2 RURAL AREAS IN A CHANGING WORLD – GEOGRAPHICAL ANALYSIS OF THE RESEARCH AREA

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2.1 Introduction: definition of the rural areas

In this chapter, we will summarize the most important viewpoints of a complex term rurality based on the literature. Then we will analyze the research area recent environmental and socio-economic situation with the help of quantifiable indicators.

The function and image of rural areas have undergone huge changes in the last 50 years. The traditional role of a village has been formed by processes like modern agricultural mass production, changed market relationships, suburbanization and the formation process of peripheries (ageing, depopulation). The biggest problem, according to the researchers reporting on this topic (Csatári, 2011), are the processes which were not foreseeable in the region; the depreciation of the countryside and decrease of the bearing capacity, which contributed to many negative trends, like social, economic and environmental problems. To review the concept, we have two different conceptions evident from the literature. In the first case, the concept of rurality is defined by quantifiable, objective numbers. In the second case, the existence of rurality, countryside and "separate quality" from the urban areas was questioned. The definition can be changed so researchers use geographical, social, economic or cultural indicators (Maácz, 2001). In the European Union, problems related to the special developmental need of the rural areas originate from the late 1980s (EC, 1988). The European Charter for Rural Areas (1996) adopted by the Council of Europe, defined the rural areas as territories where agriculture, forestry and fishing mainly appear, population has special economic, cultural activity, recreation, environmental protection and the postmodern way of life related to the social needs is also highlighted. The novelty of the definition comes from the rural = "not urban" wording (Arcaini et al., 1999). The European Spatial Development Perspective (EC, 1999) consider rural areas as complex economic-environmental-cultural territories which do not make a homogenous unit. It can be characterized by different limiting factors. Understanding urban-rural areas helped the studies under the ESPON 1.1.2. project. The research drew attention to the importance of connections and their intensity and direction, namely structural (land use, settlements system) and the differences between functional connections (production-consumption-communication formations). The European Union does

not apply a unified capped system for rural areas; however, every member state has its own system based on some other socio-economic characteristic. It takes into account the settlement system, land use, economic functions but the most accepted indicator is population density. That being said, the method of OECD (1994), which uses population density to distinguish between rural and urban areas, is of vital importance. The method of OECD uses a two-step evaluation of a territorial level - on a local level (LAU2-settlements) where a threshold number of rural settlements are under 150 inhabitants/km^2 and on a regional level (NUTS3), the proportion, which shows the given administrative or functional unit proportion of inhabitants who live in rural areas, is used. The three basic types are predominantly rural areas, where the proportion of inhabitants living in rural areas is more than 50%, typically rural areas (intermediate), where the number of inhabitants living in rural areas is between 15% and 50% and predominantly urban areas, where the proportion of inhabitants living in urban areas is less than 15% (Eurostat, 2007). In 2010, with the help of new methods and GIS systems[1], the rural typology has been clarified. The new method takes into account the variable spatial sizes and the problem of metropolitan areas. 56% of the European Union territory is predominantly a rural area; in the case of Hungary, 66.1% of the country is a rural area and 47.9% of inhabitants live in rural areas. In Croatia, the numbers are different - 26% of the country is a rural area and 53.4% of the inhabitants live in rural areas. The Hungarian concept of rurality was first used in the law No 21/1996 (National Agrarian Structure and Rural Development) where rural areas were distinguished from the terms of agricultural, less developed regions and villages. Researchers, like Kovács (1998), used a different approach with the following main indicators of rural areas - the proportion of active workers working in the agriculture in 1990 was more than 20%; a minimum of 120 primary users per thousand people; a minimum of the population living in settlements with less than 120 people/km^2; the population density less than 80 people/km^2 in the region.

According to the Ministry of Agriculture (1997), a rural area is a place where the agricultural activity, green cover (forest, natural landscape) and settlements system are mainly dominant in small villages with the specific low rate of built-up areas and population density. Dorgai (1999) says that settlements are rural areas which do not have an urban status with residential population being less than 10,000 and dwellers of the rural settlements proportion being more than 15 %.

