



PROSPERA regional report – municipality of Debrecen

An analysis of the peri-urban area that surrounds the municipality of Debrecen

Spring of 2020

Template with details on Policy Instrument

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This regional report was produced within the PROSPERA project, funded by Interreg Europe.

More information? See the project's website: www.interregeurope.eu/prospira/

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Objective and outline of this report

This regional analysis report was developed within **the Interreg Europe project [PROSPERA](#), PROMoting Sustainable development and regional attractiveness through PERi-urban Areas**. The project's overall objective is to improve regional policies on protection and promotion of natural heritage by tackling loss of ecosystem services and to improve sustainable development in peri-urban areas threatened by urban sprawl. The ultimate aim of PROSPERA is to prevent biodiversity loss, soil consumption and further degradation of natural assets, by in parallel leveraging on those challenge as a way to favor regional attractiveness and economic sustainable development. To that extent, PROSPERA sets up a process of interregional learning that includes study visits and knowledge exchange sessions.

To provide sufficient and adequate background throughout the interregional learning process, each region that is involved in PROSPERA, developed a regional analysis report. In other words, each regional analysis report aims to inform the own stakeholders as well as stakeholders from other partner about the characteristics of and the challenges in their local peri-urban area. As such, **the present report is a guide for all PROSPERA partners and their local stakeholders when visiting or interacting with the municipality of Debrecen**. The information in the regional analysis report is not exhaustive but specific to the objective and rationale of the PROSPERA project. The regional analysis reports were developed in the first year of PROSPERA via a step-by-step process, including surveys and a workshop on the regional analysis report.

The report consists of different parts. **In the first part** of this report the municipality of Debrecen **sketches its general context**. This part includes information on the geographical location of the PROSPERA region, the local demography and the built environment.

The second part of this report **analyses the economic development** of the local peri-urban area, whereas a **third part focuses on the natural heritage**, both PROSPERA core themes.

The fourth part of this report **describes the policy instrument "Integrated Urban Development Strategy (IUDS)"**. In accordance with the project's outline, the municipality of Debrecen selected a specific policy instrument to be subject of PROSPERA. The underlying idea is that PROSPERA could provide support to improve this policy instrument.

Finally, **the last part** of this regional analysis report **identifies local good practices already in place**. These good practices are as a source of inspiration for other peri-urban regions dealing with similar challenges.

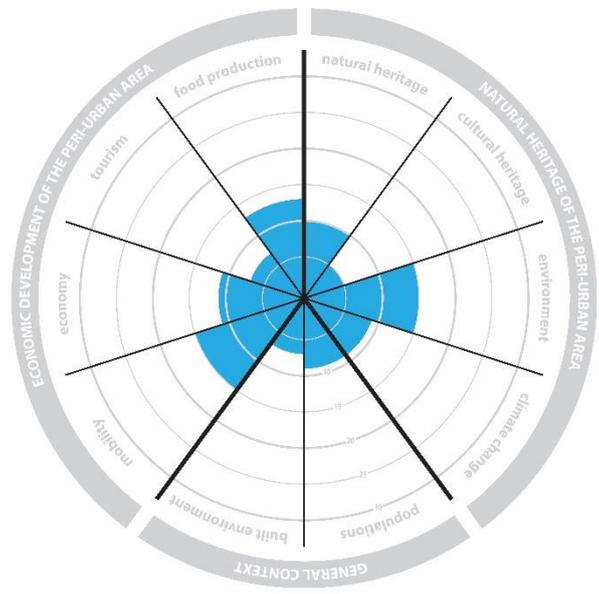
Setting the scene

Since Debrecen is located in one of the least developed NUTS2 regions in Europe in terms of GDP per capita, economic development of the city is the most important target of the city. Debrecen has a relatively large administrative area of 461,6 km² and due to this, potential areas for business investments are available. Thanks to the systematic economic development efforts, big multinational companies chose (BMW, Krones, Deufol, ThyssenKrup etc.) Debrecen as a place to invest in and created more than 6000 new jobs. New industrial sites are located in the peri-urban areas of the city so in that context, **economy is an important theme**. In the Western part of the city, there are large-scale arable lands thus **agriculture** plays an important role in the economy as well. Three organizations (Xanga Group, Kristály 99 Ltd., Tierra-21 Ltd.) of the stakeholder group are private companies that represents the relative importance of economy theme. As a part of the economy, **tourism** is getting an increasingly important role and the development of International Airport of Debrecen will have affect the peri-urban areas.

The population of the city is stable, however, ageing population and emigration of youth are recorded in the demographic indicators. As for peri-urban context, **the population of peri-urban areas** increased mainly due to the inhabitants that moved out from the inner-urban areas. Population growth of peri-urban areas poses another challenge to the city in the case of **the built environment**, as the population of the enclosed gardens is also significant. Regulatory issues on these gardens are inevitable. Responsible body for this theme is the Chief Architect Office, which is a member of our stakeholder group.

As a result of high real estate prices in the inner-urban areas, more and more people are moving to the peri-urban areas and from out of the city. Considering that the population of the neighboring settlements is growing and the number of the cars has doubled in the last 20 years, **mobility** constitutes very important challenges for the city. Increasing car traffic and the sustainability of mobility are all important issues for the future.

The first protected area of the country was established in Debrecen. For this reason environmental protection and the preservation of natural values have always been important issues in the city. Thanks to natural endowments, 34% of the territory are forestlands. Therefore, the **themes environment and natural heritage** together are also important. Related to these themes, **climate change** effects will have a significant impact on the environmental systems. To tackle these challenges the Green Space Development Department of the Mayors Office is involved in PROSPERA as a stakeholder.



Picture 1 – The relative importance of theme's and challenges in the peri-urban of Debrecen

1. General information on the municipality of Debrecen and its surrounding peri-urban area

The following paragraphs provide some general information on the territory of the city of Debrecen, case study in the PROSPERA project, with a focus on the peri-urban area. This information isn't exhaustive but aims to provide sufficient background in order to enable a learning process together with local stakeholders as well as a transnational learning throughout the PROSPERA project.

1.1. Geographical location



Map 1: The location of Debrecen in European Union (source: PROSPERA templates)

The city of Debrecen is situated in Eastern-Hungary, in the Northern Great Plain region (NUTS2). It is the seat of Hajdú-Bihar County (NUTS3). The administrative area of the city is 461.6 km². Thanks to this Debrecen is the 3rd largest settlement in Hungary.

Figure 1 shows the population size between 2008 and 2018 based on the statistics of HCSO. **Debrecen has a stable population, slightly above 200,000 people.** There are no precise forecasts for the future projection of the population size, however, due to massive economic development in recent years, **population growth is expected in the future.**

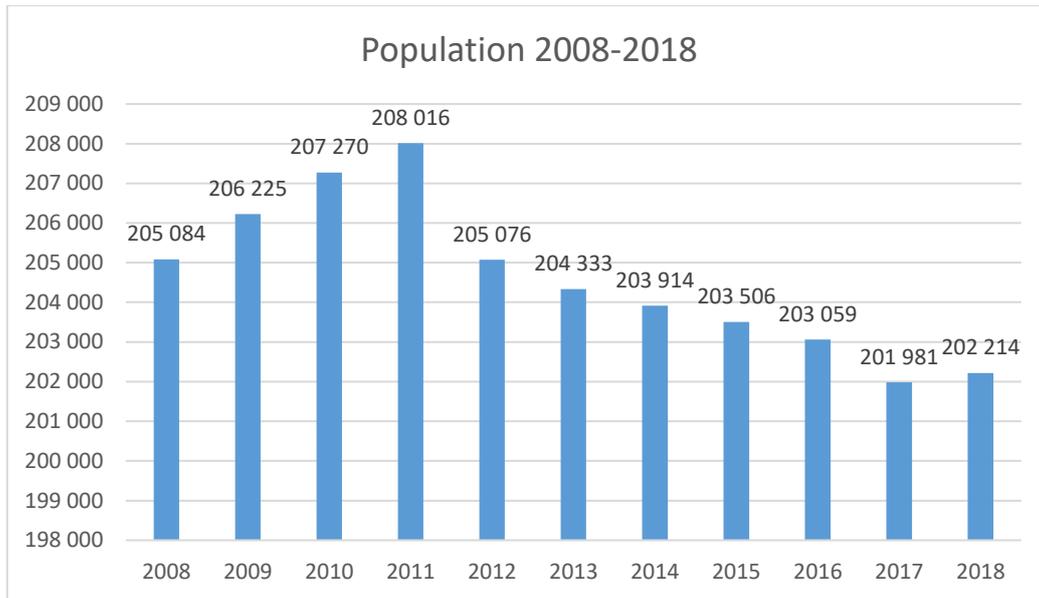
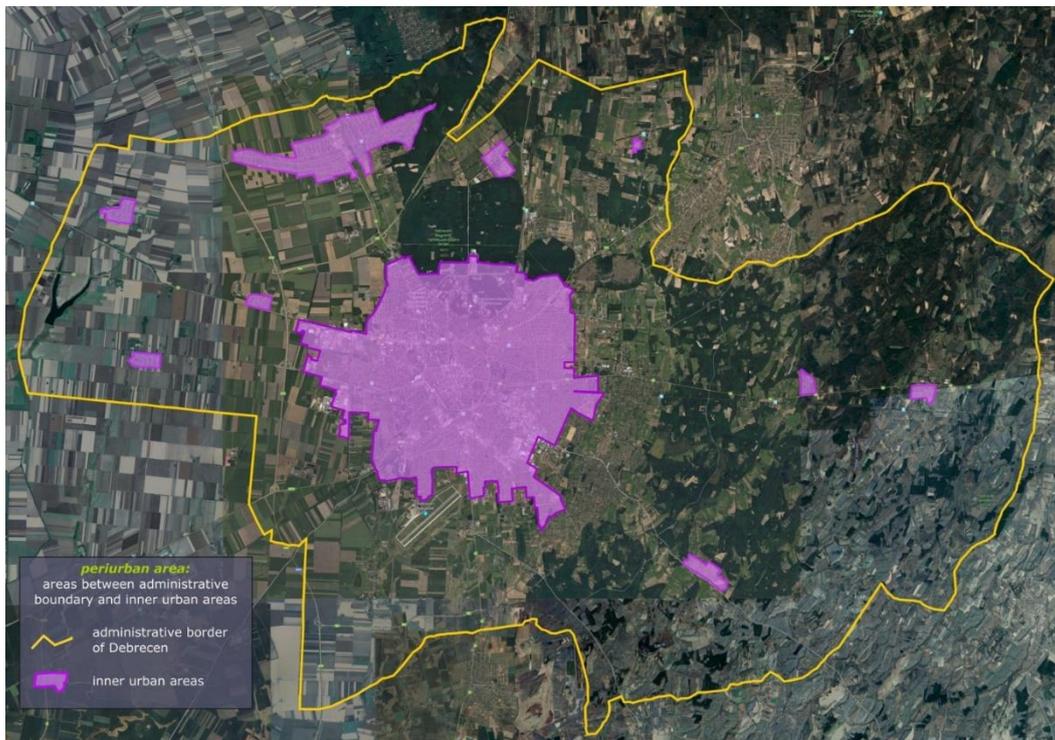


Figure 1: Population size between 2008 and 2018
Data source: HCSO, 2008-2018.

1.2. Identification of the peri-urban area



Map 2: Identification of peri-urban area

The whole city area is 461.6 km² of which:

- approximately 362 km² are peri-urban areas
- 99.7 km² are inner-urban areas (marked purple in Map 2)

1.3. The demographic context

In Debrecen there were 202,214 inhabitants in 2018 that means the **city is the second largest settlement in Hungary in terms of population**. The **population density** is 438 inhabitants/km² for the whole administrative area which is **higher than the national, regional and county average** (see Figure 2).

