IS THE ROMANIAN DANUBE VALLEY A COHESIVE REGION?
A GEOGRAPHICAL APPROACH

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Abstract. The Romanian sector of the Danube Valley covers a large area in which the life of resident communities is shaped by the River (1,075 km long). At present, 266 local administrative units (LAU) in the Romanian Danube Valley number 238 communes, 28 towns and a population of 1.7 million inhabitants. According to the population structure, 58% of the total population is urban. The current paper is seeking to indentify disparities in the territorial cohesion of the Romanian Danube Valley following several research stages: selecting relevant statistical indicators, analysing territorial disparities, standardising the absolute values of the indicators and grouping elementary indicators into 3 secondary indexes in order to reflect the main aspects of territorial cohesion: life, environmental, and social quality. Finally, the authors were able to compute the Territorial Cohesion Index (TCI), revealing the levels of territorial cohesion. Generally, the outcome of the current study shows a higher territorial cohesion in the urban LAU economically developed that have a high demographic potential.

1. INTRODUCTION

According to Faludi (2004), the initial focus of the Territorial Cohesion idea was on regional economic development. The same author claims that the roots of this concept are to be found in the French expression '*Aménagement du Territoires*', and that there is a decisive French political influence in including this dimension of cohesion in the EU political agenda in order to support the European Model of Society.

In the Barca Report (2009), which advocates for integrating territorial development policies, Coherent Europe is about territorial cohesion creating added value by packaging policies in such a way as to suit the territory concerned (Faludi, 2013).

The concept of Territorial Cohesion was first mentioned in Europe in 1995 in a report on 'Regions and Territories in Europe' published by the Association of European Regions. That report underlined the need for coordinated planning at European level to argument complementariness between territorial and economic-social cohesion as an EU central task (Traşcă *et al.*, 2013). Territorial cohesion appeared in the European Commission's triennial reports; first in 2001 in the Second Report on Economic and Social Cohesion (Commission of the European Communities, 2001), which used the concept to describe the uneven development of the EU territory and particularly the concentration of population and economic activity in the core area of Europe (Commission of the European Communities, 1999); and later, in 2004, when the concept was given prominence by its inclusion in the Third Report on Economic and Social Cohesion (Commission of the European Communities, 2004)(quoted by Davoudi, 2005).

The Territorial Cohesion concept, disseminated by the Green Paper, has in view the harmonious development of all regions, giving the population the opportunity to use the resources of the respective

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area. In this way, cohesion represents a tool of turning diversity into an asset liable to contributing to the sustainable development of the whole European Union (European Commission, 2008).

According to Waterhout (2008), three 'storylines' related to territorial cohesion were identified, not explicitly concerned with territory as such, but rather with the substantive goals of territorial development: 'Europe in Balance', 'Competitive Europe', and 'Clean and Green Europe' (Faludi, 2013).

The European Constitution defines territorial cohesion as a competence shared between the Union and the Member States (Faludi, 2006). Territorial cohesion is a set of principles for harmonious, balanced, efficient, sustainable territorial development. It enables equal opportunities for citizens and enterprises, wherever they are located, to make the most of their territorial potentials. Territorial cohesion reinforces the principle of solidarity to promote convergence between the economies of better-off territories and those where development is lagging behind. The policy of Cohesion represents the essential framework within which EU can approach territorial development challenges and contribute to releasing the local, regional, national and transnational territorial potential (European Union, 2011). Highlighting Europe's territorial diversity, territorial cohesion is aimed at turning this diversity into an asset benefitting all the inhabitants of all regions, securing thereby a harmonious and balanced territorial development capable to contribute to a sustainable Europe (Dao *et al.*, 2011).

In the Lisbon Treaty, among the crucial implications of the inclusion of territorial cohesion for the future of a cohesion and development policy in Europe, a relevant role is played by the fact that Member States and EU institutions, now share competence in contributing to territorial cohesion, as clearly stated in the Territorial Agenda of the European Union 2020 (HU Presidency, 2011, quoted by Cotella 2012).

The Policy of Cohesion is part of the Europe 2020 Strategy with strong emphasis on labour employment, innovation, sustainability, reduction of poverty and social exclusion. Once territorial cohesion was introduced in the Lisbon Treaty as explicit target of the policy of cohesion, the emphasis fell on services accessibility, functional geography, territorial analysis and sustainability. Between 2010 and 2012, the Policy of Cohesion was focused on one of the eleven key-thematic goals set for the 2014–2020 interval. The EU Cohesion Policy is aimed at implementing a coherent investment policy in order to meet the Europe 2020 Strategy targets and reduce regional disparities. The progress made in attaining the political goals and supporting approaches based on policy implementation are measured by spatial indicators (European Union, 2011; European Commission, 2014). The main target of the reformed European Union Cohesion Policy is to deliver a coherent investment policy in order to achieve the Europe 2020 Strategy goals and reduce regional disparities (González *et al.*, 2015).

The cohesion policy regulation for 2014–2020 contains a range of new measures to strengthen the strategic orientation of programming and incentivize better performance. Programmes have to specify objectives, intervention logics and results targets more clearly (Bachtler J., Mendez C., Kah S., 2013).

At present, new methods to evaluate cohesion by assessing interdependence relationships among the economic variables network, focussing only on living standard indicators exist (e.g. GDP, labour employment, and productivity). In keeping with this new approach, cohesion is viewed as a qualitative-quantitative effect of political decision-making (Lo Monaco, 1983; Prezioso, 2008).