Csatári (2000) attempts to rank the Hungarian small districts according to the urban/rural index. Those small districts are rural areas with the given territory being less than 50% and with the population of more than 120 people/km^2. Kovács et al. (2015) specify eight complex types of rural districts (in the Rural Development Program 3.0 assessment). Németh and the colleagues (Németh, 2011; Németh et

[1] http://ec.europa.eu/eurostat/documents/35209/35256/Urban_rural_poster_3levels_A1_Aug2013.pdf

al., 2018a) tried to simplify the notions. In their environmental and socially focused approach, they argue that rural areas are places where people can be in harmony with the nature. Settlements have to take their special peculiarities in their development concepts in order to fulfil the three E criteria of sustainability into consideration.

To summarize, the term of the rural region, based on the examples from the literature, cannot be defined by population density and the number of dwellers; however, it can be categorized with the help of these quantifiable factors.

2.2 Introduction to the research area – overview of the administrative, environmental and historical background of the cross-border region

The research area consists of three NUTS 3 level territorial units at two sides of the non-official Hungarian-Croatian cross-border region. Two are located in Hungary (Baranya, Somogy counties) and one in Croatia (Osijek-Baranja). All units occupy less than 10% of the countries' total area (EUROSTAT 2018).

Historical changes, hand in hand with environmental factors, have played an important role in the recent socio-economic situation. In this section, we highlighted the milestones about the territory's history. In the Roman times, Danube River was a military objective (parts of the limes-system had been built alongside the river) with settlements with military function. Later on, the Hungarian conquest led to prosperous agriculture and increasing population. The first significant depopulation started due to outer causes – after the Ottoman Empire, these settlements were destroyed and their infrastructure was demolished. In these times, the area was a border region between two large empires. Later, in the 17th century, immigration had started so a huge number of Swabian people arrived in South Transdanubia and Slavonia, which contributed to the multi-ethnic characteristics of the area. In the middle of the 19th century, the rail network took over the role of the rivers as it had become the primary and most effective way of transportation, which also affects the settlement system. After 1920, there was a large change of the development of the area - the Austro-Hungarian Monarchy collapsed and the recent territories of Osijek-Baranja had become the part of the Serbian-Croatian-Slovenian Kingdom (after 1929, it is known as Yugoslavia). After the Second World War, both sides of the border were part of communist systems but with differences.

Figure 2.1. The area (km²) and location of the counties
Source: Own contribution.

In its internal relations, structures similar to other socialist states were dominant in many respects, but the birth of Yugoslav self-managing socialism endowed the country with unique features. Unlike most other socialist countries, Yugoslavia continuously remained open to the West in several respects. The conditions of organised emigration and mass employment abroad were gradually created (Hajdú, 2013: 494).

The country developed its relations to the European Economic Community (EEC) from the mid-1960s on. In economic relations, the EEC became the most

important trade partner for Yugoslavia, and in the framework of these relations the country was given development resources as well (Hajdú, 2013:494).

The transforming European Union, redefining itself in many respects, played a significant role from 1992 on in supporting Croatia and Slovenia and in establishing their international relations. In the transformation processes of the other ex-Yugoslav states, especially in Bosnia and Herzegovina, the EU failed to help these processes. It was the UNO, the NATO and the USA that became the major actors in solving the problems there. The EU contributed to stabilisation in the fields of finance and development (Hajdú, 2013: 495).

Hungary in 1990 and Croatia in 1991 declared their independence but in the case of Croatia, the transition was more forceful because the war of independence was started. After that, in 1993, the recent administrative units and counties were born. Nearly two decades of the 21st century, both sides of the border have become the part of the European Union with better communication possibilities, interregional projects and without strict border control.