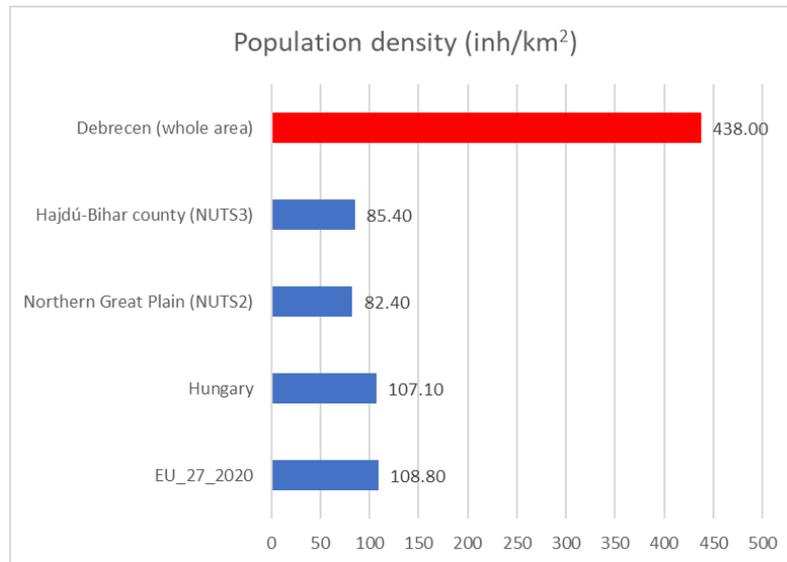


Figure 2: Population density in PROSPERA countries and in different Hungarian administrative levels
Data source: EUROSTAT (2018.) and HCSO (2018.)

Table 1 presents the population in peri-urban and urban areas. **The population increased in the peri-urban areas** from 2011 to 2016 by 26% which is higher than the growth recorded in urban areas, although the population density is still less than half of the national average. This change may result from **sub-urbanization and the high prices of properties**.

	Inhabitants			Population density (inh/km ²)	
	2011	2016	Change	2011	2016
Urban areas	197,265	198,297	+1%	1,979	1,989
Peri-urban areas	14,055	17,721	+26%	39	49

Table 1: Population in urban and peri-urban areas
Data source: 2011 Census (HCSO) and Municipality database (2016)

Moreover, at about **half of the peri-urban population is living in the so-called enclosed gardens**, in the Eastern edge of the city. The problems and challenges of these enclosed gardens will be later explained in 1.4 The built environment section.

Debrecen has a relatively good position in terms of average income: according to the calculation of EDC Debrecen based on statistics from the National Tax and Customs Administration, in 2017 the average monthly income in Debrecen was 186,255 HUF, while the national income was 175,908 HUF.

The **demographic challenges** that Debrecen has to face are the **ageing population** and the **emigration of youth**. The ratio of the 65- x aged population has risen (see Figure X) from 14.4% to 18.13% during the period 2008-2018.

Another challenge is the emigration of youth which can be observed in **net migration** and the share of 15-39 aged people. During the period 2014-2018, out-migration (more emigrants than immigrants) was recorded. In fact, net migration rate was the highest in 2018. Besides this, according to the statistics of HCSO, the highest drops were seen in the share of young adult age groups (15-24 and 25-39) between 2014 and 2016 (see Table 2). Further higher education and working abroad processes contributed to the increase of the emigration of young adults.

	0-14	15-24	25-39	40-54	55-64	65-x
2014	13.8	12.5	22.8	20.0	13.9	16.9
2016	14.0	11.7	21.8	21.1	13.5	18.0
change	+ 0.2 %	-0.8 %	-1.1 %	1.1 %	-0.5 %	1.0 %

Table 2: Share of age groups between 2014 and 2016
Data source: HCSO, 2014 and 2016.

1.4. The built environment

In terms of built environment, the city has several challenges. First, **the city has a relatively large amount of residential blocks** which were built in the socialist era (1960-1990). These buildings need to be renovated. At about 30% of the inhabitants are living in these blocks. There are some ongoing renovation programmes funded partly by the owners and partly by the central government.

Another challenge is the **affordability of housing**. According to the Housing Market Report of National Central Bank of Hungary, which was published in November 2019, **Debrecen had the highest price-to-income ratio** among Budapest and other regional centers (see Figure 3). Price-to-income ratio measures the ratio of average house prices to average income and can be used to summarise the regional disparities in housing cost affordability. This fact might have significant impact on moving out of the city, to the surrounding settlements and of course to the peri-urban areas. Thus, higher prices of houses in the inner-urban areas have a key role in the increasing population of peri-urban areas as well.

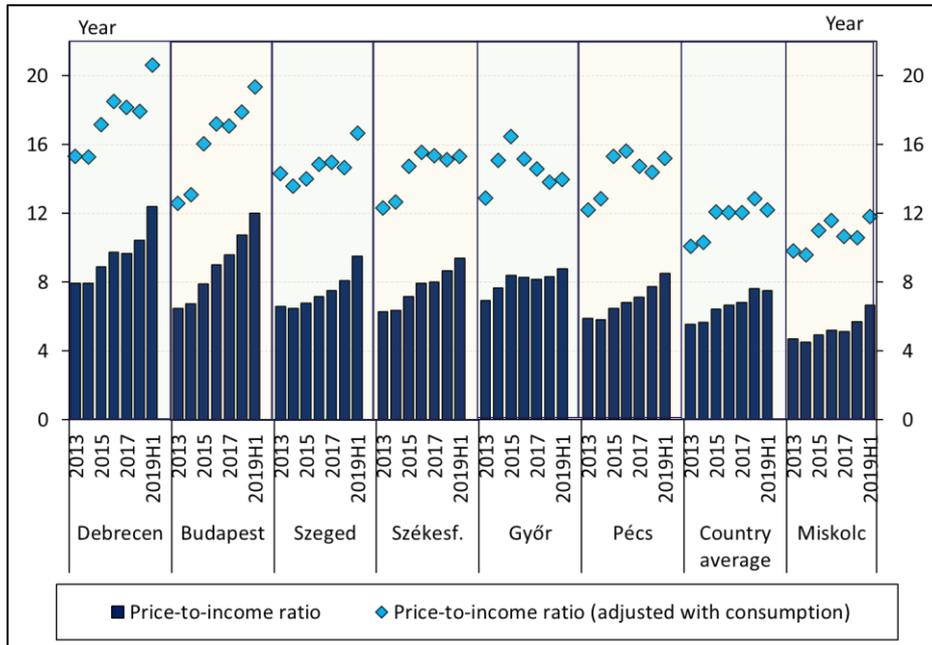


Figure 3: Price-to-income ratios in Hungary's regional centres
Data source: Magyar Nemzeti Bank, 2019.

The number of dwellings in the city is constantly rising, however, **the ratio of newly built dwellings in a year did not reach 1% of the total housing stock** (see Figure 4). In order to guarantee the renewal of the housing stock it is crucial to reach min. 1%.

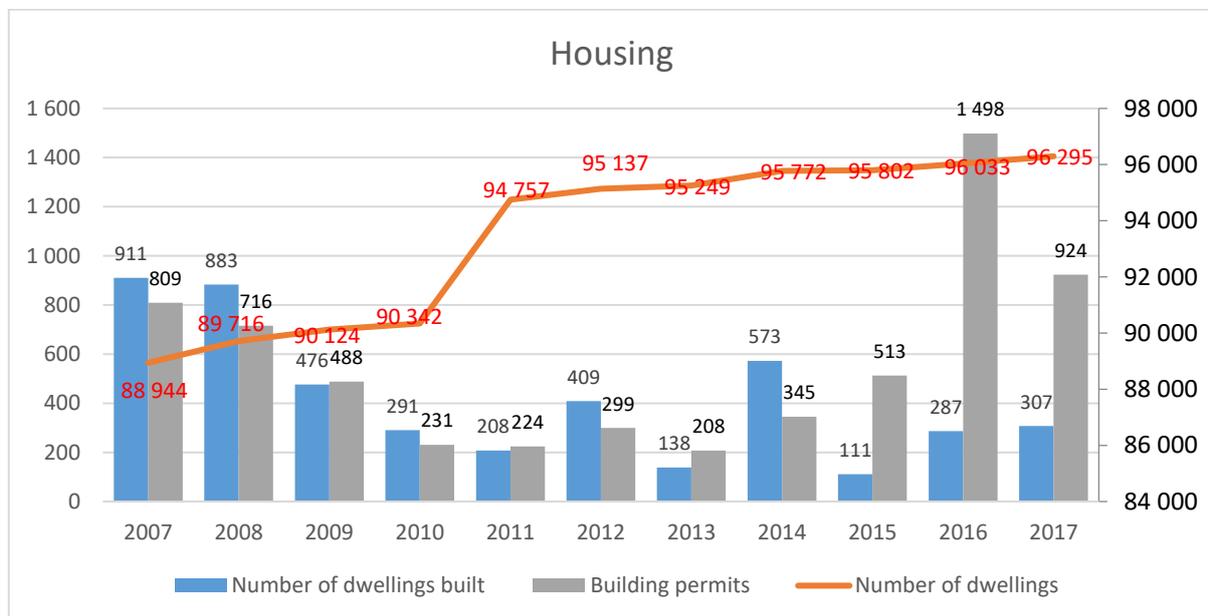


Figure 4: Numbers of housing stock
Data source: HCSO and Municipality database.

According to the database of the Municipality, **at about 8% of the population lives in the peri-urban areas** and the number is increasing. Therefore, the **growing number of peri-urban population** is quite a challenge for the city. If we look more deeper in the peri-urban areas, we can see the phenomenon of **enclosed garden structure**. This land structure started to develop from the 1950's. The owners of

these gardens were inhabited by people who lived in the central inner urban area. These gardens functioned as weekend gardens for gardening activities and for pleasure. After the fall of communism, a lot of inhabitants who could not afford to live in the inner urban areas moved out to these gardens. Rising real estate prices have further contributed to this process. In addition, the regulatory framework in these areas was less strict that led to illegal constructions and unfavorable urban structures (narrow streets, varying plot sizes etc.) There is an opportunity to convert these gardens into inner urban area but to do this, the Municipality has to establish basic infrastructures: roads, utilities, public lighting etc. Due to the unfavorable structure **the cost of building infrastructure** is much more expensive than usual.

2. Economic development of the peri-urban region

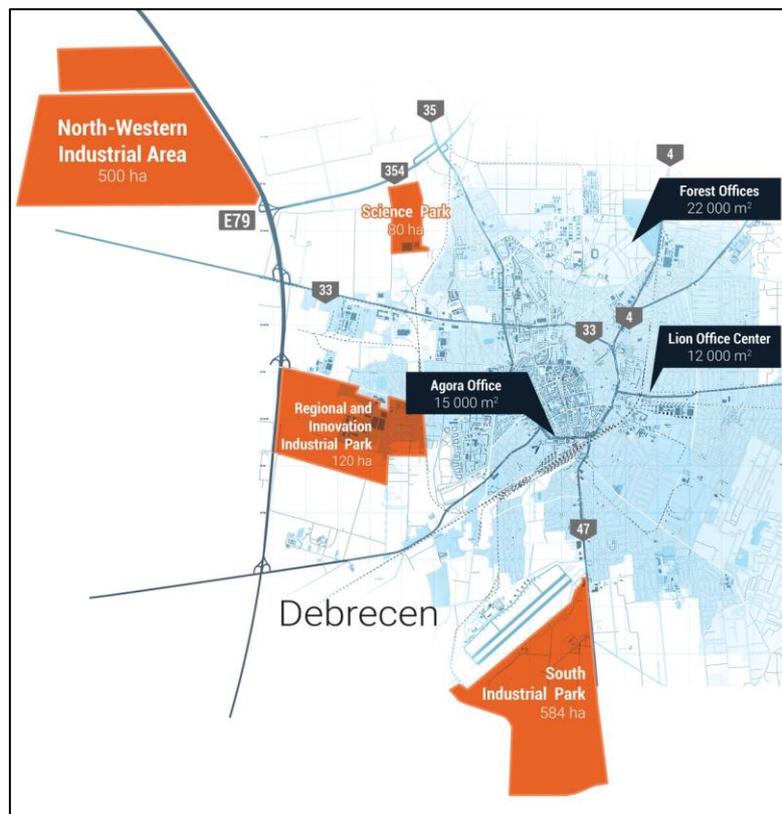
2.1 Economy (industry, offices, retail, etcetera)

In the peri-urban area of Debrecen the four **industrial areas** (see on Map X), **Debrecen International Airport** and **agriculture lands** are linked to the economy.