According to Davoudi, 2005, the Community Strategic Guidelines stresses that, 'the territorial dimension of Cohesion Policy' should be taken into account and its concept such as, 'extend[ing] beyond the notion of economic and social cohesion, its objective being to help achieve a more balanced development, to build sustainable communities in urban and rural areas and to seek greater consistency with other sectoral policies which have a spatial impact'.

The current challenge of incorporating geography in impact-modelling raised by the new cohesion policy is different, and macroeconomic models, presently available for policy evaluation, have only limited relevance in this respect. The new type of models should incorporate those various dimensions of geography that affect the overall impact of modern development policies (Varga, 2013).

The main objective of this paper is to identify disparities in terms of the territorial cohesion of Romania's Danube Valley at a micro-scale level (local administrative units – LAU). The way in which the cohesion policy has been defined as a political tool focused on the regions' development level, could not be used in treating the majority of these issues, which requires a territorial analysis on various scales. This approach was carried out by grouping the elementary indicators in three secondary indexes (life quality, environmental quality, and social quality) in order to stress out the main territorial cohesion differences. Thus, analysing territorial cohesion in the Danube Valley, several aspects, such as, demography, economy, education, health-care, technical-building infrastructure, cultural, life quality, social exclusion and the environment had to be taken into account.

2. DATA AND METHODOLOGY

Since the territorial cohesion is a complex phenomenon, no single method is able to quantify it. It is important to determine the optimal territorial assessment scale. In the case of Romania, the possible territorial levels may include the national one, macro-regions and/or development regions (NUTS1 and/or NUTS2) and NUTS3/LAU (county level). Also, certain functional areas could represent a territorial scale for the assessment of territorial cohesion. For the evaluation of territorial impacts at a highly disaggregated level, complex methods are available which integrate qualitative and quantitative tools. An essential element of these evaluations is the use of subjective expert assessment (Zsibók Zsuzsanna Márkusne, 2013).

This study relies on the statistical data available at the lowest level of administrative territorial units (LAU or NUTS5) provided by the TEMPO-Online time series published by the National Institute of Statistics. For the current study the authors used the 2015 data for computing the selected indicators.

The selection has been made following the analysis of several papers, scientific reports, and official documents elaborated by experts (e.g. primary indicators monitored by the Territorial Observatory, Prezioso 2006, 2008; Methodology of obtaining the Territorial Development Index, Romania's Territorial Development Strategy, *INTERCO Indicators of territorial cohesion*, ESPON 2011). Noteworthy, an important selection criterion was the availability of local administrative units (LAU) statistical data.

The authors selected 14 statistical indicators in order to emphasize high cohesion and lower cohesion areas: demographic dependency rate = DEPENDDEMO; migration growth = MIGR; employment rate = EMPLOY; no. of hospital beds/1,000 inhabitants) = HOSPITBED; visitors in museums = VISITMUSEUM; number of tourist accommodation places = TOURACC; road accessibility = ACCES; goods transported on inland waterways (thousands tones/km) = WATERTRANSP; length of sewerage system = SEWER; waste-water treated flow (cubic meters/day) = WATERPURIF; artificial area (% of land covered with transport routes and land covered with buildings/total land fund) = ARTIFAREA; graduates of primary and secondary education = GRADUATES; composite index of the social disadvantage (DISADVINDEX); fertility rate = FERTILITY. Given that the statistical indicators were calculated by different measurement units, an important step was to apply a normalization procedure using the national average of each selected indicator (Fig. 1).
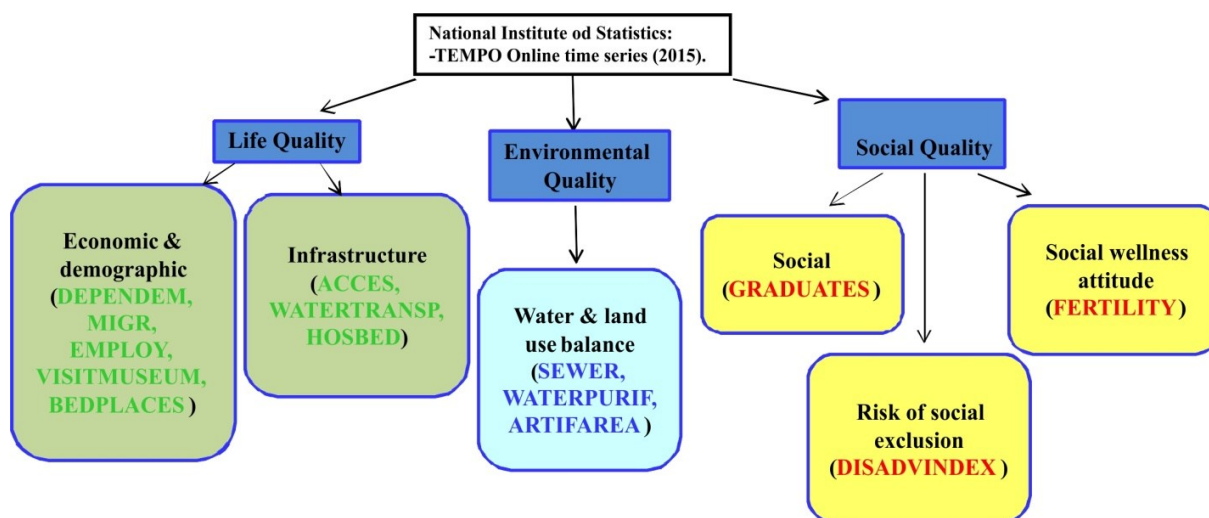
Fig. 1 – TCI Index design (Source: authors' compilation).