The studied cross-border area is a belt stretching along both sides of the lower part of Mura, Drava Rivers and the Danube above the Drava firth. Partly due to the following reasons, this area is ecologically the most unified, organic and continuous river-system with green-belt. Recently, this area has also been called the "Amazon of Europe". Based on this, from the 1990's there was an increasing "meta-governing" need for a common nature protection area/Nature Park that joins the natural values of Croatia, Hungary and Serbia (Varjú, 2016:85).

As we focus on the environmental factors, one of the most important characteristics of the research area is the basin effect. The territory lies in the Pannonian Basin, which influences a wide range of other conditions as well, such as climate or hydrology. In the area, the dominant landscape is plain, primarily in the middle and South parts, where the Hungarian Great Plain lies. Somogy county is mainly covered by shifting sand (Martonné, 2006); however, the largest parts in the research area are alluvium plains; on the Croatian side, Drava (and its valley) is one of the most important tributaries of the Danube River. The counties' climate is temperate continental (according to Köppen climate classification) with Sub-Mediterranean influence in the south. Looking at the climate graphs, we cannot find significant differences between the three counties because of the small size and relatively small horizontal (latitude) and vertical (altitude) changes. In general, the highest amount of precipitation falls in summer months and there is a second peak in late autumn because of the Mediterranean effect. The amount of the annual sunshine hours varies between 1,800 and 2,000. The annual average temperature is 10-11°C, which varies according to the elevation. Similarities continue; both counties' coldest month is January and the warmest July. The annual precipitation is between 600-700 mm but it has annual

changes. North Baranya has the highest amount of the precipitation – 750-800 mm. Both parts have convective precipitation in late spring-early summer, which can lead to flash floods in the mountainous areas, especially in the Mecsek Mountains.

Location, climate and the basic effect determine the drainage system as well; the whole area belongs to the Danube's catchment area. In hillier places, like Mecsek or the southwest part of Osijek-Baranja, brown forest soils can be found. These humid places with lower temperature created medium quality soils. The most fertile ones are located in the bedrock of quaternary loess, mainly in the outer Somogy, are chernozemic soils, which are the most valuable types of the basin's soils (Martonné, 2006).

Taking into account the natural conditions from the point of view of environmental planning, being a border river, the Drava cuts the area into a Hungarian and a Croatian part. Along the Drava River, both sides of the border area are historically peripheral, characterized by poor economic performance. Between 1920 and the end of the 1980's the Drava-region was almost perfectly closed. During the Soviet era both countries were subject to socialist ideology, however, former Yugoslavia was not part of the Soviet ascendancy area. Because of the very strict border guarding only local citizens or a person with permission could approach the border area, including villages nearby the border. The whole area had a very unfavourable position in terms of investment due to the geopolitical risks on the Hungarian side and the Yugoslavian civil war in the 1990's. In the past 25 years the trajectory of the development of this cross-border area differed from other parts of "the mother-countries". On the Croatian part "while the coastal areas and the metropolitan region (Central Croatia) went through an expansion, Slavonia, the Eastern part of the country, is clearly a loser of the same transformations" (Rácz, 2016; Varjú et al., 2014, Varjú, 2016:86).

The concept of Drava, as energy resource, appeared during the 19th century already, during the era of Austria-Hungary Monarchy. Several, more than 20, hydroelectric power plants were built on the upper part of the river. There were several concepts to build a hydroelectric station in the border region of Hungary and Yugoslavia (Croatian part), however an intergovernmental negotiation was achieved only at the end of the socialist era, in 1988, when Hungary and former Yugoslavia signed an agreement to build a power plant on the Drava near Djurdevac. After the (Hungarian) systemic change, (and in parallel with the big debate on the planned Gabčíkovo–Nagymaros dams on the Danube) Hungary turned towards an environmental related direction. Due to this turn, Croatia decided to build a power plant in Novo Virje, instead of Djurdevac. The negotiation and debate between the two countries (hydroelectric power station vs. nature protection and environmental interests) took until the middle of 2000's, once Croatia turned towards the EU. Negotiations for the accession started in 2005 and due this process, environmental issues and environmental sustainability came to the forefront in Croatia as well (Reményik, 2008; Cvritla, 2000; Bali,