The main industrial activities in the peri-urban area of Debrecen are pharmaceuticals, food production, electronics manufacturing, automotive industry and machinery manufacturing.

Industrial parks

The four industrial parks are situated in the Western and Southwestern area of the city and covers ~1,200 ha.



Map 3: Industrial sites in Debrecen

Source: EDC Debrecen

- 1.) **South Industrial Park:** It covers 584 ha next to Debrecen International Airport with 1,170 employees. The most important companies are Vitesco, Krones, Deufol, Inter Traction Electrics etc. Further investments are expected here.
- 2.) **Regional and Innovation Industrial Park** covers 120 ha but only app. the half of the whole area is situated in peri-urban areas with 6,000 employees in total. Transcosmos, Richter Gedeon, RR Donelley etc. are companies in this industrial park.
- 3.) **Science Park** is owned by the University of Debrecen and it is 60 ha large with 1,500 employees in focus of R+D. The most important companies are IT Services and Thyssenkrupp.
- 4.) **North-Western Industrial Area** is a new area that is covers 500 ha and it will be the place for the new BMW plant.

Debrecen International Airport

Debrecen International Airport's passenger traffic was 600,000 in 2019. There are 19 destinations from the city and there are several charter flights during the summer as well. There's a need to improve the infrastructure of the airport and to increase the number of passengers.

Labour force availability

The unemployment rate is 4.41% that is higher than the national average (3.64%).

In short term there is a sufficient labour pool to allow a fast and smooth ramp up. Firstly, there are 80,000 students in vocational and grammar schools, and 15,000 graduates per year. Secondly, the existence of skilled workforce: 41,000 employees in manufacturing industry (top 60 companies) in the region. Thirdly, the region is attractive for Ukrainian, Romanian, Slovakian workers.

The major challenges in terms of economy

Debrecen has **high interest in investments**; thus the city is experiencing huge economic growth: big multinational companies (BMW, Krones, Deufol, ThyssenKrup) chose Debrecen as a place to invest in. More than 6,000 new jobs were established and more than EUR 2 billion foreign direct investment to the city of Debrecen were brought, making the city the 'investment champion' of the region. Further investments are likely to come. Challenges the city has to face: **dealing with the effects of economic growth**, on the one hand positive effects like increasing incomes, more well-paid jobs, higher standard of living etc; but on the other hand negative effects like the affordability of housing, commuting to the industrial areas that will cause pollution etc.

2.2 Food production

(We only have current statistics on the level of Hajdú-Bihar county that is 6,211,000 ha)

Main farming activities

The main farming activities are arable farming, animal husbandry and horticulture.

Arable Farming

The main arable crops are corn (101,500 ha), sunflower (52,100 ha), autumn wheat (60,400 ha) and colza (7,600 ha).

Animal husbandry

The main types of animals that are bred are cattle (stock: 105,500 pieces), pigs (stock: 369,900 pieces), sheep (stock: 245,200 pieces) and hens (stock: 5,995,500 pieces).

Horticulture

Fruits have the highest crop yield per year (82,551 t), after that vegetable comes with 1,817 t and the third ones are the grapes (818 t).

Concerning the areas, sour cherry is the largest with 841 ha, after that apple (578 ha), walnut (248 ha) and plum (130 ha) comes.

Aquaculture

In Hajdú-Bihar county approx. 6,000 farmers reported additional irrigation needs on nearly 140,000 ha.

Economic importance

In Hajdú-Bihar county at about 250 economic organizations with a total revenue of € 520 million (HUF 174 billion), 5,700 employees and approx. 18,000 individual farmers were recorded in 2018.

The weight of agriculture in the county is relatively high- its contribution to GDP more than double the national average, in 2014 it was 11%.

We have data on a local level (Debrecen) from the Agricultural Census 2010, so the number of private farmers and entrepreneurs is 4,999 and the number of agricultural enterprises is 125.

Land size

The agricultural land size in Hajdú-Bihar county in 2019 was 617,700 ha. The majority are arable lands with 325,100 ha, after that uncultivated lands (85,900 ha), forest lands (69,900 ha) and fruit lands (3,000 ha) come.

On local level according to the Agricultural Census 2010 42,231 ha land is used of agricultural enterprises. 25,557 ha is used of private farmers and private entrepreneurs. The average farm size of agricultural enterprises is 337.8 ha and the average farm size of the private farmers and the private entrepreneurs is 5.1 ha.

Major challenges

The main challenges in terms of agriculture and food production are to **find the solutions to increase of the value added**; to **follow the challenges of the technological development**; to find balance between the low payment and labour shortage within the sector from the human resources side; and to **create sustainability methods** (e.g. plastic reduction) in the food production.

2.3 Tourism

Characteristics of tourism in Debrecen

Statistics related to tourism in Debrecen city are as follows (Hungarian Central Statistical Office, 2016):

Number of visitors per year is 149,000. 74% of visitors are from Hungary and 26% of them are from abroad. The average length of stay 2.18 nights/visitor for nationals and 2.75 nights/visitor for foreigners.

Statistics on national level (Hungarian Central Statistical Office, 2016):

Number of visitors per year is 21,444,000. The average length of stay is 5.7 nights/visitor.

The most frequented areas of Hungary are Budapest (~37%), Western Hungary (~25%), Southern Great Plain (~12%) and Lake Balaton (~10%). The Northern Great Plain (including Debrecen) represents approx. 4%.

Tourist season in Debrecen starts in the spring and ends in August. Due to the large number of Hungarian visitors, the most frequented periods are the weekends.

Most of the tourist attractions are connected to the **city centre**. The built environment does not abound in significant architectural attractions. The main sights are the Great Church and other churches and the building of the university.

The **main tourist attraction** of Debrecen is the **thermal water** with a healing effect. Due to the spa and the related medical services, the city is a key destination for foreigners. A smaller part of the Big Forest, located in the northern part of the city, belongs to the inner urban areas. Frequented hot spots can be found here: the Thermal Bath, the Aquaticum Spa, the Open-Air Bath and the Culture Park (Zoo and Amusement Park). The Forest Park is used for recreational purposes.

In addition, number of visitors attending our **cultural institutions and events** is also significant. Our most popular programs are:

1. **Flower Carnival**: it is one of most visited cultural events in Hungary, hold on the 20th August, the State Foundation Day. The city intends to extend the length of stay, thus, a Carnival Week has been organized from some years now, full of programs connected to the Flower Carnival.
2. **Other Events**: sports events, cultural events, religious tourism

Peri-urban areas are characterized by less tourism than **recreational functions**. Relevant areas are as follows:

1. Big Forest (or in another translations Great Forest)

The Big Forest, as a protected natural area of national importance, is also part of the Natura 2000 network. It is mainly located in the peri-urban areas of the city. These parts are mostly used by the locals for recreational purposes (tourist roads).

2. Wooded steppes (Erdőpuszták)

This territory is located in the Eastern part of the peri-urban areas. The wooded-grove-grassy areas dotted with little lakes and reservoirs are visited by city residents for recreational purposes (excursions, cycling, horseback riding and fishing tourism). In addition to being aware of the natural environment (thematic hiking trails, study trails), it is also possible to preserve the cultural heritage (Zsuzsi narrow gauge train).

3. Debrecen International Airport

The airport of the city is located in the Southern part of the peri-urban areas. Its importance in tourism is evident in terms of ensuring the accessibility of the city. The number of its passengers is growing

year by year, as the number of foreign destinations available from the city and the number of flights concentrated here.

Major challenges and aims of development

In terms of tourism and recreation in Debrecen, the **major challenges** are:

1. Development of attractions
2. Lack of hotels
3. Extend the length of stay (2.35 nights/visitor)
4. Extend the tourism season of the city
5. Increase the number of foreign tourists
6. Development of Debrecen International Airport

Regarding peri-urban areas, the goals of development are as follows:

Big Forest

Fostering recreation and preserving natural environment through comprehensive developments: Civaqua program to improve water supply, regular maintenance of undergrowth, control of invasive species, complex renewal of the forest by planting native species. *(IUDS specific territorial objective: V7 Increasing the touristic potential of this urban area and enhancing its educational as well as research and innovation role through the protection of natural heritage)*

Wooded steppes

Further developments of tourist attractions are targeted: improving of accessibility and infrastructural conditions (establishment of suitable accommodation and restaurants, program centres and adventure parks) as well as creating better circumstances for cycling, horseback riding and fishing tourism. Besides the protection of natural environment is also required. One of the essential tasks is to ensure water supply of the lakes. *(IUDS specific territorial objective: V9 Peri-urban areas: Improving the living conditions of inhabitants and development of tourism through protection of natural environment)*

Debrecen International Airport

The development of the airport is of key importance for the progression of the tourism in accordance with the strategic goals of the city. Improving the international accessibility of the city can contribute to enhance the economic potential of Debrecen as well as to increase the number of visitors of tourist attractions. Developments are planned such as construction of a new terminal building and runways, fire barracks, purchase of fire trucks and advanced passenger safety equipment. *(IUDS specific territorial objective: V10 Development of Debrecen Airport in accordance with the strategic goals of the city)*

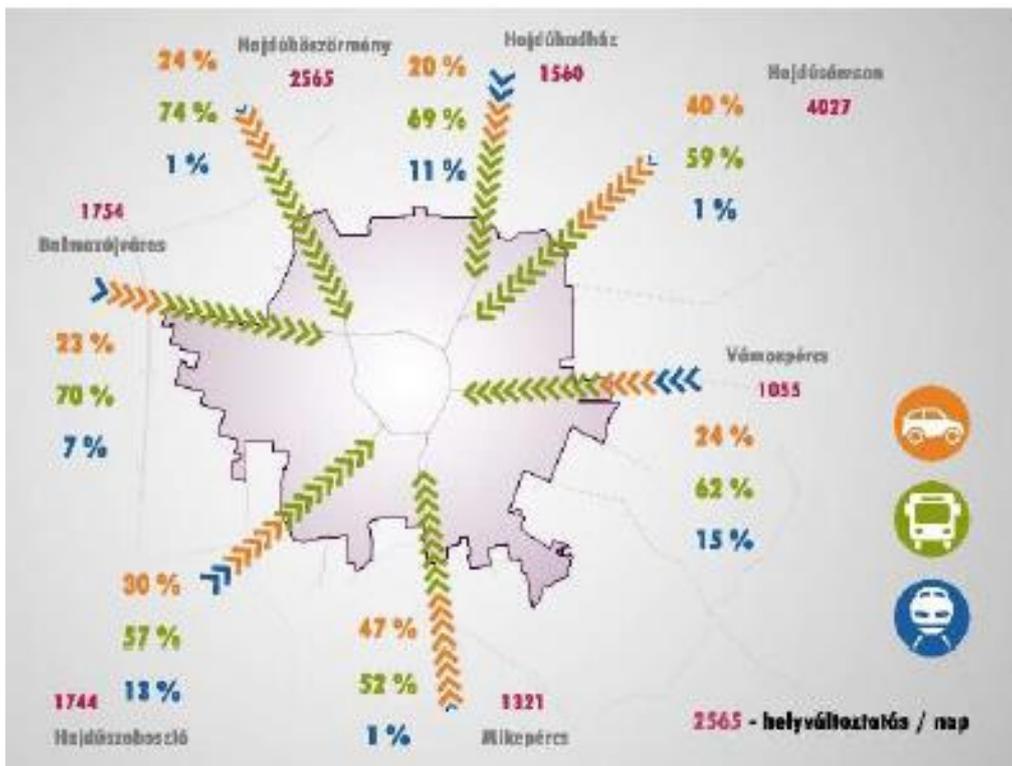
2.4 Mobility

In terms of mobility the mode of transport that inhabitants usually use are: local buses, cars, bikes and walking (see Table 3). Using buses has the highest share (35,2%), although the percentage of car users reach almost third (30,6%) of the journeys.