The Territorial Cohesion Index, computed as Hull Score of the 14 indicators, shows the following:

TCI = 50+ 14*(MIGR + EMPLOY + HOSPITBED + TOURACC + VISITMUSEUM + ACCES + WATERTRANSP + SEWER + WATERTREAT + GRADUATES + FERTILITY – DEPENDDEM – ARTIFAREA – DISADVINDEX)/14.

3. STUDY-AREA

In Romania, there are four development regions and twelve counties (Caraş-Severin, Mehedinţi, Dolj, Olt, Teleorman, Giurgiu, Călăraşi, Ialomiţa, Constanţa, Tulcea, Brăila and Galaţi) situated alongside the Danube River. The life of resident communities is shaped by 1,075 km of the Danube, out of which over 759 km correspond to the border line with Serbia and Bulgaria, being located in the southern part/periphery of Romania. As the territorial cohesion policy is part of the spatial development policies and it therefore means eliminating, or reducing, regional economic, social and other disparities (Leimgruber, 2004 quoted by Luukkonen, 2010), it is better to speak about peripherality, because of its deeper connotations with the core. That is, having disparities means having at least two different developing regions (e.g. the core and the periphery). Marginality can also be voluntarily caused, and it has positive connotations since marginal (different) subjects can be agents of innovation, whereas peripherality is seen more as an enforced situation (Leimgruber, 2004, quoted by Luukkonen, 2010).

At present, the 266 local administrative units (LAU) in the Romanian Danube Valley number 238 communes, 28 municipia and towns and a population of 1.7 million inhabitants (2014), out of which 42.0% is rural and 58.0% is urban (Fig. 1).

Most Danube Valley towns (19) fall into the small-size category (under 20,000 inh.), Şegarcea (Dolj County) standing at the bottom with only 3,657 inhabitants. The middle-size category (20,000–100,000 inh.) includes 7 towns together with two large-size categories (over 100,000 inh.), of which Galaţi City is the largest (249,423 inh.). The LAU2 population goes from 542 in Padina Commune (Tulcea County which encompasses the Danube Delta, a less-favoured territory for the development of settlements) and 10,470 in Poiana Mare Commune (Dolj County).

The negative population dynamics (20%) over 1992–2011 reveals the deep-seated crisis in this area, in both the rural and the urban settlements, especially in case of small and middle towns,

numerous demographic aspects correlating with the economic and social situations (Dumitrescu, 2008, Vârdol, 2009, Mitrică *et al*., 2016).

The Romanian Danube Valley population registers a decrease, especially in small towns and rural areas, due to migration to larger cities, mainly to Bucharest, the country's capital-seat, or abroad (Nancu *et al*., 2016) (Table 1, Fig. 2).

Table 1

The structure of the settlement system in the Romanian Danube Valley.

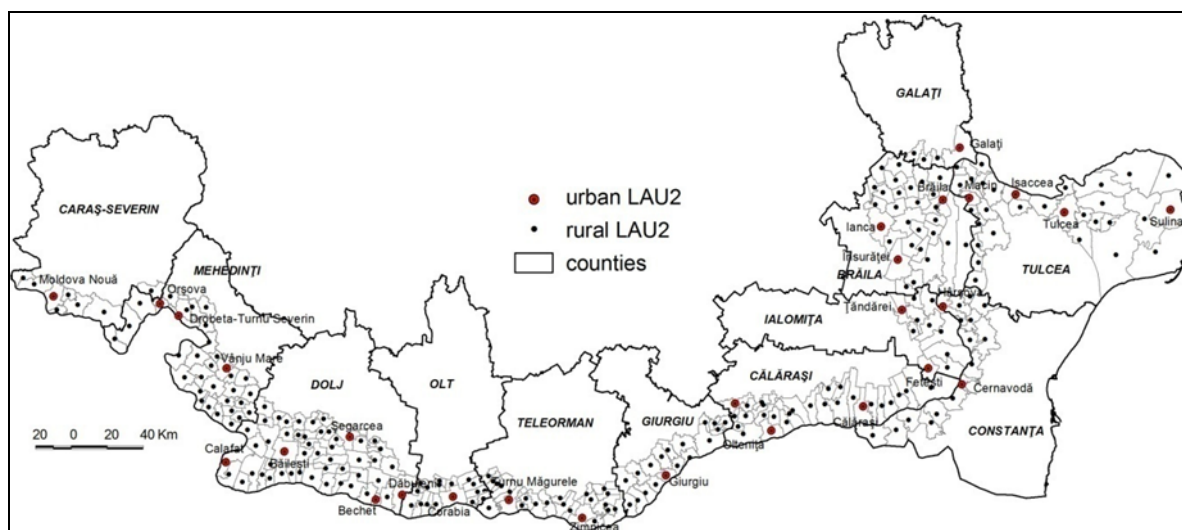| *Development regions*	*County*	*Urban LAU2*	*Rural LAU2*	*Total LAU2*
West	Caraș-Severin	1	7	8
South-West Oltenia	Mehedinți, Dolj, Olt	9	91	100
South Muntenia	Teleorman, Giurgiu, Călărași, Ialomița	8	70	78
South-East	Constanța, Tulcea, Brăila, Galați	10	70	80

Fig. 2 – The structure of the settlements system in the Romanian Danube Valley.

