amit megtermeltek az országban. Különösen vonatkozik ez az italra. A bort, pálinkát elsősorban a Szovjetunióba szállították és adták el.

A hiánygazdaság és az, hogy még éltek a parasztként szocializálódott gazdálkodási hajlammal bíró családtagok, elősegítette a ház körül, a saját udvarban és földön végzett gazdaság részleges fennmaradását. Közvetlenül a szakszövetkezet megalakulása után ilyen módon állították elő a legtöbb élelmiszert. Így ez volt a legfontosabb megélhetési forrás, azonban – mint már az előbbiekben szó volt róla – az 1980-as években, ahogy kiöregedtek a szakszövetkezetbe belépők és ezzel párhuzamosan nőtt a szőlő, illetve a bor és pálinka felvevő piaca, úgy csökkent a nagyállattartás, de a családi önellátására fenntartott sertés- és baromfitartás a rendszer végéig jellemzően fennmaradt. Ugyanez vonatkozik a zöldség- és gyümölcs termesztésre is. Ezzel az élelmiszerre fordított kiadásait jelentősen tudták csökkenteni.

A visszaemlékezéseket elemezve arra a következtetésre jutottam, hogy, míg az erdőbényeiek a szocializmus első – Rákosi-féle – korszakához nem, addig a második – Kádár-féle – korszakában, annak kezdeti éveit leszámítva, az 1970–1980-as években megtanultak alkalmazkodni és megtalálni számukra a rendszerben a jó helyüket.

A rendszerváltás utáni korszak

Ez a korszak is két részre osztható. Az első rész a rendszerváltástól a 2014. évi Bor mámor Bénye Fesztivál megtartása és e fesztivál fogadtatásának bemutatásáig tart.⁵² Majd ezután következik a második időszak, amely egészen napjainkig tart, és amelyet a vidéki dzsentifikáció megközelítéséből mutatom be és Erdőbényét helyenként összehasonlítom más dzsentifikált településsel. A „vidéki dzsentifikáció szakkifejezés az angol rural gentrification tükörfordításaként született. Vidék alatt a nagyvárosoktól távoli vidékies területeket értjük, nem pedig a „nem budapesti” vidéki térséget, míg dzsentriként az angol eredeti tartalmát alapul véve a feltörekvő középosztályi rétegekre és nem a lecsúszó nemességre utalunk” (Tomay–Völgyi 2022,

⁵¹ Egy egyetemi docens havi fizetése 5000 forint körül volt.

⁵² Erről bővebben lásd Kovács–Bodnár 2016.

66.) „A dzsentrifikáció szinte elkerülhetetlen hozadéka a két eltérő életmódú és értékrendű csoport egymás közötti konfliktusa”. (Tomay – Völgyi 2022, 71.)

A rendszerváltás lebonyolítását a falu lakossága kizárólag negatív jelzővel illette: „*Mire kifizette a falu a hitelt (az iskola felépítésére gondol) addigra itt a nagy rombolás eredményeként olyan szinten lecsökkent a gyerekszám, hogy nincs kit felnevelni.*” „*A borkombinát is összeomlott, és szétszedték a területeket, összesen pár tíz hektárnyi terület maradt, és megszűnt a felvásárlás, a szőlő nem kellett a kutyának se, és akkor jöttek az alföldiek az aranyháromszögből ide szőlőt venni bagó pénzért.*” A borkombinát – amelynek helyben is volt foglalkoztató részlege – mellett privatizálták a két legnagyobb foglalkoztatót, a szakszövetkezetet és Magyarország egyetlen – 1937 óta működő – kovaföld bányáját. A bánya korábbi igazgatója erről így vélekedett: „*Mikor még mi voltunk, 107 fő volt, de most már ilyen 6-7 fő van. [...] Még '89-ben privatizáltuk a céget, és úgy nem éreztem azt, hogy nekem ott van perspektívám. Tehát abból volt egy vegetálási szint egy fizetésecske, de az is nehézkesen jött már a végé fele. Többször csődbe lett víve, kihozva a csődből, és akkor így kellett egy egzisztencia [...] Még '87-ben vettem egy szőlőt, és akkor utána még többet, mert olcsó volt, az emberek szabadultak volna tőle, majdnem ingyen volt. [...] 8 hektárom van most, amin dolgozunk, meg 7 hektár, amivel majd lesz valami, mert nincs benne most még szőlő.*” A volt bányai igazgató Erdőbénye legforgalmasabb helyén vett 2003-ban egy hatalmas pincét, afelett lévő épületből kialakított egy termelői borkimérésre és fix körös borkóstolásra alkalmas helyiséget. Bár Bodrogkeresztúron lakik, de Erdőbényén ma ő az egyetlen olyan borász, aki egész éven át nyitva tart egy a bor-, must- és kávéfogyasztásra alkalmas pincét. A szocializmus vége felé Erdőbényén felépült az új iskola, az Antall-kormány alatt pedig a tornaterem. Számítástechnikai, könyvtári ellátottság szempontjából nagyon jól felszerelt és jó tanárokkal bíró iskola volt. Az átadásakor az iskola még teljes kihasználtsággal működött, és volt, hogy párhuzamos osztályok is voltak azonos évfolyamon. A gyereklétszám azonban csökkent. A falut, főleg az érintett pedagógusokat és szülőket sokként érintette, hogy az iskola 2008 szeptemberétől önállóságát elveszítette, és azóta a bodrogkeresztúri Eötvös József Általános Iskola Erdőbényei Szent István Általános Iskola Telephely néven működik hat osztállyal. Ehhez hasonló szervezeti egységként működik az óvoda is. Az iskola hat osztályába a 2022/2023-as tanévben 32 gyerek járt. A hetedik–nyolcadikosok naponta busszal járnak Bodrogkeresztúrra az általános iskolába. A szükséges tanerőt úgy oldották meg, hogy a tanárokat utaztatják a két település között. Ha „*nincs, iskola akkor meghal a falu*”, hangzott el az egyik helyi kulcsszereplőtől.