Journeys taken a day				
	Number of journeys		Percentage %	
	In the territory of Debrecen	Commuting (into the city and outside of it)	Inhabitants of Debrecen	Commuters
Public transport				
Local bus	183,000		35.2%	
Regional buses		36,000	0.0%	29.3%
Regional train		14,000	0.0%	11.4%
Walking, cycling	176,000		33.8%	
Car	159,000	73,000	30.6%	59.3%
Other	2,000		0,4%	
SUM	520 000	123,000	100.0%	100.0%

Table 3: The number and the share of journeys
Data source: SUMP Debrecen, 2016.

According to the SUMP of Debrecen, there were 41,500 commuters and the main commuting directions are shown in Map 4. As the **number of cars in the city nearly doubled in the last 20 years**, the city have deal with the consequences: traffic jams, traffic management. Therefore the biggest challenge is the increasing number of cars in the city. Another challenge is the **modernization of public transport system**. Since Debrecen has huge peri-urban areas, the interconnection with the inner-urban lands is also a challenge, especially the **promotion of sustainable modes of transport**.



Map 4: Commuting directions and the share of mode of transport
Source: SUMP of Debrecen, 2016.

3. Natural heritage of the peri-urban region

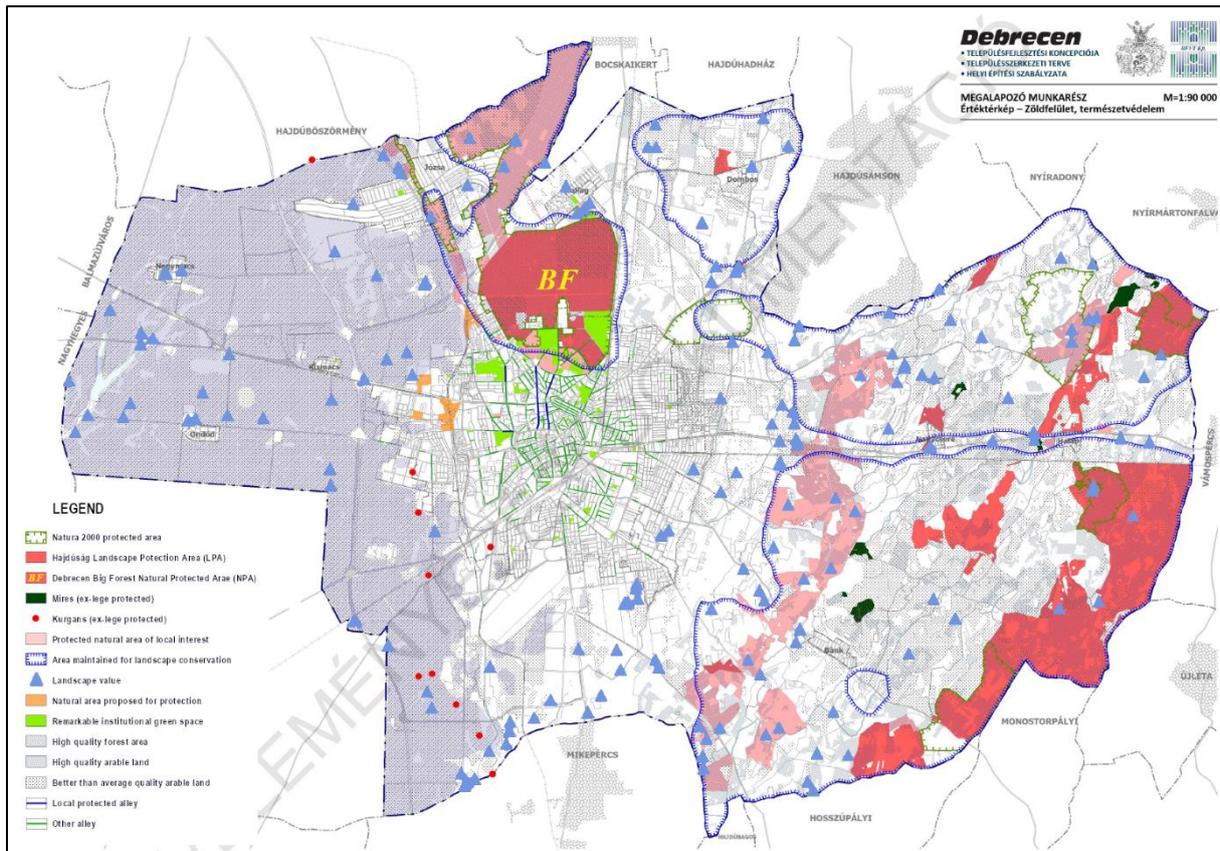
3.1 Natural heritage

Debrecen was founded on the border of the **two characteristics landscape regions**, at the junction of different trade routes. The Eastern part of the town is situated on the sandy **Nyírség** landscape region, while the Western part is on loess grasslands covered **Hajdúság** landscape region. These two landscape regions also differ significantly in terms of vegetation, soil conditions and water supply. That is why the natural endowments of Debrecen are also diverse: in the western part, due to **high quality loess soils** arable farming is existing, while in the eastern and northern areas, **natural and artificial forestlands** are significant on sandy soils with arable lands more characterized by patches.

Different land use largely adapts to the natural values of the city. The administrative area of Debrecen is 461.6 km² and share of **built-up areas are 17%**, (apart from the central inner urban area there are 9 other neighborhoods considered inner-urban areas) **agricultural areas amount 41%**, **34% are forestlands**, 6% are meadows while the rest 2% are water surfaces and other green spaces.

Due to the **large areas of the high fertility soils**, and historical antecedents, agriculture always played a major role in the city's economy. Nowadays, agriculture has higher importance in Debrecen than the average of largest cities in Hungary. Agricultural lands form a contiguous area **in the Western part of the peri-urban areas** with high-fertility chernozem soils. These areas are typical arable lands. In addition, there are some other lands in agricultural use scattered in other parts of the peri-urban areas, especially adjacent to urban areas. On these areas the quality of soils is considered medium or below, thus the arable land use is not so common. In the areas surrounding the inner-urban areas extensive garden culture has grown significantly in recent decades and has great economic value.

Forestlands and close-to-nature areas dominate in the Eastern and Northeastern part of the peri-urban areas. In the East they form a characteristic mosaic structure area of wooded steppes (in Hungarian called "Erdőspuszta"). Forestlands are protected to a large extent: they can be found both on national and international level (e.g. Natura 2000) as well as areas for landscape conservation or locally protected areas. Water surfaces are scattered on the peri-urban areas and since their function is primarily inland reservoirs for excess water, their water level is highly dependent on the amount of precipitation, but they also have a recreational function for the local population. Debrecen has no rivers, only a few smaller creeks (eg Tóció, Kondoros) can be found here.



Map 5: Map of protected areas

Source: Urban planning tools of Debrecen, 2020 february, Budapest Főváros Városépítési Tervező Kft.

Protected areas in the peri-urban areas can be divided into 3 categories:

1. Protected areas by national or international regulations
2. Protected areas of local interest
3. Other protected natural values

1. Protected areas by national or international regulations

Natura 2000 network was established by the European Community and it is a coherent European ecological network that ensures the conservation of biodiversity and contributes to the management and rehabilitation of natural values by protecting natural habitat types, wild fauna and flora of Community importance. The protection of these areas is ensured by Community and Hungarian legislations. Natura 2000 network includes several important nature conservation areas, on the Northern and Eastern parts of the peri-urban areas, which are predominantly forested areas and meadows. They have relatively significant size, reaching a total of 72.5 km². The following table shows the rare plant and animal species of the seven Natura 2000 sites in Debrecen and the basis for their designation (see also Map 5):

Natura 2000 site (site code)	Area (ha)	Species on which the designation is based
Bánki-erdő (HUHN20019)	368.6	<i>Iris aphylla subsp. hungarica</i> (Steppe iris)
Halápi Álló-hegy (HUHN20021)	176.1	<i>Pulsatilla pratensis subsp. hungarica</i> (small pasque flower)

Rauchbauer-erdő (HUHN20022)	205.9	<i>Iris aphylla subsp. hungarica</i> (Steppe iris)
Hármashegyi-tölgyesek (HUHN20023)	501.1	<i>Iris aphylla subsp. hungarica</i> (Steppe iris)
Debrecen-Hajdúböszörményi tölgyesek (HUHN20033)	5634.6	<i>Iris aphylla subsp. hungarica</i> (Steppe iris) <i>Cerambyx cerdo</i> (Great capricorn beetle) <i>Hypodryas maturna</i> (Scarce fritillary)
Tóció-völgy (HUHN20122)	125.5	<i>Spermophilus citellus</i> (European souslik) <i>Emys orbicularis</i> (European pond turtle) <i>Pulsatilla pratensis subsp. hungarica</i> (small pasque flower)
Sámsoni úti bellegelő (HUHN20161)	241.1	<i>Spermophilus citellus</i> (European souslik) <i>Emys orbicularis</i> (European pond turtle) <i>Bombina bombina</i> (Fire-Bellied Toad)

Table 4: Species of Natura 2000 network in Debrecen
Data source: <https://natura2000.eea.europa.eu/>

Hajdúság Landscape Protection Area (LPA) was established in 1988. It lies on the territory of 12 settlements, covering an area of more than 70 km². The management/maintenance of the LPA is regulated by the Ministry of Environment and Water Decree 130/2007. (XII.27.). The LPA is characterized by the mosaics of forests, grasslands and marshes. The reason and purpose of the protection is to preserve the characteristic landscape of “Hajdúság” region and “Nyírség” region (sandy soils), especially the diversity of habitats, their characteristic natural flora and fauna. Hajdúság LPA is located in the eastern part of the peri-urban area of Debrecen and it covers an area of 32.3 km² (see Map X). Many protected and rare plants and animal species can be found there, thus some parts of them are highly protected. Its areas overlap with Natura 2000 network in some areas as well (e.g. Rauchbauer Forest, Bánki Forest, Halápi Álló-hegy).

Debrecen Big Forest (in Hungarian: Nagyerdő) or in other translation Great Forest is a protected natural area of national significance (and part of Natura 2000 network as well). Big Forest is in the Northern part of the inner-urban areas and in the surroundings of the peri-urban area. It was the first area in Hungary that received nature protection in 1939. Initially, the 36 ha large area was destroyed in the Second World War but by 1972 it was expanded with neighboring oak trees. Thereafter, the Minister of Environment further expanded the protected area to the entire forest block of 1,092 ha. Due to the proximity of the city, the forest has a significant not only forestry, nature conservation, but also recreational function. Inhabitants mainly use the part of the forest for leisure purposes with well-developed infrastructure, which is closer to the city center. There are several nature trails and educational centers in the Big Forest that help awareness raising activities in the theme of nature protection. Since it became a protected area 90 years ago, the condition of the forest has deteriorated a lot, and groundwater levels have fallen in recent decades, so special attention must be paid to its proper management.

Due to the force of law (Act LIII of 1996 On Protection of Nature) marshes and kurgans are considered ex lege protected areas. Ex lege protected areas are located in the peri-urban areas and cover approximately 791 hectares. Marshes are linked with smaller watercourses on the Eastern part of the peri-urban areas. Kurgans were erected on burial sites and are located in the Southwestern part of the city's territory (see Map 5) along the valley of Tóció creek.

2. Protected Areas of local interest

The list of protected areas of local interest can be found in Decree of General Assembly of the Municipality of Debrecen No 24/2006 (VIII.14.) on the Protection of Natural Values of Local Importance. This decree also sets the management plan of local protected areas and protected natural monuments. The decree defined 17 protected areas and 31 natural monuments. In protected areas not owned by the Municipality, the obligation of property owners is to use/maintain these areas in accordance with the conditions prescribed in the decree. The examination of protected natural monuments takes place in every year, and if necessary, preservation works are carried out by the Municipality. Most protected areas of local interest are located on the Northern and Eastern part of the peri-urban areas (see Map 5). Along the Northern part of the valley of Tóció-creek and in the area of wooded steppes ('Erdőspuszták') natural and artificial forests and groves, meadows, wetlands can be found. Protected areas of local interest situated in the Northern part of the city territory overlap with Natura 2000 network. Protected areas located in the inner-urban areas of Debrecen are much smaller in size, they include parks, arboretums, and some part of the Big Forest.