2012). Croatia turned to an environmental-related direction, however, plans relating to hydroelectric power stations appeared from time to time, recently as well. Due to the above historical reasons natural assets remained in a good state, especially on the Hungarian side. From the 1990s high attention has been drawn to natural protection in this area. On the Croatian side Kopački rit was designated on the List of Ramsar areas in 1993. On the Hungarian side Danube-Drava National Park (and Directorate) was established in 1996 in order to pay high attention on the natural heritage. This nature conservation area is the largest protected area of national importance in the region. Wetlands are ex-lege protected, waters are continuously monitored under the umbrella of the European Water Framework Directive (EC 2000/60). Not only is the Drava under national natural protection for-and-aft on the Hungarian side. Almost 20% of the study area is NATURA 2000 area, 6.6% is under high national protection and 1.1% is under strict national protection totally closed from the public (Varjú et al., 2014, Varjú 2016:86-87).

2.3 Vulnerable places in a changing world – socio-economic indicators of the research area

Recent, interconnected like globalization, the post-industrial society or the dominance of the tertiary sector have significant spatial effects which led to an intensified concentration of metropolitan areas. These trends can be observed in the whole parts of the world but in the Eastern Europe, there is another crucial factor – the general decline of the population at the national level (Ubarevičienė, Van Ham, 2017), which affects regional development and almost all hierarchy of the settlement system (Makkai et al. 2017). As a result, these rural areas lost their competitiveness and declining which can be measured by quantitative (population drop, age structure, education level) and less quantifiable factors like its image or liveability. Based on these statements, rural places are highly vulnerable to changes and recent, large-scale problems like climate change or loss of the biodiversity. Therefore, these areas easily turn into "no-places", which refer to the attitude of habitats, companies or developers who say no and turn away from rural areas with the tool of outmigration or relocation. In the case of the research area, rural places are located far from metropolitan areas especially the largest ones, Budapest or Zagreb, with disadvantageous transport situation, which help these negative trends to emerge. In this part, we use indicators from Hungarian and Croatian censuses to highlight these processes with the help of different indicators.

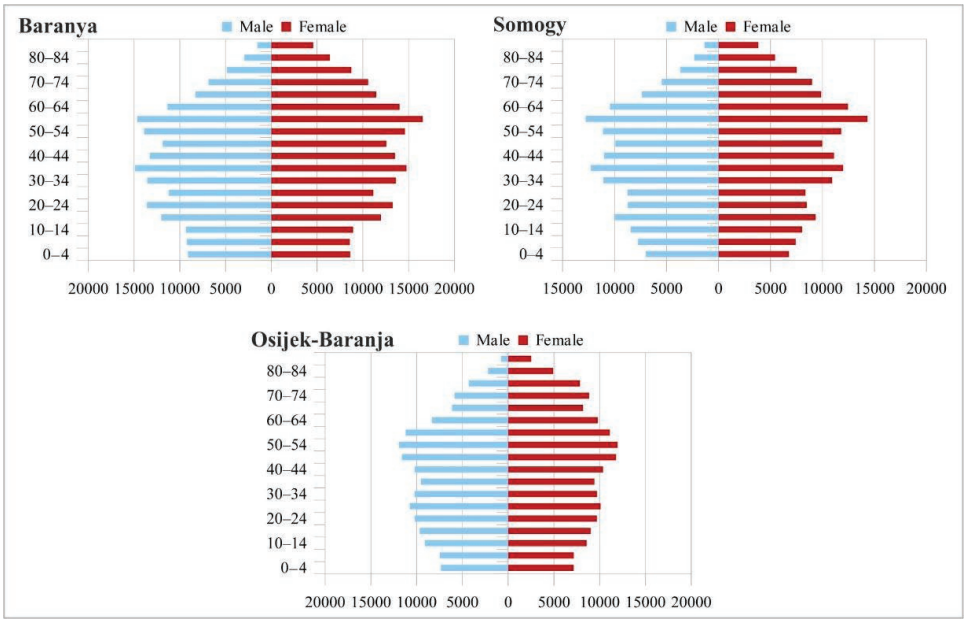

Figure 2.2. Population pyramids of each county
Source: Own contribution based on the data of the Hungarian and Croatian Statistical Offices (KSH, Državni zavod za statistiku - 2011)