4. RESULTS AND DISCUSSION

4.1. The life quality

According to the Lisbon Strategy's objectives, the overall achievement of a good life quality level has to be supported by policies aimed at guaranteeing adequate economic conditions to meet the families' needs. These are measured by the per capita GDP, level of consumer prices and employment and by an adequate level of all the non-economic aspects that contribute to the health condition, basic public health, which is commonly considered an indirect indicator of productivity and economic dynamism (Prezioso, 2008).

The demographic-dependency rate is influenced by birth, mortality and migration rates, which shapes the economic dependency rate (Institutul Național de Statistică, 2015). By relating the population group, most likely to be economically dependent (net consumers) to the group most likely to be economically active (net producers), changes in the dependency ratio pinpoints the potential social/life quality support requirements resulting from changes in the population age-structures (United Nations, 2018).

Demographic-dependency rate values are higher than the national average (54.8% in 2015) in 188 Danubian LAU (77.7% of the total network) because of ageing phenomena and a negative migratory balance. The values range from a maximum of 31.1% in Drobeta-Turnu Severin town (Mehedinţi County) to 100.5% in Uda-Clocociov Commune (Teleorman County). The lowest values, under 40%, are registered in the urban area, especially in those towns with a higher demographic potential, while the highest values, over 85%, characterized the rural areas, especially some rural LAU from Dolj, Mehedinţi and Brăila counties. The lower or higher demographic dependency values are relevant when analysing the birth-rate, death-rate, life expectancy, a settlement's development level, etc.

Migratory balance. Migration tends to promote convergence between regions; the poles of attraction are usually the more affluent regions, also more advanced in terms of demographic transition. The main role should be played by towns in providing access to services including the infrastructure necessary to invest in the adaptability of people and enterprises, a key-factor in avoiding rural depopulation and ensuring these areas remain attractive places to live in (European Commission, 2008). One of the factors involved in population shrinkage is the negative migratory balance, values varying from -2.2 ‰ in Ion Corvin Commune (Constanţa County) to 3.1‰ in Şendreni Commune (Galaţi–Brăila Metropolitan Area), 123 of the LAU having negative values.

Health-care. The health-care index (Dumitrache, 2004) reveals the geographical distribution of health-care resources in Romania, the most disadvantaged counties being those lying along the Danube Valley. Ialomiţa County is the poorest in terms of health-care resources. However, limited resources also have Giurgiu, Teleorman, Olt, Mehedinţi, Brăila and Tulcea counties. Null values of hospital beds/1,000 inhabitants are registered in 243 Danubian LAU (91.3% of the total LAU network) and below one physician/1,000 inhabitants in 226 Danubian LAU (85.0% of the total LAU network). The highest values scored the main Danubian cities (Galaţi, Brăila and Drobeta Turnu-Severin), or some rural settlements with departments of urban hospitals or even small hospitals.

Employment. Evaluating the economic impact is an essential component of the overall assessment of the EU cohesion policy (Batterbury, 2006 quoted by Varga, 2013). It estimates the aggregate influence of policy interventions on such variables as GDP, employment or wages. The European employment policy highlights another cohesion paradox: cities are places with higher employment and unemployment rates (3/4 of the EU cities have the lowest ratio of employed residents measured throughout the State), thus making the achievement of the Lisbon Agenda goals (employment rate at 70%) (Prezioso, 2008), a difficult task.
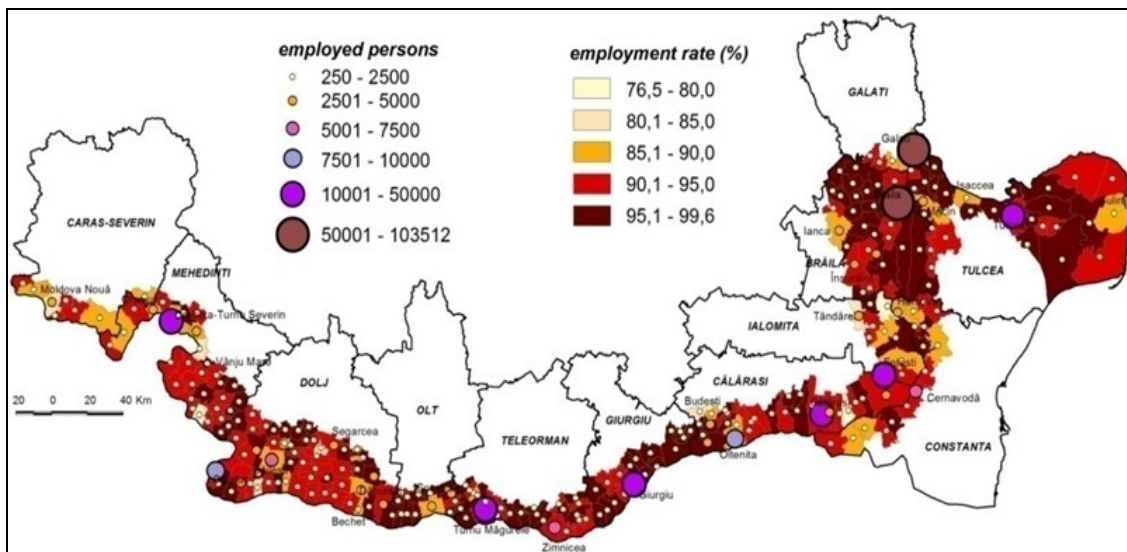

Fig. 3 – The employment rate.