3. Other protected natural values

Areas maintained for landscape conservation: according to the Decree of 9/2019 (VI.14.) on Additional regulations on the preparation and application of spatial planning processes, all the areas that have unique landscape values shall be defined in a territory of a settlement. Thus areas maintained for landscape protection include territories that formed as a result of the interaction of natural values and human activity and have aesthetic features and special importance for the landscape.

The landscape character of Debrecen is basically determined by the historically significant urban architecture that fits into the Great Hungarian Plain landscape, the large-scale agricultural landscape, the characteristic farmsteads and the unique character of wooded steppes ('Erdőspuszták'). Debrecen situated on almost flat surface, which slopes slightly from the northeast to the southwest and divided by the valleys of the two main creeks: Tóció and Kondoros. Areas maintained for landscape conservation in Debrecen are located both in the Northern and Eastern part of the city, that are typically forestlands. (Map 5)

The elements of landscape to be preserved in Debrecen are the mosaic-like landscape of Erdőspuszták (with the mixture of meadows and pastures, small plots of arable lands, small urban areas) and the Big Forest.

According to the Act LIII of 1996. on Protection of Nature, unique landscape value is defined as a natural value or formation or an element created by human activity that is significant for the society from a natural, cultural-historical, scientific and aesthetic point of view. In Hungary, National Parks (in the case of Debrecen Hortobágy National Park) has the responsibility of establishing and registering of these kind of values. National Parks are bodies responsible for nature conservation, protection and management of landscape values. In Debrecen, there are 169 landscape values, more than half of them are natural values (Map X). According to regulations, the regulatory plan of the city shall include these landscape values.

Based on what were mentioned above the main land use conflicts and challenges are the following:

- **The decline of indigenous-species and the fragmentation-isolation effect of linear infrastructure elements.** In the case of forest and meadow land use, the decline of indigenous-

species and, at the same time, the spread of invasive species (e.g. acacia, forest pine forests instead of oaks) are problems.

- **Urban sprawl:** in the last few decades, the expansion of enclosed garden structure, industrial-commercial sites has been observed both in areas with high-fertility soils and in valuable natural areas. This has negative effects on the landscape so further expansion should be stopped.
- **Improper management of non-municipally owned protected natural areas.** Problems occur mainly in the vicinity of agricultural lands. For instance, farmers plow into protected grasslands or forestry help the spread of invasive species (e.g. acacia)

3.2 Cultural heritage

Debrecen has basically developed as a typical borough (market town) in the flat, lowland area, and the characteristics of its development are still partly decisive in the urban structure and in the image of the historically built-up areas. Outstanding elements of the architectural heritage are concentrated in the historic center of the city and they are typically protected as cultural heritage. In Hungary *Act LXIV of 2001 on the protection of cultural heritage* regulates the protection of cultural heritage, and it also provides regulations for the protection of monuments, archaeological sites, memorial sites, and cultural property.

In Debrecen 202 elements are **under national monument protection** (110 monuments, 22 elements under general monument protection and 70 elements in monument environments). During the 18-19th centuries, the process of urbanization intensified in Debrecen as well, therefore the city is richer in monuments from this period, several of which are still characteristic elements of the cityscape (e.g. Reformed Church, Reformed College, Old Town Hall, Theater, County Hall). Monuments from earlier times are rather exists as ruins. The most famous monuments built in the 20th century are the main building of the University of Debrecen and the Déri Museum. The majority of monuments are located in the city center, and there are only 2 in the peri-urban areas (Halápi Inn and Látóképi Inn).

The two emblematic buildings of Debrecen, which can also be called city symbols, the Reformed Great Church and the Reformed College, are also **national monuments** protected by law, as places of significant importance in the history of the nation.

There are 375 registered **archaeological sites** in the city, 10 of which are protected by decrees or resolutions. Most of the archaeological sites are located in the peri-urban areas, but they do not have a special significance in terms of tourism; archaeological excavations must be carried out at the sites during construction.

Certain territorial and individual elements of the architectural heritage that are not protected by any other legislation enjoy **local protection** in accordance with *Decree 45/2017 (XII. 14.) of the General Assembly of the Municipality of Debrecen on the protection of the cityscape*. The decree distinguishes between local individual and local territorial protection, but among the related elements only Parlagi church ruins at Dombos farm are located in peri-urban areas.

Careful protection of archaeological sites during constructions and land use in peri-urban areas can be considered as a **challenge** in terms of cultural heritage.

3.3 Environment

The main challenges and problems that were mentioned in the part “3.1. Natural heritage” and in “3.2. Cultural heritage” sections have relation with 3.3. Environment theme.

In terms of air quality, the Air quality plan of Debrecen mentions as problem that the Western part of the city lacks protective forest, therefore the dust pollution is significant. The emissions of transport have significant role in ozone pollution: according to the forecasts the growing number of cars and the effects of climate change could contribute to higher ozone concentrations in peri-urban areas.

The challenges are the following:

- **Lack of green corridors and forest belts** and due to this deflation, erosion and dust pollution. Large-scale arable lands without forest belts in the Western part of the city increase dust pollution in residential and transport areas and cause deflation thus decrease in yield.
- **Uncertainty of water supply.** The resupply of surface waters is uncertain, the water supply of green areas, especially forest lands is inadequate and the groundwater level is dropping. The water level of reservoirs located in the Eastern part of the city is low, they are drying up thus losing their recreational function.
- **Wounds and brown fields:** there are some abandoned industrial areas, brownfields in Debrecen (e.g. illegal sand mines) illegal landfills in Debrecen. The recultivation of these areas must be solved.
- **Air pollution** as a consequence of geographical and meteorological conditions and increasing number of cars

3.4 Climate change

The climate of Hungary is determined by the geographical position of the country: it is situated in the deepest region of Carpathian Basin. For this reason, 84% of the land surface is below 200 metres. There are two huge plain regions in the country: Little and the Great Hungarian Plain. Debrecen lies in the Northeastern part of the Great Hungarian Plain.

Climate change effects could be measured by two components: annual mean temperature and precipitation. As for annual mean temperature of Hungary, there has been a steady rise in the last few decades. According to Environmental Atlas of Debrecen, the **annual mean temperature in the city is rising** (see Figure 5) as well. Between 2010 and 2017 the annual mean temperature of the city was 11.4 °C that is 1.5°C higher than recorded in the period of 1971-2000. It is important to mention that since the annual temperature range increases in Hungary from ocean towards the interior of the mainland, the Eastern part of the country has the highest range in the country.