Sokan munkanélküliek lettek, a fiatalok mentek a városba, vagy külföldre. A lakosság drasztikusan csökken (*1. ábra*) és akik maradnak azok között is egyre több az idős személy. A helyiek a fő problémának a munkahelyek hiányát látják. A megoldást pedig a polgármester 2015-ben még egy nagybefektető megjelenésében remélte, de hosszú ideig csak a közmunka hozott enyhe javulást.

Nemcsak a munkahelyek szűntek meg, hanem a házkörüli önellátást szolgáló termelést is csak esetleg a munkaképes idősebb generáció egyes tagjai folytatják: „*Férjem már nyugdíjas, itthon gazdálkodik. Van egy nagy konyhakertünk, egy kis szőlőnk, tartunk állatokat: malacot, tyúkokat. Mindig is arra törekedtünk, hogy megtermeljük azt, amire a családuknak szüksége van, amennyire csak lehetséges önellátóak legyünk, minél kevesebbet kelljen boltból vásárolnunk élelmiszert.*” Az önellátásra való termelés megszűnése összefügg a generációváltással is: „*Hát sokan nem tartanak már háziállatot, amit eddig tartottunk. Ha például azt vesszük, hogy nekünk gyerekkorunkban volt általában két malackánk, nem tudom én, hány tyúk, pulyka, kacsa, minden ilyesmi... Anyáéknak hatalmas nagy kertjük volt, és ők ültettek kukoricát, lucernát, mindent, meg hát ugye vették is a tápot nekik [...] hosszú parasztházunk volt, a gang előtt szőlőtöke felfuttatva. A szemben lévő oldalon volt 1,20 m szélességben egy ilyen kis fakerítéssel elkerítve kis kert, benne paradicsom, paprika, ami hirtelen kell kézhez [...] A kertet már nem csinálom. Az első két évet csináltam, de megmondom őszintén, az időjárás mindig... elverte a jég, vagy valami problémája lett... sziklakert lett a helyén, igen, de tele vagyunk dísznövényekkel, tujákkal, sövényvel [...]. Csak egy cicám van...*”

Egyre több lett az üresen álló ház. Ezért a házak olcsók lettek és jellemzővé vált, hogy debreceni, nyíregyházi és budapesti értelmiségiek (orvosok, tanárok) is vásároltak üresen álló esetleg leromlott házakat, azokat felújították és hétvégi háznak használták. Tehát csupán néhány hétvégén, meg nyáron tartózkodtak benne. A falubeliek szemében ők lettek a vikendesek. Ez a tendencia ma is folytatódik; az ország minden tájáról, sőt Szlovákiából és Lengyelországból is jönnek második otthonát vásárolni.