The 2011 Census showed that settlements with a low-value employment rate gained ground in the Danube Valley, a very worrying situation because low values fell even more (the minimum value was 70% in 1992 and only 22% two decades later). Extreme values vary from 76.5% in Gârla Mare rural LAU2 to 99.6% in Tia Mare rural LAU2, the highest ones, over 98%, are recorded in 17 rural LAU2, most of them in Olt County (Fig. 3).

The lowest values, under 85%, are specific to Gârla Mare (Mehedinți County), Dichiseni (Călărași County), Giurgeni (Ialomița County), Cerat (Dolj County) communes and to Budești, Țăndărei and Moldova Nouă towns.

Tourist accommodation. Sustainable development of tourism is fully in line with the cohesion objectives of a balanced development of the EU territory. Tourism has the potential to allow for a more even distribution of economic activities and of employment opportunities over the EU territory. The sustainable development goals applied to the activity of tourism will ensure its good management under fair economic and social conditions while contributing to environmental protection, including the preservation of the natural EU heritages (European Union, 2006).

Tourist accommodation places are to be found in only in 56 Danubian LAU (21.4% of the total LAU network) and the most numerous ones (5,950 out of a total of 12,083 tourist accommodation places) are concentrated in 4 large towns (Galați, Brăila, Drobeta-Turnu Severin and Tulcea) and in some rural LAU, located in the Danube Delta (2,688 places). There are 38 LAU with less than 100 tourist accommodation places.

Number of visitors in museums. The total number of visitors in museums is unequal in the 19 Danubian LAU (14 urban and 6 rural) recording this indicator: 621,962 visitors, out of which 581,544 people visited urban museums in Galați, Tulcea, Călărași, Brăila and Drobeta-Turnu Severin towns.
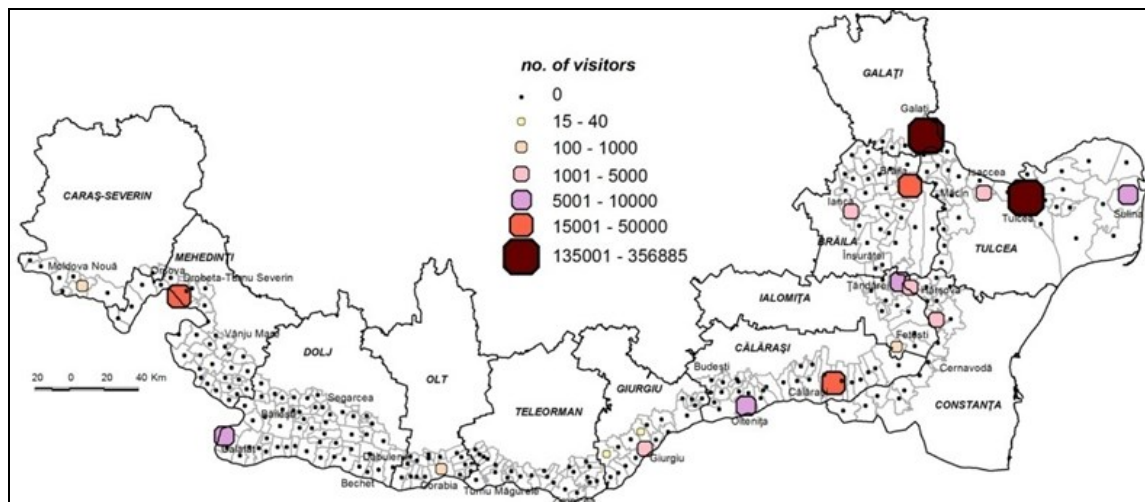

Fig. 4 – The total number of visitors in museums.

The number of visitors in museums vary from 15 people in Gogoșari rural LAU2 (Giurgiu County) to 356,885 people in Galați Towns (Galați County), while 247 LAU2 (92.9% of the total network) have no visitors in museums (Fig. 4).

Road accessibility. The development of transport is closely connected with the economic development, transport being one of the basic components of the socio-economic progress, the end point of commodity production and dissemination for production, or consumption (Intermodal Transport Strategy in Romania–2020, 2011 quoted by Damian and Șerban, 2017). The development of the TEN for transport, telecommunications and energy is part of the EU-general strategy for cohesion, aimed at harmonious planning and development. The objective of the trans-European networks is to

connect national infrastructures in a coherent manner and to ensure continuity of services between island, landlocked and peripheral regions and central regions, with aid in particular from the Cohesion Fund (European Union, 2006).

Very good and good accessibility have 15 LAU2 located along the highway and the European roads, mainly in the South-Eastern part of the Danube Valley (Fig. 5).
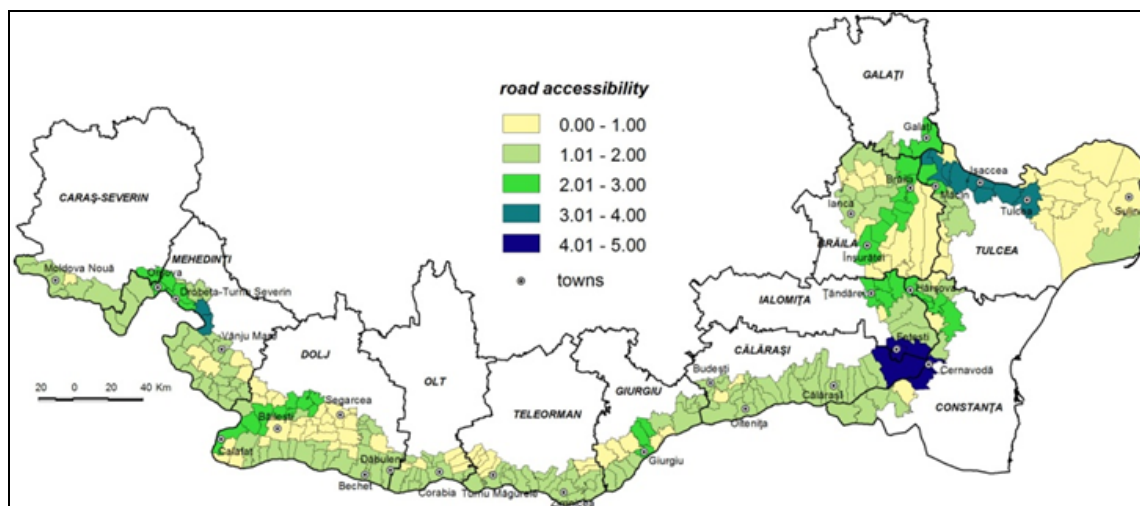