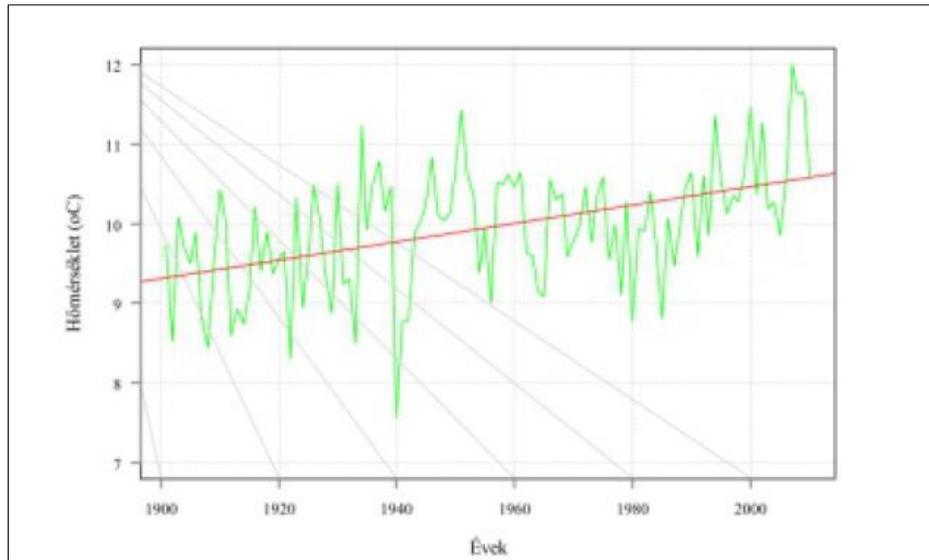


Figure 5: Annual mean temperature in Debrecen 1901-2010

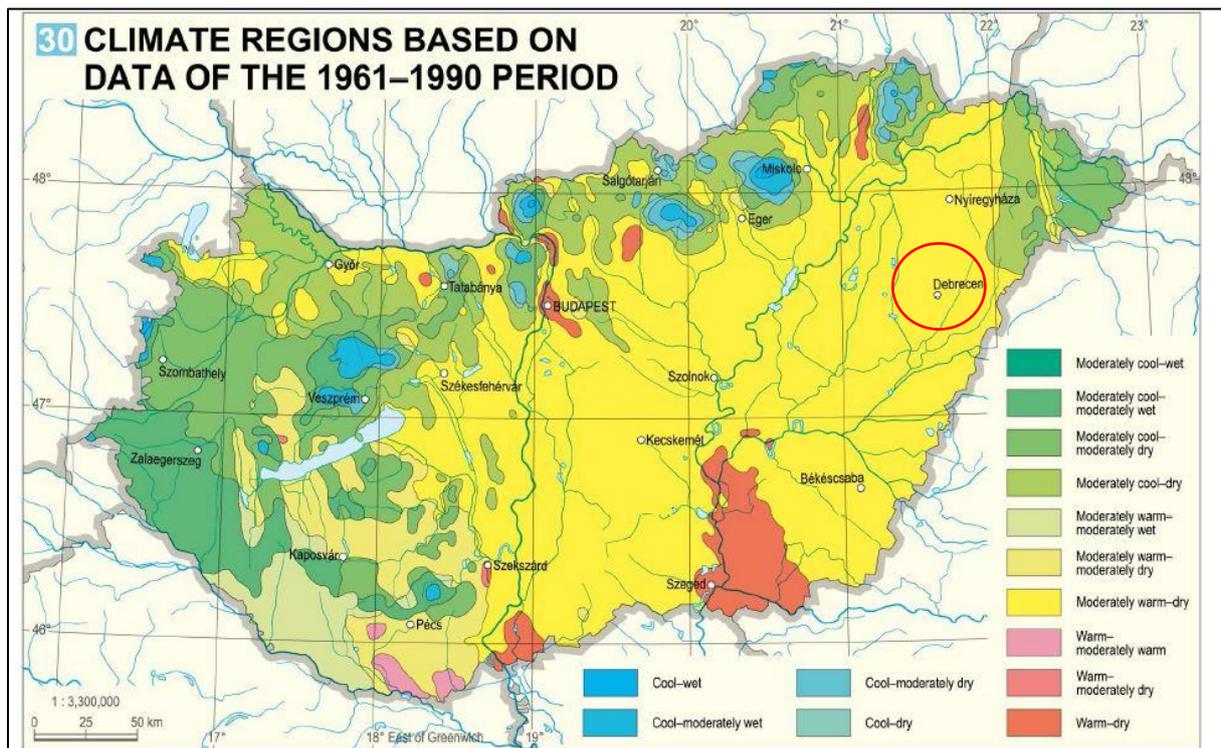
X axis: years

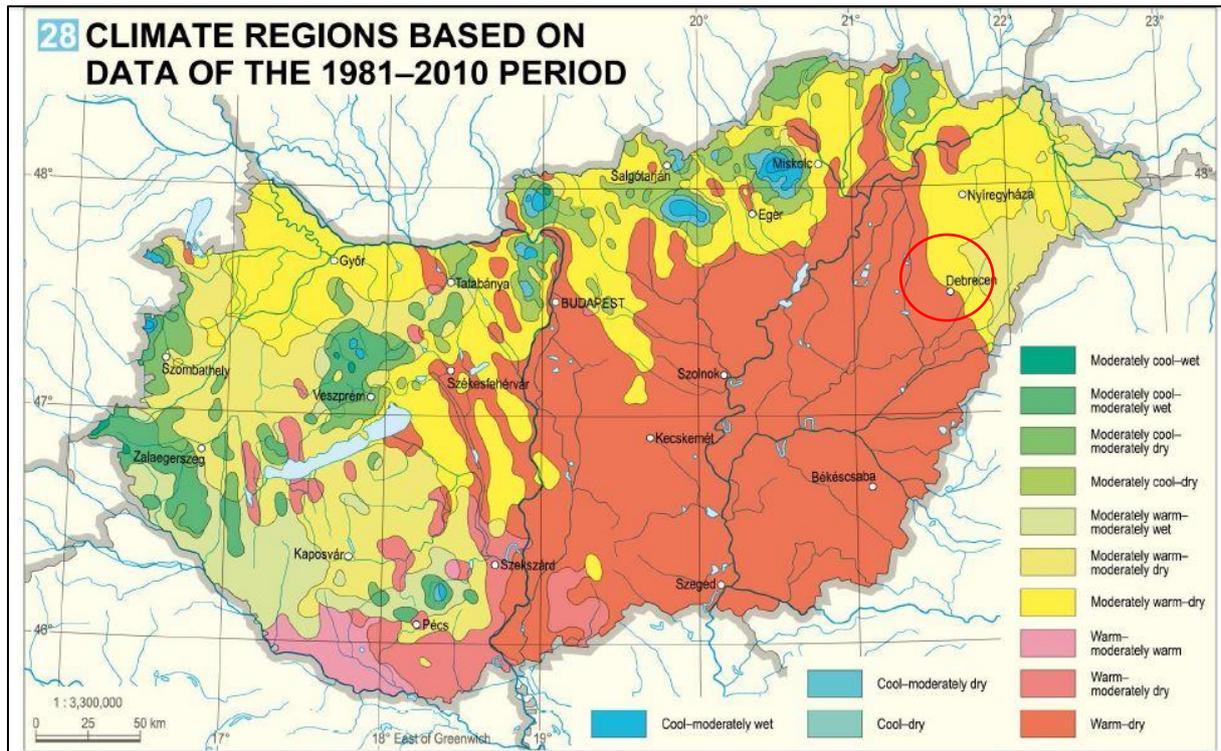
y axis: Temperature (°C)

Data source: Environmental Atlas of Debrecen. 2018.

The annual mean precipitation in the country dropped 5% from 1901 to 2016, so Hungary is beginning to resemble to the Mediterranean climatic region. Recent years have been dominated by extremes. This is evidenced by the data measured in Debrecen, because the highest daily precipitation amounts risen 10 mm.

To summarize the climatic change of the country we present the change of climate regions, which classification is based on a famous Hungarian climatologist, György Péczely' method (See Map 6).





Map 6: Climate regions in period 1961-1990 and 1981-2010
Data source: National Atlas of Hungary, 2018.

Because of the temperature rising the area of warm–dry increased which affected particularly the territory of Great Hungarian Plain. **Debrecen is situated on the edge of warm–dry and moderately warm-dry.**

At national level, the reference period in modelling future climate is between 1961 and 1990. Present day mean temperatures are considered higher. There are two methods (ALADIN-Climate and RegCM) for future prediction of climate change in Hungary. According to these calculations, it can be concluded that mean temperature will continue to increase both annually and seasonally. **Annual means are expected to change by 1 to 2 °C for 2021 to 2050 and by 3 to 4 °C for 2071-2100** with temperature increase over east-southeast being higher than over west-northwestern areas.

What is common in the two methods that they both predict stronger summer drying by 21st century. Moreover, based on the drought index of Pálfi, **the western part of Debrecen belongs to the “strong drought” areas** where most of the arable lands in intensive use are located. Climate change will cause more droughts (with high temperatures at summer) which increase the importance of irrigation. Unfortunately, **the groundwater level is dropping** due to the strong exploitation of groundwater reservoir. Serious shortage of water will damage both the living species and the agriculture.

Regarding the expected processes in Hungary, in the case of Debrecen we are facing with the following challenges:

- **Temperature is rising**
- **Groundwater level is dropping** – (it will damage the flora and the fauna)
- **Extreme weather conditions** (with high daily precipitation amounts)
- **Droughts**

4. Policy instrument “ Integrated Urban Development Strategy of Debrecen (IUDS)”

The fourth part of this regional analysis report describes the policy instrument “**Integrated Urban Development Strategy of Debrecen (IUDS)**”. The **Municipality of Debrecen** chose to review, improve and implement this particular policy instrument throughout the PROSPERA project. In accordance with the ambitions of PROSPERA, the focus lies on the protection and promotion of natural heritage by enhancing the sustainable development of peri-urban areas.

In the next paragraphs attention is given to what extent the selected policy instrument is currently responding to the challenges identified in the region, as described in part 2 and 3 of this report. Furthermore, attention is given to the governmental context and the analysis has been then extended, taking also into consideration other policy instruments that are relevant for the PROSPERA themes.

Furthermore, a window of opportunity is identified to improve this particular policy instrument supported by the PROSPERA project.

4.1. General information

Policy instrument addressed

The name of the policy instrument that EDC Debrecen selected for the PROSPERA project to work on is *Debrecen Megyei Jogú Város Integrált Településfejlesztési Stratégiája* – in Hungarian, and *Integrated Urban Development Strategy of Debrecen (IUDS)* – in English language.

IUDS is a medium-term strategy document that defines the main development directions and areas of the city. This policy instrument is owned by the Municipality of Debrecen.

Geographical action radius

The policy instrument is/will be applied for Debrecen city. The action radius corresponds to the administrative boundaries of the city (MICRO level).

Timing

The IUDS, currently in force, is related to the period of 2014-2020. (Urban development strategies are always adjusted to the relevant programming period of the European Union.)

The (medium-term) goals of this IUDS to be achieved by 2020 are framed by the vision of the Urban Development Concept and its long-term, overarching goals, and strongly influenced by the development directions that can be deduced from the Europe 2020 Strategy: 11 thematic objectives of Cohesion Policy and the investment priorities of the Structural Funds (mainly ERDF, ESF, Cohesion Fund).

The development process of the new policy instrument, chosen to accomplish within PROSPERA, has not started yet. Our aim is to involve the achievements of PROSPERA in the new IUDS that is expected to be prepared by 2021. The construction of new IUDS should be based on the national development framework that is not known at present (since it depends on the new EU strategy defined for the next programming period of 2021–2027). Therefore, there is no exact deadline for the process, yet.

Obviously, that does not mean that issues for peri-urban areas cannot be included in the new policy instrument.

4.2. Governmental context of policy instrument “Integrated Urban Development Strategy of Debrecen (IUDS)”

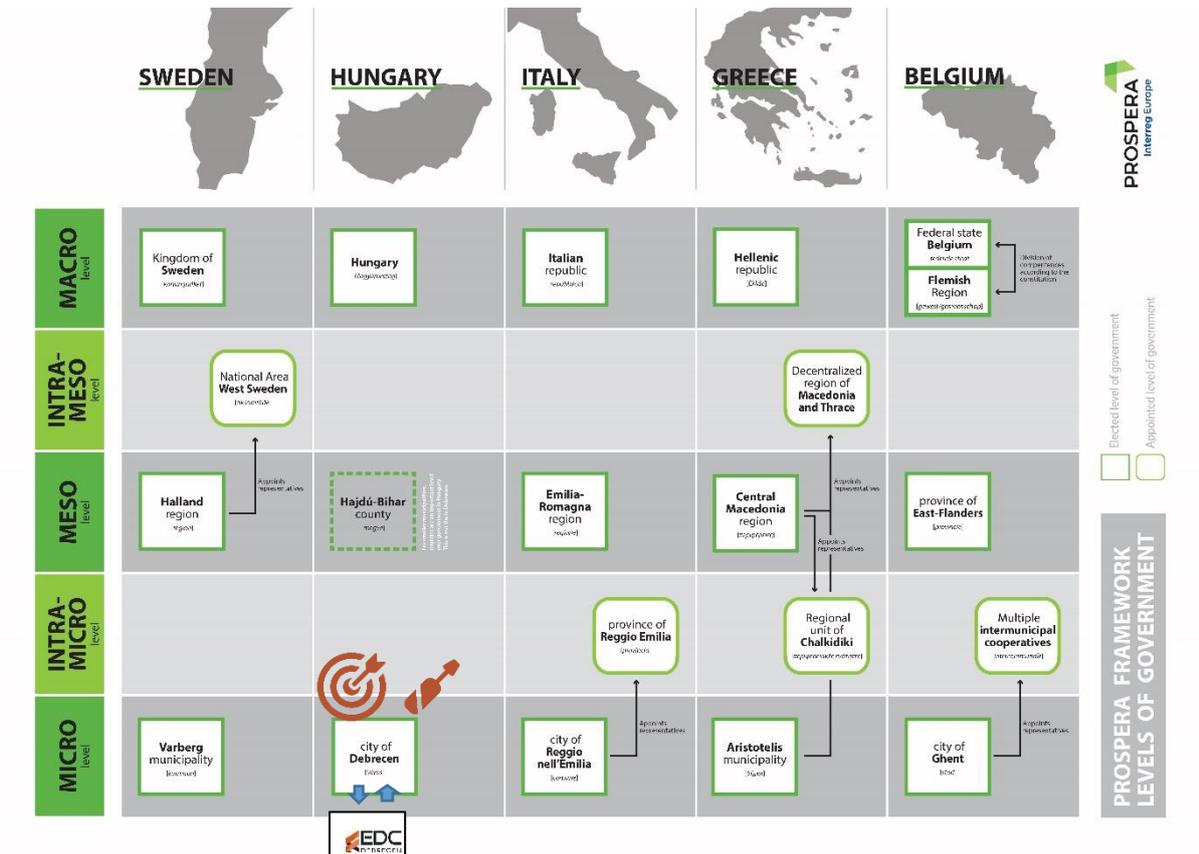


Figure 6 - Framework Levels of government⁶

Governmental context

The scope of objectives of IUDS is determined according to the need of the city, aligned with the national development goals and the European development directions for the period, as mentioned above. Under the national development policy (MACRO level) 10 operational programmes are defined, and EU funds are shared among these programmes.

The next level of government is the MESO level, which is equivalent to Hajdú-Bihar County. The objectives of county level policies are considered, in terms of spatial planning issues, when the development goals of IUDS are defined, but IUDS is an independent policy instrument from legal aspects.

IUDS is developed at MICRO level (Debrecen city), and it is operative within the administrative boundaries of the city.

Position of decision-making and the role of EDC Debrecen

As the owner of the IUDS, the Municipality of Debrecen is the decision-maker regarding the policy instrument. The General Assembly is the strategic decision-making body of the Municipality. The various committees of the Board of Representatives play an important role in the preparation of the decisions of the General Assembly. The third important unit is the Department of Urban Development in the Mayor's Office (participation in the preparation of the medium- and short-term investment programs and plans of the local government; preparation of decisions and concepts necessary for urban and regional development etc.)

The task of preparing and developing the IUDS is delegated to EDC Debrecen Urban and Economic Development Center, which is a non-profit limited company, majorly owned by the Municipality of Debrecen. According to its Deed of Association, EDC Debrecen is responsible, among others, for urban development and planning, and it also carries out the regular revision of IUDS since the objectives and focus of IUDS need to be adjusted to actual challenges.

During the phase of preparing the IUDS, different departments of the Mayor's Office and relevant institutions of the city (e.g. Department of Urban Development; the Chief Architect Office, Chambers, the University of Debrecen) are involved in the planning procedure. The strategy is aligned with the organizations specified in the legislation defining the framework for the elaboration of IUDS (Government Decree 314/2012).