Nagy változást hozott az, hogy a 2000-es évek elejétől, közepétől Erdőbényén megjelentek a dzsentrifikánsok is. Tehát középosztálybeli – értelmiségi/vagy anyagilag kiemelkedően jól szituált, vállalkozószellemű, gyakran külföldi munkatapasztalatokat szerzett budapesti, egyéb nagyvárosi, esetleg Balaton környéki fiatal, de inkább középkorú személyek, akik először szőlőterületeket, majd házat is – alatta pincével – vásároltak, vagyis komolyabb befektetéseket eszközöltek Erdőbényén. Motivációik oka az volt, hogy, mivel Erdőbénye egy gyönyörű természeti környezetben, csendes, a világtól elzárt falu, ráadásul olcsók az ingatlanok, ezért most itt fognak bele a szőlészetbe-borászatba, amire ráadásul a térség agroökológiai adottságai is kiválóak. Azonban Szőlőszemmel ellentétben (Tomay–Völgyi 2022), jellemzően nem költöztek be a faluba, hanem, legalábbis egy darabig maradtak a fővárosban, esetleg Sárospatakon telepedtek le és onnét irányították a gazdaságukat, de gyakran tartózkodtak az erdőbényei birtokukon (szőlőikben, házaikban). Ők hozták létre a Bor, mámor, Bénye Egyesületet, majd megszervezték az azonos nevű fesztiválokat. A kezdetekről az Egyesület első elnöke így beszélt: *„Az ötlet az úgy jött, hogy 2007, 2008, 2009 környékén volt már öt-hat olyan hasonló borászat, tehát máshonnan idetelepült, és elkezdett itt ilyen kis, ma Magyarországon kézművesnek mondott borászati tevékenységet folytatni, és valamikor csináltunk egy megbeszélést, ez 2009 tavaszán volt, hogy meg kéne mozgatni a falut is, meg egyáltalán a falunak csinálni valami hírverést, mert hiába vagyunk itt, gyakorlatilag turista nem jön erre, meg semmi nem történik a faluval, és senki nem tudja, hogy hol van Erdőbénye, és hogy csináljunk egy fesztivált. Akkor ebben azt hiszem, hogy hat borászat vett részt, akkor ennyi is volt körülbelül a faluban. Ezt inkább úgy lehet elképzelni, mintha párhuzamosan szerveztünk volna hat ilyen házibulit. Tehát nagyon kevés, a szó eredeti értelmében vett program volt. Talán lehetett öt-hat ilyen kis kiállítás, itt zenél valami DJ, ott csak a tulajok csináltak valami zenét, a harmadik helyen arcfestést csináltak a gyerekeknek. Ez valóban egy nagyon jó hangulatú, minimál költségvetésű rendezvény volt. Az emberek sétálgattak, megvettek egy pohár bort és azt kóstolgatták. A következő évben egy kicsivel többen jöttek, azután volt egy nagy hanyatlás, mert a látogatók száma lecsökkent”. Választóvonalat jelentett a 2014-es immár hatodik Bor, mámor, Bénye Fesztivál, amely három napig tartott és e három nap alatt Erdőbényén megfordult hármezer ember. Ekkora az Egyesület tagjainak a száma 2009-hez képest már megduplázódott. Az, hogy kiket vártak a fesztiválra az elnök a következőképpen határozta meg: *„Mi 18 és 45 közötti, kultúrára, borokra költő, jólszituált pesti, debreceni réteget próbálunk megcélozni. Tehát aki szereti a kultúrát és tud is rá költeni”* A fesztivál idejére két utcában műanyagszalagot húztak ki, néhány helyen rácsot is felállítottak a forgalomelterelésé céljából. Ez a helyiek szemében úgy csapódott le, hogy lezárták az utakat. Felállítottak a rendezvény határán több információs pultot, ahol a fesztiválmunkások a belépőjegyek megfizetése után karszalaggal és programfüzettel szolgálják ki a fesztiválra érkező látogatókat. Az öslakosok ingyen kaptak karszalagot, amit kizárólag személyesen és személyi igazolvánnyal vehettek át. Az, hogy hogyan fogadták a helyi lakosok a 2014-es Bor, mámor, Bénye Fesztivált egyik öslakos így foglalta össze: *„A legelső alkalommal amikor az interneten olvastam, hogy célközönség a havi 250 és 500 ezer forint között kereső, 35 és 45 év közötti gyerekes családok – és ez így le volt írva – nem gondoltam, hogy két hónap múlva megjelenik itt 3000 ember. [...] Ehhez a falu, csak díszletként kellett.”* Összegzésként megállapítható, hogy a Bor, mámor, Bénye fesztiválszervezőinek szempontjából a fesztivál sikerét mutatta, hogy a település hírnévre tett szert, az ingatlanok árai emelkedtek, és ezáltal a falu „megmentőinek” érezték magukat, míg a településvezetés és a helyiek úgy élték meg a helyzetet, hogy ők kiszorultak a fesztivál szervezéséből, és a remélt munkalehetőség helyett „díszletként” használta a fesztivál a falut. A helyi megélt és a turisztikai valóságok szétváltak és összeütköztek (Nemes–Orbán–Tomay 2022,*

107), de nem vezettek a területi, emberi, kulturális erőforrások erőzójához, mint ahogy az Balaton-felsőn megtörtént.

Közeledés a helyiek és a dzsentifikánsok között Erdőbénye jövőbeni fejlődési irányának meghatározásában

A fesztivál szervezőinek és a település vezetésének, lakosainak szétartó érdekei és elvárásai oda vezettek, hogy a Bor, mámor, Bénye Egyesület vezetésében 2017-ben változás állt be. Az új elnök – aki egy értelmiségi-nagyvállalkozó családból származott – gyerekkorára óta kötődik Erdőbényéhez. Ebbe a faluba, ahogy maga is mondta, 1996-ban tette be először a lábát, amikor a szülei megvettek egy leromlott kúriát, majd azt felújították. A felújítás tíz éven keresztül tartott, de végül nagyon szép eredeti állapotban visszaállított kúria lett belőle a falu szélén, ráadásul az egy pompás természeti környezetben áll. Közben megjárta Amerikát és Németországot. Debrecenben beiratkozott a jogi egyetemre, de azt nem fejezte be, hanem 2010-ben elkezdett Erdőbényén – szőlészeten-borászatban és építkezésben – dolgozni. Három-négy évig még nem költözött be a faluba, de gyakorlatilag hétfőtől szombatig ott volt. Majd 2013–2014-ben eladták a debreceni lakásukat és a feleségével végleg Erdőbényére költöztek.