Fig. 5 – Road accessibility (Source: www.sdtr.ro).

Medium accessibility have 37 LAU2 crossed by national roads, with lowest values for the LAU2 situated along county roads (77 LAU2).

Transported goods. The Danube River in Romania is the backbone of the Lower Danube and of the entire Danube Region, its economy connecting Rotterdam harbour (North Sea) to Constanţa harbour (Black Sea). The first Priority Area of the European Union Strategy for the Danube Region is to improve mobility and intermodality of inland waterways. Among the objectives of this priority area are: 20% increased cargo transport on the River in by 2020 compared to 2010; solving the obstacles to navigation and establishing an effective waterway infrastructure management by 2020; developing efficient multimodal terminals at the River ports along the Danube (http://www.danube-region.eu/about/our-targets). The 20 Danube harbours facilitate the transport of goods, mainly through Galaţi, Drobeta-Turnu Severin and Tulcea, which cumulate 75.5% (3,860,385 thousand tonnes/km) of all the goods carried on the Danube.

4.2. Environmental quality

As argued in the 5th Cohesion Report, territorial cohesion highlights various issues which are central to the cohesion policy. Among these are the environmental dimension of sustainable development and the use of flexible functional geographies for territorial development. Environmental challenges are increasing in number and importance. A large share of cohesion policy resources has always been invested in measures to improve the quality of the environment, or to tackle key-environmental challenges (European Commission, 2017).

Sewerage network. Public water supply and sewerage services are among the utilities of general public interest. The EU Green Paper has introduced the concept of a partnership between the different levels of governance in Europe, considering that public services of general economic interest are paramount in maintaining cohesion, improving the quality of life and securing sustainable development

(European Commission, 2014). The sewerage system has an important role in guaranteeing public health, environmental protection and enhancing the living standard.

There are counties where no rural settlement has a sewerage system (199 rural LAU, 74.8% of the total studied network), and in the few communes where it does exist, the network length is very short (e.g. Brăila, Călăraşi, Giurgiu, Olt and Teleorman) (35 LAU have between one and 10 km) (Fig. 6).
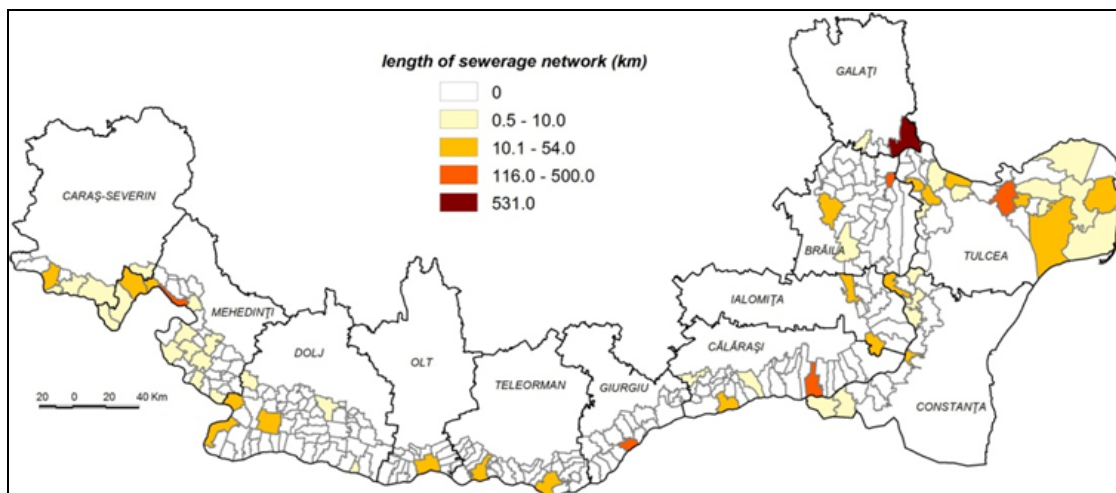

Fig. 6 – Sewerage network length.

The length of the sewerage system ranges from 0.5 km in Ghindăreşti Commune (Constanţa County) to 531 km in Galaţi City. A length of over 100 km have only county-seat towns with more than 50,000 inhabitants (Galaţi, Brăila, Giurgiu, Drobeta-Turnu Severin, Tulcea, and Călăraşi).

Waste-water treatment. Despite general progress in reducing environmental pressures (notably as regards wastewater and waste treatment), more efforts are needed to meet EU environmental goals. According to Waste-Water Treatment Directive 9th Reporting Exercise, the required level of waste-water treatment before 2018 shows compliance rates below 40% in some Romanian regions and 3% throughout Romania (European Union, 2011). Only 19 Danubian LAU have waste-water treatment stations (5 are in rural LAU and 14 in urban LAU). These stations recorded a total daily flow of treated waste-water somewhere around 170,851 cubic meters.