Firstly, we examine the counties' population pyramids, which present the structure of the population by age and sex and the changes and past tendencies of the territory's society as well. As the charts show, the birth rates are low caused by low fertility rates as presented in figure 2.2. On the top of the pyramid, there is a high proportion of persons above 65 years and they are characterized by a rectangular shape. To conclude, these counties are in the fourth and fifth stage of the Demographic Transition Model as well as Hungary and Croatia. Historical changes in Hungarian counties, also depicted from the charts, have larger peaks, which refer to periods when the birth rates were higher mostly by the influence of family policy. In the Croatian pyramid, there are only two; smaller waves and columns, which refer to the lower number of population. The natural change in itself is not sufficient for the whole picture; migration also influences the area population. In the case of the RURES territory, there is a small scale of outmigration (e.g. in 2016, 646 people from Baranya migrated out from the county according to the census). As widely-known, primarily the young and well-educated males make the groups who take part in domestic or international migration, therefore the local society lost people who are in the labour market, which has a negative multiplier effect for the local economic situation.

2.3.1 Long-term effects of population decline on RES

The structure of the population has numerous future consequences like the increasing dependency ratio on active population (age between 15-65). In the case of the RURES project, population decline will cause possible long-term effects due to the socio-economic background of implementing and using new kind of technologies. Table 2.1 summarizes the possible environmental, social and economic challenges of the research area. According to that, there are several both negative and positive effects. The environmental pressure will decrease so the preservation of the resources can continue more successfully alongside with the regulation. In contrast, the loss of younger, well-educated people means that learning and maintaining new technologies can be more challenging; the studies found that younger people are more likely to accept new technologies, which connected to renewable resources (Devine-Wright, 2007). At the same time, the environmental pressure will decrease and scarcity means a new type of tourism advantages against the crowded and polluted metropolitan areas. The technological change can allow people to commute less and work and contact with those areas from villages as well.

Table 2.1. Long-term effects of population decline

<table>
<tr><th></th><th>Environmental</th><th>Social</th><th>Economic</th></tr>
<tr><td rowspan="3">Positive Effects</td><td>Fewer people will ease the pressure on the environment (e.g. pollution)</td><td rowspan="3">RES systems will help elderly people who are not in the labor market</td><td>New type of services appears</td></tr>
<tr><td>Carrying capacity will be better</td><td rowspan="2">Better circumstances for rural tourism</td></tr>
<tr><td>Elderly people consume and travel less, so they have a smaller ecological footprint</td></tr>
<tr><td rowspan="3">Negative Effects</td><td rowspan="3">Changing land use patterns</td><td>Elderly people are less likely to adopt new, unfamiliar technologies it so it will be hard to find suitable staff for RES technologies</td><td rowspan="3">Fewer active workers pay less local taxes, labour insufficiency, maintaining infrastructure will be costlier</td></tr>
<tr><td>Public support for elderly people means less expense for maintaining RES systems</td></tr>
<tr><td>Growing number of pensions will increase the pressure on active workers of the territory</td></tr>
</table>

Source: Own contribution

2.3.2 Spatial patterns – settlement system and internal patterns

After general trends, we narrow our focus and examine the research territory internal patterns. As figure 2.3 illustrates, there is a significant difference between the territorial units comparing Croatia and Hungary, which make the comparison more difficult. Metropolitan areas are rarely found in these counties and the largest concentrations are Pécs (144,000 inhabitants) and Osijek (108,000 inhabitants). In Hungarian counties, especially in Baranya county, there is a lack of middle-sized towns except for Komló. As the second maps illustrates, the settlements are under 1,000 inhabitants, except the surroundings of Pécs because of the suburbanization process and urban sprawl. In Somogy, the settlement system is more balanced as the number of small towns and the proportion of larger villages is higher. Despite this, this county has the lowest population density in Hungary (52 person/km^2).