„A birtokközpont, az maga ez a komplexum itt, ez a három telek egyben. A kúria az igazából reprezentációs célokat szolgál. A felső szint az privát, oda édesanyámék, ha jönnek, akkor ők ott vannak, ott laknak. De egyébként ők Debrecenben élnek, tehát ez ilyen hétfégi háznak megmaradt nekik. Ugye itt van a borkóstoló helyiség, kint beindítottunk most már harmadik éve egy éttermet. Tehát szezonálisan van nyitva az étterem, hétfőig csütörtöktől vasárnapig, attól függően, hogy a szezon hogyan alakul. A szomszédban megépítettük most a borászatot. Az is egy ilyen hároméves projekt volt körülbelül a befejezésig. Addig elég mostoha körülmények között készítettük a bort. A technológiánk az már régen megvan, csak maga ugye az épület az nem volt normálisan megcsinálva, hát mondhatnám egy romépületben csináltuk eddig. Minden, amit itt tetszik látni, azt jóformán két kézzel csináltuk meg. [...] átlagosan 5 ezer palackot termelünk évente.” Hat, hét alkalmazottja van, de olyanokat vett fel, akik több mindenhez is értenek. *„A szakácsom is most szezonban szakácskodik, szezonon kívül meg jön velünk ki metszeni, vagy akár bort fejteni tehát, hogy nálunk mindenki csinál mindent [...] eleve így is veszem fel az embereket. A szakácsom az Pest mellől jött, ő ide költözött direkt a munka miatt. [...] tehát hét közben például júliusig nem volt felszolgáló, tehát én voltam a felszolgáló, csináltuk a hétköznapi normális munkát, vagy hogy mondjam, tehát a borászathoz-szőlészethez tartozó munkát, pénteken akkor meg felszolgálóskodtam vasárnapig. [...] Nekem a célom az lenne, hogy a befektetéseimből mások is megéljenek, tehát az alkalmazottjaim. Nekem ez nagyon fontos. Tulajdonképpen az én sikereimet nyilván a borban is mérem, meg azok által elért sikerekben, de legfőképpen nekem a sikereim mérése az, hogy én hány embert tudok eltartani, mint vállalkozó.”*

2022-ben a Bor, mámor, Bénye Egyesületnek 15 borász tagja volt, és mint arról szó esett, az Egyesület 2017-ben a fentiekben bemutatott borászt választotta meg elnöknek. Az, hogy miért került sor az elnökváltásra, az előbbi és az utóbbi elnököt is megkérdeztük 2022-ben. Az előbbi azt mondta, hogy nem tudja miért nem őt választották meg, az utóbbi szerint a fesztivál jövőjének az iránya körül alakult ki vita és az előző elnök változatlanul grandiózus fesztiválok megtartása mellett érvelt és elképzelésével végül egyedül maradt. A jelenlegi elnök stratégiája két fontos pont köré csoportosul:

Az egyik pont arra vonatkozik, hogy milyen fesztivált szeretnének a jövőben? *„Igazából egy kis családi fesztivált szeretnénk csinálni. Nekünk nem az kell, hogy ide 50 millióért jöjjenek fellépők. Mi nem ötezer embert akarunk, nekünk kétezer ember a maximum, amit itt úgy be tudunk fogadni, hogy itt az emberek kényelmesen, nyugodtan tudjanak a fűben üldögélni, ne az, hogy egymás hegyn, hátán legyenek. És mi ebből nem akarunk kinőni. Mi ezt a fesztiválmoddell, ezt akarjuk tökélyre fejleszteni. Elsősorban anyagilag. Az a legfontosabb tehát, hogy ne az legyen, hogy nekünk minden szezon végén úgy kelljen remegni, hogy vajon megjön-e a tízmillió forint támogatás, vagy az ötmillió forint, mert különben csődbe megyünk, vagy mi kifizetjük. Hanem azt*

akarjuk, hogy gyakorlatilag egy önfenntartó fesztivál legyen, ha egy fillértámogatást nem kapunk, akkor is.” Ez a stratégiája valahol az induláskori, a 2014-es első fesztivál, amit még a borászok és a falu együtt szerveztek, és a 2014-es – anyagi szempontból és a látogatók számát tekintve is nagyszabású fesztivál között van. A stratégiának másik pontja, hogy milyen legyen a kapcsolat a faluval? „Az előző vezetése ennek a Bor, mámor, Bénye Egyesületnek nagyon rossz viszonyban volt a faluval. És nekem ugye ez volt az egyik fő feladatom, hogy rendbe rakni ezt a viszonyt, és most már odáig jutottunk, hogy kooperálunk is, egymást húzzuk fel a színvonalra. Akár egy Aszú fesztiválon mi is most már ott vagyunk [...] most már ugye hozzuk be ide kívülről, hogy egyáltalán, hogy kell kinézni egy bulinak, mi a gasztronómia, és most már ők is látják, ők is megkóstolják, és most már tehát megfogalmazódott ez a helyiek részéről is igen.”

Az tény, hogy a dzsentrifikánsok, a városi felső középosztálybeli borászai házakat vásároltak és azokat felújították, az a faluban mindenkinek tetszik, örülnek annak, hogy Erdőbényén már nincs sok romos, gazdátlan ház.