The proposal of IUDS is approved by the city leaders' forum and commented by the Committees before submitting to the General Assembly of the Municipality, which ratifies the final Urban Development Strategy document.

Financial resources and implementation of the IUDS

EU funding will continue to play a key, if not exclusive, role in urban development process in Debrecen city over the next 7-8 years, supplemented by the co-financing of the Hungarian State. In addition, the Municipality also ensures financial resources to the implementations of developments.

Several departments of the Mayor's Office are involved in the implementation of the Urban Development Strategy, which coordinate the professional tasks of the investments.

EDC Debrecen, as a local development agency, takes significant part in the implementation of the measures. The urban development activities of the company include preparation and elaboration of project proposals to be submitted to the calls in the framework of several operational programmes as well as the coordination of the management of the projects carried out to reach the objectives defined in the IUDS.

4.3. The challenges addressed by policy instrument "Integrated Urban Development Strategy"

IUDS is a medium-term strategy that outlines the main development directions for Debrecen (including Structural Funds projects). It includes city-specific objectives determined for the suburbs, defined according to construction and land use criteria. The objectives of the IUDS also determines the themes of the policy instrument. There are two types of objectives: thematic and territorial.

Thematic objectives and their themes with the challenges that the policy instrument wants to address:

R1. 'Improving external and internal transport conditions and the accessibility of the city' – It focuses on **MOBILITY theme** with following challenges:

- increasing number of cars
- parking problems
- development/modernization of public transport
- promoting sustainable mobility
- renovation of roads and sidewalks
- commuting
- improving the interconnections of road infrastructure

R2. 'Development of infrastructure satisfying the needs of competitive economy on an international scale, creation of a business friendly environment' – **ECONOMY theme** with the following challenges:

- few greenfield areas are suitable for industrial sites
- importance of skilled workforce
- motivate inactive population into labour market
- need of investment promotion

R3. 'Development of the infrastructure of the city's higher education system and research institutions, strengthening the practical utilization of scientific results' – **EDUCATION theme** with the following challenges

- growing importance of innovation
- the relationship between business sector and the university needs to be strengthen

R4. 'Improving the conditions of high quality touristic services on an international level, developing the existing facilities' – **TOURISM theme** with the following challenges:

- increasing importance of medical services in tourism sector
- improving the capacity of sport facilities
- finding selling points of the city (including attractions of peri-urban areas)
- promoting natural and cultural heritage

R5 'Protection and Improvement of Built and Natural Environment'– **BUILT ENVIRONMENT theme, NATURAL and CULTURAL HERITAGE themes** with the following challenges:

- management of used thermal water
- extending green spaces in the central inner-urban area
- ensure water supply
- air pollution
- promoting energy efficiency in renovations of buildings
- affordability of housing
- the problem of enclosed gardens

R6. 'Development of the city's public education cultural infrastructure' – **EDUCATION theme, and CULTURAL HERITAGE theme** with the following challenges:

- modernization of public educational buildings
- raising awareness in the field of sustainability

R7. 'Development of social and public health sector – **POPULATION theme, HEALTH theme** with the following challenges:

- capacity expansion
- ageing population

Territorial objectives are based on the different characteristics of neighborhoods. Only V9. 'Outside Neighbourhoods: Improving living conditions of the population and the development of tourism with the preservation of natural environment' refers specifically to peri-urban areas. This objective addresses the following challenges:

- lack of public utilities
- the low number of public services providing institutions
- accessibility of peri-urban areas
- improving tourist attractions
- growing population in peri-urban areas
- lack of green infrastructure in the Western part of the city

In addition, V6. 'Industrial Parks', V7. 'Big Forest' and V10. 'Debrecen Airport' have peri-urban relevance with the following challenges addressed:

V6. Industrial Parks:

- development of South Industrial Site
- improving of the accessibility of industrial sites

V7. 'Big Forest':

- improving recreational functions and the attractiveness of Big Forest
- development of the conditions of health and spa tourism
- ensuring water supply
- invasive species

V10. 'Debrecen Airport':

- development of the infrastructure of the airport
- increase the number of passengers

The IUDS set out the implementation of different projects in order to address the above-mentioned challenges.



Picture 2 - The focus of the selected policy instrument of Debrecen

4.4. Related local policy instruments

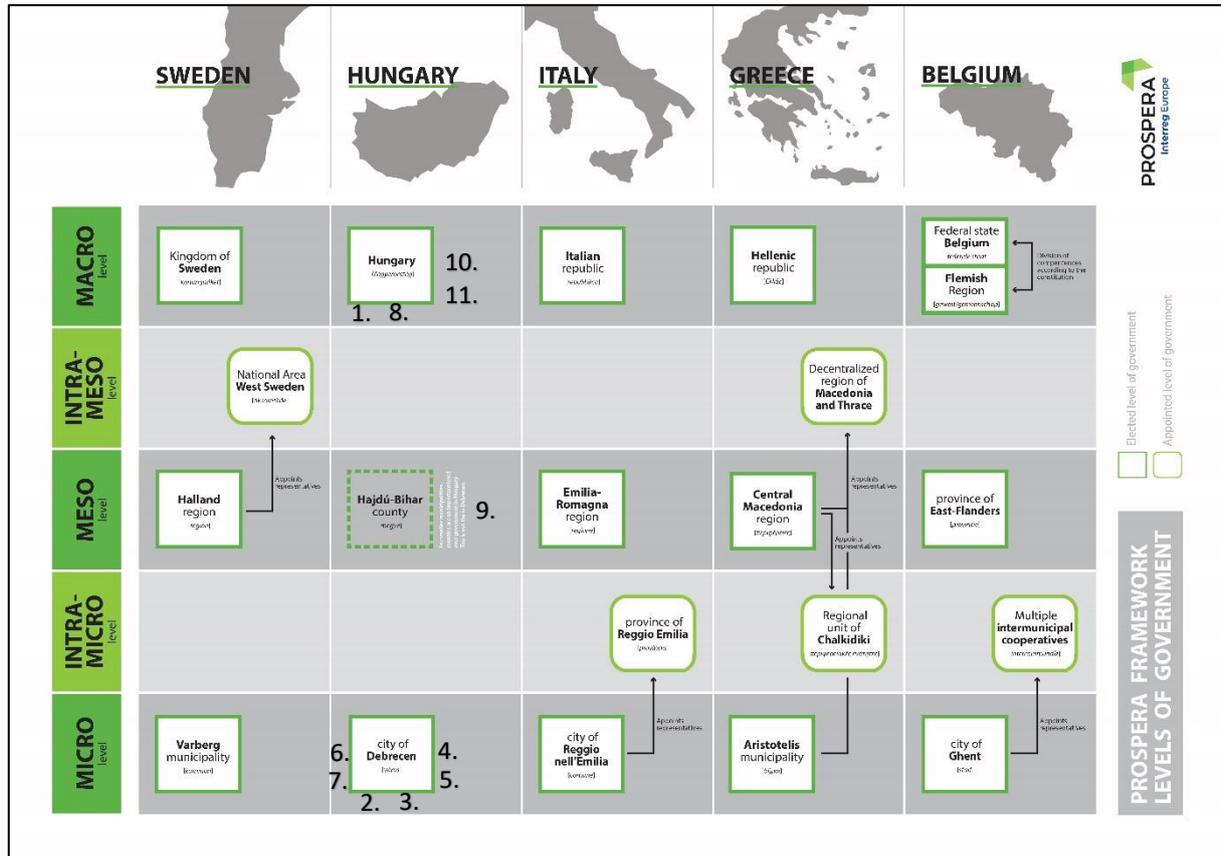


Figure 7: Related PIs indicated in the framework

1. Nemzeti Fenntartható Fejlődési Keretstratégia 2012–2024 – National Sustainable Development Framework Strategy 2012–2024 – This strategy is on national level and there's no territorial focus in it. It sets out challenges and proposals for social (like ageing, shrinking of population etc.) and environmental issues, therefore it has connections with the **Theme Population**.

2. Debrecen településrendezési eszközei- Urban planning tools for Debrecen – The urban planning tools for Debrecen' is a kind a local policy instrument which regulates the structure, landscape of the city. Responsible administration body is the Chief Architect Office of the Municipality. These PI is more oriented issues related to the **Theme Built Environment**.

3. Debrecen Fenntartható Városi Mobilitási Terve – Sustainable Urban Mobility Plan of Debrecen – This PI only focuses **on mobility** theme and defines projects related to mobility. Responsible administration body is the Department of Urban Development of Mayors' Office.

4. Debrecen Smart City Stratégiája – Smart City Strategy of Debrecen – This document has **7 objectives**:

1. Digital literacy
2. City services
3. Energy
4. Public safety

5. Transport
6. Sport
7. Health Services

This strategy addressed multiple themes: **Mobility, Population, Sustainability** etc. thus have common goals with the IUDS. Responsible bodies for this PI are EDC Debrecen Urban and Economic Development Center, and Department of Urban Development of the Mayors' Office.

5. Debrecen Megyei Jogú Város Innovációs Gazdaságfejlesztési Programja 2014-2020 – Program for Innovative Economic Development of Debrecen – This policy instrument is more oriented to specific economic sectors. The program has 3 main themes:

1. Healthcare Industry
2. Agriculture
3. High-added value industries

Responsible body for the PI is the Municipality of Debrecen.

6. Debrecen Megyei Jogú Város Befektetésösztönzési Programja 2015-2020 – Investment Promotion Program of Debrecen 2015-2020 – This instrument is responsible for the promotion of foreign direct investments. The objectives of this Program are based on IUDS. This Program contains a competitive analysis identifying 12 cities in Eastern Central Europe. The program defines tasks for different economic sectors. Responsible bodies for the PI are EDC Debrecen Urban and Economic Development Center, and the Municipality of Debrecen.

7. Debrecen Megyei Jogú Város Önkormányzata 2015-2020 közötti időszakra vonatkozó Gazdasági Programja – Economic Program for Debrecen 2015-2020 – This policy instrument deals primarily with municipal management tasks. The objectives of this document are based on IUDS. The responsible body for this PI is the Department of Organisational Issues of the Mayor's Office.

8. Nemzeti Turizmusfejlesztési Stratégia 2030 – National Tourism Development Strategy 2030 – There is no Strategy for **Tourism** on Micro-level yet. Thus, all the investments in tourism need to fit in with the National Strategy. However, the so-called "Debrecen – Hajdúszoboszló – Hortobágy – Tisza-lake touristic region" is mentioned in the National Tourism Development Strategy. The national strategy has objectives which have linkages with our IUDS:

- A.1. objective: Destination oriented approach and attraction development in a new way, basic-infrastructure development (Attraction development that contributes to natural and cultural heritage management)
- A.4. objective: Improving transport connections (Debrecen International Airport)
- H.4. Tourism that lives together with the natural environment and local inhabitants

Responsible body for this PI is the Hungarian Tourism Agency.

9. Levegőminőségi Terv a Légszennyezettség Javítására Debrecen Környéke Zónacsoport Területén 2014-2020. – Air Quality Plan for the micro-zone of Debrecen 2014-2020 – The AQP only deals with air quality issues thus it has linkages with **Environment theme**. It is important to mention that the AQP of Debrecen includes neighbouring settlements, so this instrument is based on intra-micro level. However, according to Hungarian regulations the administrations which are responsible for preparing these AQPs are Government Offices in cooperation with municipalities. In the case of Debrecen

responsible body is the Governmental Office of Hajdú-Bihar county, Department of Environmental and Nature Protection. Municipalities are responsible for implementing provisions included in AQPs.

10. Debrecen Megyei Jogú Város stratégiai zajtérképére alapuló Intézkedési terve – Strategic Noise Mapping and Action Plan – This PI has linkages with IUDS in terms of transport development. The Action Plan is based on IUDS. According to Hungarian regulations the administration which is responsible for preparing Strategic Noise Plans is Hermann Ottó Institute. Municipalities are responsible for implementing Action Plans based on Strategic Noise Plans.