Artificial areas. The values of artificial areas (% of land covered with transport routes and land covered with buildings of total land fund) depend on the local geographical conditions, the demographic size of settlements, the regional and local development of the economic units and the transport networks, etc. In the Romanian Danube Valley, the smallest artificial area is in Crişan Commune, Tulcea County (0.1%), the largest one being in Brăila City (69.3%). The lower percentages covered with artificial areas are in zones where this type of land-cover has a restrictive potential, mainly in the Danube Delta and the Danube Defile. In seven rural LAU2 in the Danube Delta, the artificial land-cover area is under 1%. The majority of LAU (243, i.e. 91.4% of the total LAU network) registered artificial land-cover values between 1.0 and 10.0% (Fig. 7). Values above the national average are characteristic of 128 LAU, i.e. 48.1% of the total network.

Values between 10.0% and 39.5% are characteristic for 13 LAU, 11 of which are urban (Fig. 7). Cities tend to be more efficient in their use of land. In cities, built-up or artificial areas/person are only a quarter of those in rural areas. This reflects the fact that the availability of land and its cost make cities more attractive for less land-intensive activities, such as services, company headquarters or leisure facilities, than suburbs or rural areas are. Between 2006 and 2012, the built-up/artificial area/inhabitant increased most in cities of the Southern and Central-Eastern EU, while it declined in a number of large cities in Northern and Western Europe (European Commission, 2017).
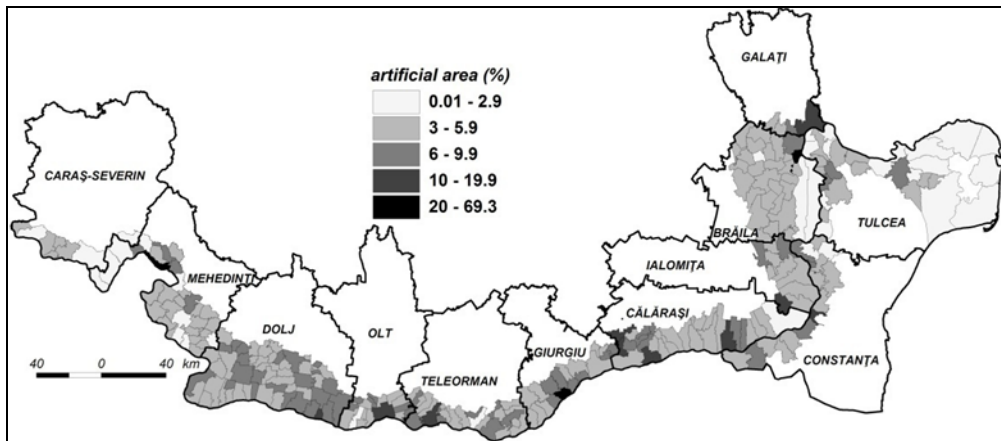
Fig. 7 – Artificial areas.

4.3. Social quality

The social quality approach measures the quality of the social context of everyday life, and differs from the quality of life approach in that it is grounded in a theory of 'the social' – it is a sociologically grounded approach, as opposed to the quality of life approach, which takes the perspective of the isolated individual as the ultimate reality (Wallace and Abbott, 2009).

Education. To improve performance, multiple changes need to happen at the same time: a stronger export-orientation, a shift new sectors and activities, a boost to research and innovation, an increase in education and training and an improvement in the business environment. One of the Europe 2020 targets is to reduce the share of early school leavers to 10% or less. At the EU level, the share of those aged 18–24 with no qualifications beyond basic schooling and no longer in education or training in the 2014–2016 period was 11%, close to the target, but with wide differences between and within countries. In Spain, Portugal, Italy, Bulgaria and Romania, for example, the share in almost all regions was far above the target, whereas in Belgium, Germany, the UK and Greece, there was wide variation between regions, with some close to the target, or below it and others far above it (European Commission, 2017).

The number of primary and secondary school graduates is about 14,760 persons (8,525 in towns, 60% of which are concentrated in the four important Danubian cities: Galaţi, Brăila, Drobeta Turnu-Severin and Tulcea). A higher number of graduates is registered in county-seats towns: Galaţi (2,094), Brăila (1,421), Drobeta-Turnu Severin (926), Tulcea (651), Călăraşi (567) and Giurgiu (486). Each rural LAU2 has between 96 and 2 graduates (Poiana Mare, Dolj County and Carcaliu, Tulcea County, respectively), the majority (139 LAU) having between 2 and 25 graduates.

Social disadvantage. The concept itself and, therefore, the expectation of a relationship between social cohesion and social development, is relatively recent (Jenson, 2010). The Copenhagen commitments (1995) demonstrate that social development is not simply a matter of social service provision. It also depends on a range of political, economic, institutional, and cultural factors which, together, play a critical role in poverty reduction and social inclusion (World Bank, Social Development Department, 2000).