Arra a kérdésre, hogy mit kellene megváltoztatni a faluban az egyik kulcsszereplő így válaszolt: „*munkahelyeket létesíteni. Üzem, gyártósor jó lenne, ide költöznének emberek, vagy átképeznék őket, hoznák a családot, fiatalodna a település*”. A helyi vezetés viszont elmozdult egy modellváltás irányába. 2022-re az önkormányzat két egykori szolgálati lakását felújította és vendégházként hasznosítja. Erdőbényén az egyéb beruházások is a turizmus irányába mutatnak. A helyiek közül is páran vettek, vagy örökölték házat és azt ők is panziókká alakították át. Erdőbényén 41 vendégház van.⁵³ A tulajdonosok közül 11-en a helyi lakosok és további négyen vannak azok a dzsentrifikánsok, akik már életvitel szerűen Erdőbényén élnek. A többi dzsentrifikánssra viszont ez nem jellemző, mert továbbra is Budapesten, vagy egy másik városban laknak. Ezek a vendégházak változóan 5-40 fő elszállásolására alkalmasak, de leggyakoribbak 10-20 fősek. Két okból kifolyólag jött létre ilyen sok vendégház: Egyrészt, azért, mert házfelújításra nem, de szálláshelykialakításra lehetett támogatást felvenni, másrészt, akik nem helyiek, de úgy döntenek, hogy vendégházat alakítanak ki Erdőbényén azoknak a táj szépsége és a falu hangulata olyan vonzó volt, hogy ebből egy szezont szeretnének magukénak tudni. A tulajdonosoknak a vendégfogadásból származó bevételeik minden esetben csak az egyik, de jellemzően nem a legfőbb bevételi forrásuk. A dzsentrifikánsokat a faluközösséghez való viszonyulásuk alapján megkísérlek három csoportot besorolni: Az egyik csoportba azok tartoznak akik az évi egy fesztivált leszámítva, kizárólag csak üzleti tevékenységük révén kötődnek Erdőbényéhez; a másik csoport tagjai a szőlő, a borászat és a vendégház révén, gyakrabban jönnek Erdőbényére és már több szálon kötődnek a faluközösséghez, mint az előbbieket, a harmadik csoport pedig azok (a budapesti informatikus, történész, marketinges, futball manager) tartoznak akiknek a borászat, vagy a panzió inkább hobbit jelent és ők, különösen a covid járvány után, már többet tartózkodnak a faluban, mint korábban és egyre több kapcsolatot építenek a faluközösséggel, mert nekik Erdőbénye az életük zajosabb oldalától való elfordulás és az egészséges élet terepe.

Következtetések

Tanulmányomban, mai távlatból nézve, Erdőbénye 15. századtól napjainkig terjedő szociológiai és regionális szempontú településtörténeti elemzésére vállalkoztam. Ebben a hosszú időtávban három dolog mindig jelen volt, az első a szőlő- és a bortermelés és a borértékesítés. A második a 19. század második felében a bányászat megjelenése. A harmadik dolog pedig az volt, hogy ezeket a gazdasági ágazatokat mindig idegenek indították el és ezek további betelepülést gerjesztettek. Az viszont, hogy egyes korokban kik és milyen körülmények között tudtak abból megélni az évszázadok során változott.

Erdőbénye csak a 16. század derekán – a hegyaljai településcsoport részeként – vált Európa-szerte ismert és magas minőségű borvidékké, majd erre kiépült egy piacképes árucseré-forgalom – mai

⁵³ A helyi jegyző az 239/2009 Korm. rendelet alapján (2023.05.24-ig) kiadott szálláshely-engedély adatai szerint.

szóval élve marketing –, ami a lengyel piacok megszerzésében ért a csúcsra. A szőlők nem tartoztak a jobbágyteleki állományhoz, vagyis a szőlőterületek és a bor szabad adásvétel tárgyát képezték, de ennek a lehetőségnek a kihasználása nem a helyieknek – akiknek csak napszámos munkák akadtak –, hanem a külbirtokosoknak, és azok közül is a felvidéki szabad királyi és a szepesi városoknak, de különösen Lőcse városának adatott meg a legnagyobb mértékben. A 16. század derekán Erdőbényén és az olaszliszkai határban Lőcse egymás után vásárolt szőlőket, és a legnagyobb birtokos lett a település határában, a belterületen háza és pincéje is volt.

Erdőbényét története során több olyan csapás is érte – tűzvész és járványok –, amelyek a lakosságának jelentős részét elpusztították, de a természeti csapások sem kímélték őket. 1885-ben a filoxéra járvány elérte a Hegyalját is, aminek következtében néhány év alatt kipusztult a szőlőterületek közel 90%-a. A borgazdaság összeomlása munkanélküliséghez és elszegényedéshez vezetett az egész Hegyalján, de 1907-re az 1870-es szőlőterületeknek már 62%-án díszlett újra a szőlő. Erre a korra esik az izraeli lakosság megjelenése a 19. század végén. Nedűkhöz kötődik a kőbányászat felvirágoztatása és kőfaragó mesterség meghonosodása. A dinamikus növekvő kőbánya külföldiek tucatját: olasz, osztrák származású szakembereket vonzott a településre. A különösebb szakértelmet nem igénylő munkafázisokat, azaz magát a kőfejtést helyi lakosok végezték. Felépültek a szép kőházak, amelyek alá pincék kerültek és a falu gyarapodott. A két világháború között megnyitották a kovaföld bányát is, ami a szőlő és bortermelés mellett további munkahelyek létesítését jelentette az ott élők számára. Mára azonban a helyi bányászat megszűnt.