11. Magyarország Nemzeti Energia- és Klímaterve – National Energy and Climate Plan of Hungary – It's a national development Strategy having a wider scope with no territorial focus. Responsible body for the PI is the Ministry for Innovation and Technology

4.5. The PROSPERA window of opportunity



Picture 3 – Debrecen prioritizing themes (left picture) and focus of policy instrument (right picture)

Joined action field

Mutual ambition of the Integrated Urban Development Strategy of Debrecen and PROSPERA project is:

fostering sustainable development in peri-urban areas while protecting and promoting natural and cultural heritage

IUDS defines the main development directions and areas of the city. Its target system is linked to the focus of PROSPERA project at several points, though it does not deal with peri-urban areas in an integrated manner. The most thematic focus linking to peri-urban areas is strategic goal R5 ('Protection and Improvement of Built and Natural Environment'), but other objectives are also related (R2 'Economic Development' and R4 'Tourism Development').

Economic development plays an essential role in the future of the city. Economy of Debrecen shows a strong development trend with a high demand for industrial sites. In addition, there is a need to develop economic and other ways of land use in compliance with the natural heritage and the local ecosystem. In parallel with the economic growth of the city, it is crucial to involve peri-urban areas in the sustainable urban development processes.

In peri-urban areas mobility is a prioritized economic sector. Sustainable development of mobility is important to ensure appropriate connections between peri-urban areas and inner urban areas.

On the other hand, environmental issues are also of high importance in terms of the development of peri-urban areas, including the protection and promotion of natural and cultural heritage as well as struggling against climate change.

Using the results of the project, Debrecen intends to integrate the aspects of preserving natural and cultural heritage into the objectives and measures of the Strategy, which enables to ensure high-quality ecosystem services through efficient economic development.

Missing links

Related to the objectives of PROSPERA, the missing link where improvements can be made in IUDS is:

including peri-urban areas in strategic planning as key leverage for sustainable growth & attractiveness of the region

There is a strong need to involve peri-urban development aspects in the IUDS in an integrated manner. Besides, there is a real concern about the proper land use, which is not well-known at present in the peri-urban areas, as well as there is no sufficient information available on the conflicts. Therefore, it is crucial to identify and understand the actual land use management as well as the problems and their impacts deriving from land use. Based on this knowledge, best practices and possible solutions need to be explored to tackle the conflicts.

The goals and measures of the Strategy should include directions and criteria for the sustainable use of peri-urban areas in order to ensure the balance between the ecosystem services and the socio-economic development of the city.

5. The Good Practices of the municipality of Debrecen

Good practices of Debrecen, which have proved to be successful in the city and its vicinity and which are of potential interest for other regions, are as follows:

1. Managing UNESCO World Heritage site – The case of Hortobágy

Hortobágy belonged to Debrecen until 1952, when it became an independent settlement. This means that Hortobágy was a part of Debrecen's history, and it is an existing example of the city's rich agricultural traditions.

The Hortobágy National Park – the „Puszta” is an exceptional surviving example of a cultural landscape constituted by a pastoral society and maintains intact and visible traces of its traditional land-use forms over several thousand years and illustrates the harmonious interaction between people and nature. This outstanding universal value was acknowledged by UNESCO in 1999 with inscription of the site in the World Heritage List. The Hortobágy is one of the largest alkaline grasslands in Europe, which has several cultural and natural values. Managing/maintaining these values and tourist attractions will contribute to natural heritage protection and to promote regional attractiveness.

Tourist attractions which can be shown as good practices:

- Hortobágy Wild Animal Park and Puszta Animal Park

- Hortobágy Great Fishponds and Narrow Gauge Railway
- Nature Trails
- Dark Sky Park
- Inns (in Hungarian it is called “csárdák”)

Activities which can be shown as good practices:

- Bird hospital
- Hortobágy Equestrian Days
- Gene Preservation of domestic animals (Hortobágy)
- Environmental Education programs
- Bird watching
- Bridge-fair (Gathering of herdsmen, animal market, traditional crafts)
- Product Trademark by the National Park (it proves that the product is produced locally)

This good practice demonstrates the management of different kinds of attractions of a UNESCO World Heritage Site. On the one hand, Hortobágy **has several natural values** thanks to its natural grasslands, loess ridges, alkaline pastures, meadows and smaller and larger wetlands. On the other hand, these conditions were ideal for pastoralism and appearance of large animal-breeding cultures thus **Hortobágy is considered as a cultural landscape.**

Building on its traditions and natural values, the aim of the practice is to show how to manage a World Heritage site in a way that:

- 1) attracts tourists
- 2) preserves and promotes cultural and natural heritage
- 3) does not harm the eco-system
- 4) organizes environmental education programs
- 5) strengthen urban-rural linkages by presenting pastoral lifestyle and domestic animals and producing handmade crafts

Core elements of the success:

Managing/maintaining natural and cultural values as well as tourist attractions in its complexity, in an integrated way, can contribute to a successful natural and cultural heritage protection and to promote regional attractiveness.

Further information on this Good Practice (URL):

<http://www.hnp.hu/en>

http://www.hnp.hu/uploads/files/turizmus/VIL%C3%81G%C3%96R%C3%96KS%C3%89G/Outstanding%20Universal%20Value_HNP.pdf

http://web.axelero.hu/pusztadr/e_alapitvany.html

2. Establishment of modular and vertical green-walls

This good practice from Parkertech Ltd. company, a member of EDC Debrecen’s stakeholder group, demonstrates a project-oriented approach in planning/designing and implementation/planting.

Large buildings located in the inner urban areas of Debrecen have large, vertical surfaces which are ideal places for green walls. Establishing a green wall is a good way to increase green spaces in the inner urban areas. They have several functions:

- 1) to reduce the temperature of buildings
- 2) increase the green spaces and biodiversity in urban areas
- 3) in vertical green walls circulating water less likely to evaporate than in horizontal gardens
- 4) remediation of poor air quality, and purifying the air
- 5) reducing heat-island effect

The construction of the new bath and spa centre of the city is in progress. It is an on-going project that will be finished by the end of May 2020. Video of the construction that shows the green walls: <https://dailynewshungary.com/here-is-debrecens-insane-futuristic-thermal-park-video/>

Location: In the new bath and spa centre of the city. Address: 4032 Debrecen, Nagyerdei Park 1.

Core elements of the success are:

- 1) The company located in the peri-urban area runs a successful business in the field of creating new green spaces for inner urban areas.
- 2) Plants are pre-grown and designed in the peri-urban area then they will be placed in the inner-urban areas.

Further information on this Good Practice (URL):

<https://dailynewshungary.com/here-is-debrecens-insane-futuristic-thermal-park-video/>

<http://www.parkertech.hu/>

3. Creating a GIS system which is based on modern remote sensing methods and satellite data

This GIS system contributes to get an accurate picture of the state of green areas, urban spatial structure, building density, road networks etc. of the peri-urban area of a city. Time series analysis of satellite data show us how the urban structure of a given area, the proportion of built-in and green areas have changed over time, thus we can identify trends.

Having such a database which integrates existing city development and urban management data can provide an accurate picture of the values of peri-urban areas and economic activities there as well. These data are important to set the goals of a sustainable development strategy.

Modern remote sensing techniques allow us to create images of large areas in a short space of time, which can be processed and evaluated to provide a more accurate picture of peri-urban areas. Thanks to this comprehensive method we can set development goals more precisely.

The technology and know-how are available locally at EnviroSense Hungary Ltd. and Remote Sensing Centre of the University of Debrecen.

Core elements of the success:

- 1) Data-driven, modern technology
- 2) Skilled experts
- 3) Partnership between the company and the Remote Sensing Centre of the University of Debrecen

4) Existing GIS systems in major Hungarian cities

Further information on this Good Practice (URL):

<https://envirosense.hu/>

4. Matura and Natura Foundation

Matura and Natura Foundation (Matura és Natura Alapítvány) was founded 20 years ago in Debrecen. It is a public benefit foundation, aiming at environment and nature protection, environmental education and the dissemination of scientific knowledge. In 2014 the foundation established the so-called Nature Archive (Természettár) which is a scientific exhibition. This kind of exhibition has not existed in Debrecen before, so it definitely filled a gap. In recent years, the foundation has held a lot of classes and lectures, summer camps, a significant part of them are related to the curriculum, but at the same time they make it more experiential and easier to learn. In addition, through their community building activities participants can learn about nature and endangering problems. The goal of the foundation is to develop experiential knowledge and to develop and maintain a conscious nature conservation approach.

During summer breaks they hold nature camps where students can observe the wonders of nature. Last year more than 3000 students attended these nature camps.

Their role in the virtual world (Facebook) is very significant, they publish educational contents. These contents often used for educational purposes by teachers and student society at national level. The number of followers of their Facebook page is more than 150 000 (!).

They had an online poster campaign called 'Protect nature with us' resulting in 2 million reaches.

Aims:

In order to improve regional policies on protection and promotion of natural heritage by tackling loss of ecosystem services it is very important to engage residents. The aim of the practice is to show how a foundation can contribute to nature protection and conservation through raising awareness campaigns, educational activities.

Core elements of the success:

Due to educational activities, summer camps, lectures inhabitants get engaged with the preservation of biodiversity and get to know the natural values of Debrecen. Outdoor walks and events can contribute to raise the attention of the inhabitants of Debrecen in the topics of nature preservation, domestic species etc.

Further information on this Good Practice (URL):

<https://www.facebook.com/Term%C3%A9szett%C3%A1r-145815242208315>

5. Zsuzsi narrow gauge railway system

The Zsuzsi railway system was built more than 130 years ago. First it was used as a railway system for timber transporting, then for commuting from the peri-urban areas to Debrecen. Later (from 1980's), the railway system became a tourist attraction – during the communist era it was called Pioneer's Railway (according to the communist Pioneer movement). After the fall of communism, the improving of the existing infrastructure became crucial. The railway nowadays is operated by a non-profit corporation and owned by the Municipality. **The railway now is used for awareness-raising purposes among the visitors (primarily for young pupils) in order to draw their attention to the natural values of Debrecen's woodlands.** Around the terminus station new infrastructure elements were built in the last 10 years: the House Of Nature & Observatory, a look-out tower, an educational path in the forest, open-air stage etc. **thus the surroundings of the terminus station has become an eco-touristic centre for visitors.**

Aim:

On the one hand the aim of the operator is to promote and develop the natural heritage of Debrecen. On the other hand, the terminus station is a center for tourism thus the regional attractiveness of the peri-urban is another objective.

The whole railway system is **a good practice for transforming an existing brown infrastructure to another type of using, in this case for (eco-)tourism.**

In addition, **the whole railway system is the oldest still-operating narrow gauge railway system in Hungary so it's a cultural heritage** that is protected by national law. In this sense the railway system **combines cultural heritage preservation with promoting and developing the natural heritage of the city. Moreover, awareness-raising among visitors is a very important element.**

Location: The railway line and the terminus station lie in the administrative border of the city of Debrecen. The train departs from the inner urban area and goes out to the peri-urban area. The terminus station is located in the woodlands of „Erdőspuszta” („Erdőspuszta” is the name of the woodlands that located in the Eastern part of the city's territory). The length of the whole line is 17 kms.

The railway line is **owned by the Municipality of Debrecen.** The **Operator of the railway system is a nonprofit** corporate (ZSUZSI Erdei Vasút Nonprofit Corporate).

Core elements of the success:

- 1) **Cultural heritage:** the oldest narrow-gauge railway system in Hungary
- 2) **Natural heritage:** the railway line crosses a woodland area called “Erdőspuszták”
- 3) **Tourist centre in the middle of the forest:** the terminus station is located in the middle of the forest. Visitors can find: look-out tower, the House of Nature&Observatory, a fish pond, playgrounds, Forest School in the surrounding area.
- 4) **Raising-awareness:** most of the visitors are young pupils from elementary schools of Debrecen.

Further information on this Good Practice (URL):

<https://www.debrecen.hu/en/tourist/articles/zsuzsi-narrow-gauge-railway>

<http://zsuzsivasut.hu/nyelv/en> (in Hungarian only)

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