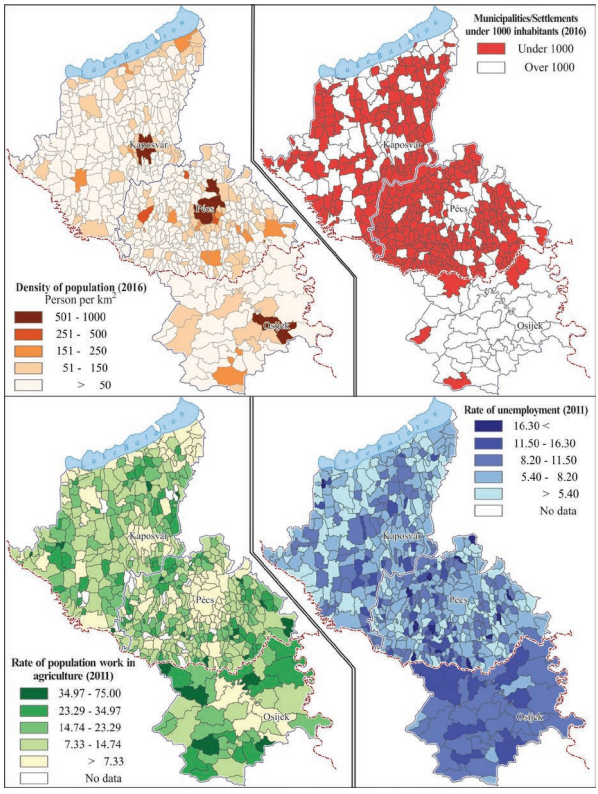

Figure 2.3. Spatial patterns of the research territory's population, settlements and socio-economic indicators

Source: Own contribution based on the data of the Hungarian and Croatian Statistical Offices (KSH, Državni zavod za statistiku – 2011, 2016)

Based on the data of population by age, the late stages of the demographic transition model, the low rate of young people (under 14 years old), which is between 5-10%, is evident. Ormánság in Baranya is one of the part of the territory where this number is the highest. In the Croatian part, the youngest municipalities are in the south parts. In contrast, the proportion of the old population who are inactive workers and are not in the labor market can be found mainly in Somogy, near Lake Balaton, which is a conurbation, and in the north part of Osijek-Baranja. The age structure of Pécs refers to the outmigration; it cannot hold its young population despite the university city status. According to the statistical data, Pécs has the most significant highly-skilled inhabitants in the research territory. If we examine this indicator in the county level, Osijek-Baranja has the highest ratio. Other cities like Kaposvár or the towns, encircling Lake Balaton, also have higher numbers. Rural areas, as a result of the migration and the decline of the primary sector's economic role, have disadvantageous values; the worst ratio taking place in Ormánság. As the next indicator on the map shows, the unemployment rate is highly connected to the settlement size (we use the data from 2011 census). The most economically vulnerable places are inner peripheries, encircling Pécs in Baranya, and in Osijek-Baranja located near to the border.

Comparing the two sides of the situation of the two countries, in Croatia, the agriculture plays a more important role than in Hungary with respect to the employment rate (Croatia: 14.57%, Hungary: 4.89%), which has mainly historical reasons. The ratio of people who are working in the secondary sector is nearly the same in every county, but in the case of service sector differences, it also occurs between the two countries. In the county level, these trends can be observed in a smaller scale; Baranya county has the lowest rate of active people working in agriculture (6%) and this number is nearly 10% in Osijek-Baranja county. As the left map points, the proportion of inhabitants working in the primary sector is the highest in the border region. The tertiary sector is one of the important indicators of economic growth; in the research area, Baranya has the highest proportion of the service sector (68%) because of the university status. Despite the importance of this sector, the city is highly dependent on their education institutions due to the lack of transnational companies.