1945-ben Erdőbényén is volt földosztás és megalakult egy szövetkezet. 1954-ben kezdődött el a falu villamosítása, aminek kivitelezésében kötelező volt a helyieknek is fogatos kocsival, vagy gyalogmunkával részt venni. A Rákosi-korban a beszolgáltatási kötelezettségek irreálisan magasak voltak és akkori Erdőbénye egy szegényparaszti gazdátársadalom képét mutatta. Talán a legnagyobb csapást a helyi parasztságra mégis az 1961-es kollektivizálás mérte, hiszen az 1960-as évben vándoroltak el legtöbben a faluból (Kovács–Bognár 2016, 35), pedig szakszövetkezet alakult, ami nagyobb gazdálkodási szabadságot engedett nekik, mint a tééseknek. Ennek a „szabadságnak” a kihasználására még egy évtizedet várni kellett, de az 1970–1980-as években az is bekövetkezett. Erdőbényén mindenki, aki akart, dolgozhatott a fő munkahelyén, amiért ugyan alacsony bért kapott, de azt kiegészíthette egy további munkával a sajátjában, vagy máséban, ahol azt a munkát az adott körülmények között jól megfizették és így sokan megtalálták a jó helyüket a rendszerben. Ezt a lehetőséget veszítették el a rendszerváltás után, amire nosztalgiával emlékeznek.

A rendszerváltás után az 1949 óta tartó lakosságszám csökkenés odavezetett, hogy a fiatalok tömegesen mentek el, az ottmaradt lakosság pedig egyre jobban elöregedett. Ez pedig a lakatlan, olcsó házak megjelenését eredményezte. Az előált lehetőségre a környező városiak találtak választ: Erdőbényén vásároltak házat, amit felújítva második otthonként hasznosítanak. Majd később megjelentek a városi felső középosztálybeli, a dzsentrifikánsok is, akik már nemcsak házat, hanem szőlőterületeket vásároltak, borkészítéshez láttak, vendégházakat alakítottak ki, mert ők felfedezték, hogy napjainkban Erdőbénye tökéletes választás azok számára, akik a hétköznapi pörgésből kiszabadulva egy kis falu nyugalma vágyának. Ebből viszont nekik jó jövedelmük származik. A dzsentrifikánsok és a helyi lakosok életmódja és értékrendje eltérő, ami először ellentétekhez vezetett, majd lassan egy évtized után elkezdték az együttműködést építeni. A múltban úgy alakult, hogy a fejlődést mindig az idegenek hozták el és a helyiek, ha nyitottak feléjük, akkor profitáltak is abból. Az a kérdés, hogy a mostani fejlődés is jó lesz-e az erdőbényei őslakosoknak?

Köszönetnyilvánítás

Köszönöm mindazoknak, akiket megkérdeztem és feleltek kérdéseimre. Külön köszönet illeti Szemán Lilla tanárnőt és Dr. Tóth György jegyzőúrát, akik, utólag is készségesen válaszoltak minden Erdőbényével kapcsolatban feltett részletkérdésemre.

Irodalomjegyzék

- BELUSZKY P. (2022): Rendhagyó városok a Hegyalján. *Észak-magyarországi Stratégiai Füzetek*, 3. 5–13. <https://www.strategiaifuzetek.hu/archivum>
- BENKŐ Á. – WIRTH P. (2015): *Ami megmaradt... hegyaljai zsidó házak*. Budapest: Terc Kft.
- DÖVÉNYI Z. (szerk.) (2010): *Magyarország kistájainak katasztere*. Budapest: MTA Földrajztudományi Intézet.
- KIS J. (2006): Borsod-Abaúj-Zemplén megye 1956. Sátoraljaújhely és Szerencsi Járás. Miskolc: Borsod-Abaúj-Zemplén Megyei Levéltár Füzetek 46.
- KOVÁCS T. (2020): *A paraszti gazdálkodás és társadalom átalakulása*. Budapest: L' Harmattan.
- KOVÁCS T. – BODNÁR Zs. (2016): Erdőbénye: A hagyományos és a posztmodern falu között félúton. *A Falu*, 31. évf. Ősz. 31–48.
- MEDNYÁNSZKY M. (2017): *Kőházak*. Budapest: TERC Kft.
- NEMES G. – ORBÁN É. – TOMAY K. (2022): Meghasadt valóságok – dilemmák a turizmus és a dzsentifikáció szerepéről a vidék fejlődése kapcsán. *Szociológiai Szemle*, 1. 88–113. DOI:10.51624/SzocSzemle.2022.1.5
- TÓBIÁS A. (2020): Útravaló: A Tokaji borvidék. Tokaj: Kikelet.
- TOMAY K. – VÖLGYI B. (2022): Közösség és dzsentifikáció egy vidéki településen. *Szociológiai Szemle*, 1. 65 – 87. DOI: 10.51624/SzocSzemle.2022.1.4
- ZELENÁK I. (2012): *A tokaji aszú titkai*. Budapest: Argumentum.

Források

- <http://erdobenye.hu/tortenete-1051425> (letöltve: 2012.12.12.)
- [https://akovekmeselnek.hu/2018/08/20/az-erdobenyei-kolera-oszlop/\(letoltve 2023.04.27.\)](https://akovekmeselnek.hu/2018/08/20/az-erdobenyei-kolera-oszlop/(letoltve%202023.04.27.))
- Magyarország Helységnévtára Erdőbénye
https://www.ksh.hu/apps/hntr.telepules?p_lang=HU&p_id=25326 (2023.05.05)
- BAZVM. Lt. VII.109. Az Erdőbényei Római Katolikus Elemi Iskola iratai 1922–1948. Anyakönyvi naplók. 1. kötet.
- BAZVM. Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek 2. kötet. 1957.
- BAZVM. Lt. XXIII. 772. Erdőbényei Községi Tanács jegyzőkönyvek 3. kötet. 1962.
- BAZVM. Lt. XXIV. 888. Az erdőbényei községi begyűjtési megbízott iratai 1952–1953
- NÉDA Hosszú idősoros nemzetiségi adatok. Zsidó népesség száma településenként 1840–1941. KSH Budapest 1993. 368–369.
https://library.hungaricana.hu/hu/view/NEDA_nemzetisegi_Zsido_1840-1941/?pg=0&layout=s (letöltve 2022.12.07.)

BOOK REVIEW

Sárosi-Blága Ágnes

**Rechnitzer, János – Berkes, Judit (editors) (2021): Nagyvárosok Magyarországon
/Large cities in Hungary**

Studia Regionum. The series of Centre for Economic and Regional Studies Institute for Regional Studies, Hungarian Regional Science Association and Ludovika University Press.

<https://doi.org/10.32976/stratfuz.2023.20>

The studies in this volume are based on the research launched in 2017: KÖFOP-2.1.2-VEKOP-15 "Development of public services for good governance". In the research programme, the authors aimed at reviewing the development paths of Hungarian cities, analysing their characteristics and understanding their results, in order to identify their possible future directions and the factors determining them. By adapting the territorial capital theory, they examined the defining elements of the urban system, their interconnections and interactions. Eight Hungarian cities (Debrecen, Győr, Kecskemét, Nyíregyháza, Pécs, Miskolc, Szeged, Székesfehérvár) with a population of more than 100,000 and a regional function were selected for the research. The papers in this volume are complex analyses based on the research, providing an opportunity for both comparison and evaluation. In addition to the main results of the research programme referred to, the volume includes information presented at conferences and meetings on the subject, as well as the authors' decades of experience in metropolitan analysis.

The 298-page volume is divided into 15 parts, containing 15 analytical and evaluative studies by 18 authors. In addition to analyses of eight Hungarian cities, separate chapters deal with the specificities of metropolitan development, research trends from 1990 to the present, economic structures and changes, governance models, trends in social structure, changes in land use in metropolitan areas, and cultural potential.

In the first chapter, János Rechnitzer summarises the results and main thematic groups of metropolitan research in Hungary that the authors of this volume consider important, placing them in chronological order and thus giving an idea of the direction of the activities of the researchers working on the topic. The outlook has three dimensions: (1) the directions and trends of metropolitan research, (2) their impact on the development of regional and urban policy, and (3) the contribution of the research carried out to the development of regional science in Hungary and to the strengthening of its scientific nature.

The second chapter of the volume presents the research trends from 1990 to the present, more specifically, the content associated with the concept of the metropolis in Hungarian territorial policy, and how this has changed since the regime change. The author of the chapter is János Rechnitzer.

In the chapter on economic structures and directions of change, János Rechnitzer describes the economic importance of the eight cities analysed and their changes in the national economy, characterising the changes in their economic structure, their main directions, their convergence or divergence from international trends. The analysis is based on national research and current data. In the chapter entitled Governance Models, Dávid Fekete examines the governance activities of the eight Hungarian cities under discussion in relation to the two trends presented in the previous chapters of the book. He presents, evaluates and systematizes the governance characteristics of Hungarian cities. The study concludes that the governance processes of Hungarian cities are mainly generated by projects supported by EU regional policy, which contribute to the emergence of new instruments and trends in European urban governance processes. Based on these trends, governance is no longer the monopoly of economic development alone, and other approaches, such as cultural aspects and cooperation, are increasingly coming to the fore.

In the fifth chapter of the volume, Viktória Szirmai and Júlia Schuchmann analyse the social

structure, social relations and the system of social inequalities of Hungarian cities. They examine how social structural characteristics can affect economic development.

In the sixth chapter, Tamás Csapó analyses the transformation of land use in cities, and more precisely how the image and structure of cities changed after the regime change, and what common features and differences there are. In his summary, he concludes, that the image and structure of large cities have changed considerably following the regime change, becoming more urbanised. It also notes that the differences between cities are largely due to their historical past and their natural geography.

In the seventh chapter, Zsófia Rechnitzer presents a number of aspects that can be used to analyse the cultural potential of Hungarian cities. The study examines the institutional embeddedness of cities in three cultural fields: theatres, libraries and public collections.

The eighth chapter of the volume is about Debrecen. Gábor Kozma and Ernő Molnár describe the city's most important features and its development after the change of regime. They conclude that the ongoing industrial investments are expected to lead to a spectacular increase in Debrecen's economic performance: a strong re-industrialisation, foreign capital, large companies and a stronger role for exports.

In the ninth chapter, János Rechnitzer and Judit Berkes analyse the development trajectory of Győr, using the territorial capital theory and its local adaptation to show the stages of development, the elements of renewal and their survival.

In the tenth chapter, Imre Kanalas examines the factors of Kecskemét's development. He concludes that the challenging periods in the city's history and the decisions and solutions associated with them have provided lessons and models for society in future eras.

The eleventh chapter describes the historical, natural and environmental characteristics of Miskolc, and analyses the city's development path. It is concluded that for the successful development of the city in the future, it would be necessary to return to the old roots of an inclusive city, community building and community cohesion.

The author of the twelfth chapter on Nyíregyháza is Éva Filepné Nagy, who, based on an analysis of the city's development trajectory, concludes that "the strengthening of the Miskolc-Nyíregyháza-Debrecen agglomeration is noticeable, but to find out whether the county seat of Szabolcs-Szatmár-Bereg could have made more use of its opportunities, more thorough comparative analyses would be needed, for example, in terms of income, employment and livelihood opportunities."

In the thirteenth chapter, Szilárd Rácz, Zsolt Sándor Kovács and Réka Horeczki present and analyse the milestones that have influenced the development path of Pécs. At the end of the study, they conclude that a slow development and transformation path based on endogenous resources is outlined for Pécs in the current economic period, on which the city has already been launched.

In the fourteenth chapter, György Vida and Imre Lengyel examine the framework of Szeged's development and evolution, in which they argue that the historical past plays a significant role. In their study, after a brief historical overview of the events that still affect Szeged today, they first provide an overview of the main developments after the regime change and the current situation of the city. They then outline the future development of Szeged in the perspective of local and national development visions, opportunities and constraints, taking into account the historical determinants.

The final chapter of the volume contains an analytical and evaluative study of Székesfehérvár by Nóra Baranyai. After a brief historical overview, the paper presents the main milestones and key areas of the city's development.

The aim of the above description is to briefly present the themes of the papers published in the volume on the eight Hungarian cities with more than 100,000 inhabitants and regional functions (Debrecen, Győr, Kecskemét, Nyíregyháza, Miskolc, Pécs, Szeged, Székesfehérvár) and the approaches to the research carried out. Despite the thematic unity of the volume, the analytical and evaluative papers on the different cities stand on their own and provide a unique insight into the major milestones and issues in the development of the cities.

Szerzőink

| | |
|------------------------|--|
| Dudás Sebestyén Sándor | Pázmány Péter Catholic University |
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Szerzőink figyelmébe

A szerkesztőség kéri a szerzőket, vegyék figyelembe a formai megjelenésre vonatkozó alábbi szempontokat:

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A „Tanulmány” rovatban maximálisan 35.000, a többi rovatokban maximálisan 18.000 karakter terjedelmű tanulmány közölhető.

A tanulmány elejére öt soros összefoglalót, valamint 3-5 kulcsszó megnevezését és JEL-kód meghatározást kérünk.

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Kb. 10-15 sorban rövid összefoglalót kérünk a tanulmányról angolul, valamint a cikkben szereplő ábrák és táblázatok címét is kérjük angolul.

Kérjük a szerző adatainak megadását az alábbiak szerint: név, tudományos fokozat, beosztás, munkahely

Szöveg formázása

Oldalméret: JIS B5 – 18,2 x 25,7 cm.

Margók: fent: 2,22, alul: 2,5, balról: 2,5, jobbról: 2 cm; fejléc és lábléc: 1,25 cm.

Betűtípus és betűméret: Times New Roman 10-es, a jegyzetek 9-es betűmérettel.

Bekezdések: cím után nincs behúzás, egyébként 0,7 cm, a bekezdések között sorkihagyás nincs.

Címek: stílusbeállítás nélkül, fő cím és a fejezetek címek vastag, az alfejezetek címei vastag és dőlt betűtípussal.

Szövegek kiemelések: szimpla dőlt betűtípussal.

Ábrák, táblázatok:

Terjedelmi okok miatt kérjük, hogy egy tanulmányban legfeljebb 4-5 ábra szerepeljen.

Az ábrákat (pl.: térképek, diagramok, rajzok, fényképek) és táblázatokat megfelelően formázva a szövegbe építve kérjük elküldeni. A fénymásolással, szkenneléssel készült ábrákat nem tudjuk elfogadni, mert a nyomda számára nem megfelelő a minőségük. Színes ábrák közlésére sincs módunk. Mindenképpen szükséges az ábrák és táblázatok külön számozása (pl.: 1. ábra; 2. ábra; 1. táblázat; 2. táblázat), s hivatkozásuk pontos feltüntetése a szövegközben, zárójelben, döntve: (1. ábra) vagy (1. táblázat).

Az ábra címét az ábra alatt, középen elhelyezve, a táblázatok címét a táblázat fölött balra igazítva kérjük elhelyezni. Az ábrák és táblázatok alatt fel kell tüntetni a forrást is. Ha saját készítésű az ábra, akkor a „Forrás: Saját szerkesztés, ill. Saját számítás.” megnevezést kell használni.

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Az irodalomjegyzékben csak olyan tételek szerepeljenek, amelyekre a szövegközben hivatkozás található, s minden meghivatkozott irodalmat feltétlenül fel kell tüntetni az irodalomjegyzékben. A jegyzeteket kérjük a szöveg végén, számozott formában elhelyezni. A jegyzetek a főszöveg kiegészítéseit tartalmazzák, ne legyen bennük pl. ábramagyarázat, hivatkozás.

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Köszönjük!

Szerkesztőség

Notes for Contributors

The editorial board of the journal welcomes studies on economic, regional and social issues in Hungarian and in English language. Our journal was launched in 2004. It is published four times a year from 2021 (of which once in English and three times in Hungarian). We are waiting for studies, essays and book reviews submitted for the first publication only. The studies are rated by two double-blind reviewers in each case.

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Péteri G. (1991): Az önkormányzatok és oktatási intézményeinek viszonya, finanszírozási kérdések. In: Önkormányzat és iskola. (szerk.: Kozma T.) Oktatókutató Intézet, Budapest, pp. 122-154.

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