For assessing the levels of social development, the Social Disadvantage Index (SDI) was used. The indicators took into account for computation this index are: the unemployment rate, the Roma population, the employment in agriculture, dwelling unconnected to the public water supply network, dwellings without central heating system, and living floor/inhabitant. The SDI has very different values (maximum 0.688 in Gârla Mare – Mehedinţi County and minimum 0.072 in Galaţi City) (Fig. 8). The large cities (Galaţi, Brăila, Drobeta-Turnu Severin and Tulcea) have the lowest index values due mainly to a higher living standard.
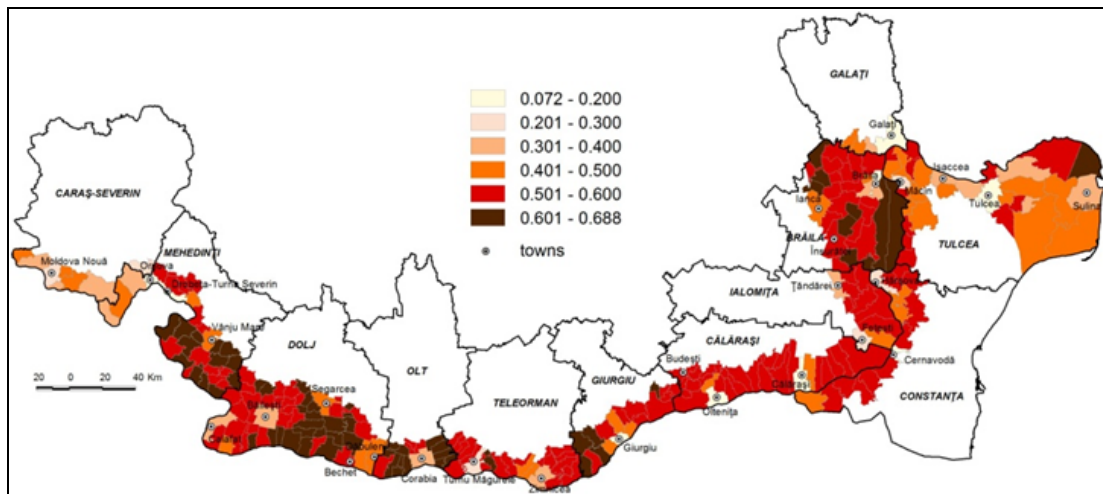
Fig. 8 – Social Disadvantage Index.

The deeply disadvantaged areas in terms of social development are concentrated in rural settlements and small towns (Budeşti, Vânju Mare, Bechet, etc.) which have a high and very high index score (Fig. 8).

General fertility rate. The European Union features both low fertility, motherhood postponement and an increase in childlessness among the younger generations. In the EU-27 countries, cross-region differences are notable. Low fertility seems to be due to a combination of inter-connected factors, with the prevalence of a male 'breadwinner' model and inflexible childcare provision, making it difficult for women to combine work and family duties. Childlessness is also becoming more socially acceptable, which could be a contributing factor to the relatively low fertility rate (Hoorens, 2011).

Romania shows the largest regional variations of EU-27 (European Parliament, 2013), in 2015 the fertility rate value (expressed in number of live-births/1,000 women of fertile age (15 to 49 years-old) was 35.9‰. In the Romanian Danube Valley, 160 LAU recorded fertility rate values above the national average, with a maximum of 120.1‰ in Catane Commune, Dolj County, and a minimum of 10.3‰ in Liţa Commune, Teleorman County (Fig. 9). Maximum values were recorded by the rural and urban settlements where the Roma population (traditionally recording high birth and fertility rates) is numerous (Cătane, Ţăndărei, Gruia, etc.).
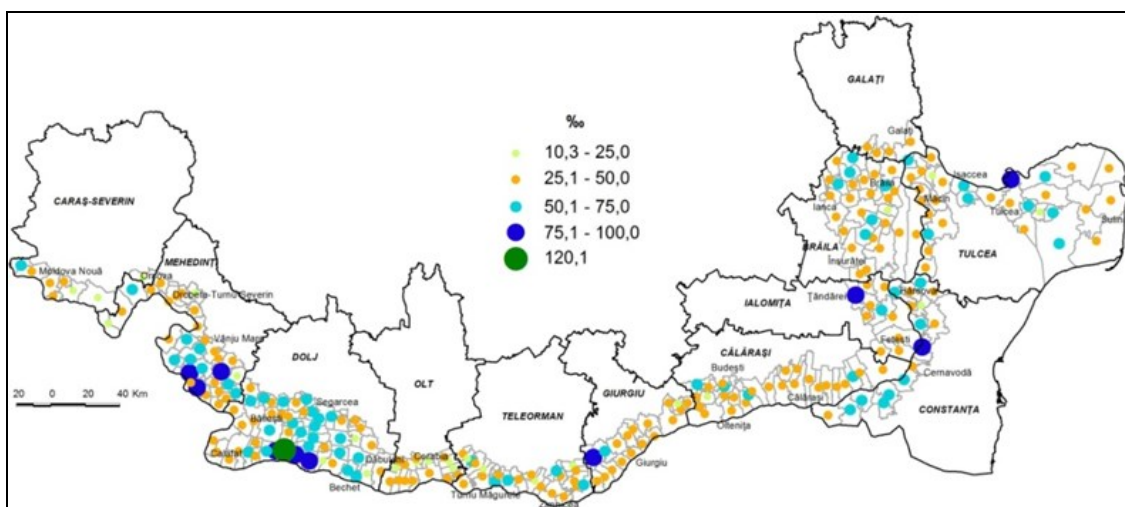

Fig. 9 – General fertility rate.

In 2011, the European Parliament passed a Resolution on the implications of demographic change for a Cohesion Policy at regional level. The growing importance of demographic issues is reflected in their ever greater prominence in the Cohesion Policy 2007–2013 and 2014–2020 programming periods (European Parliament, 2013). In 2005 the European Commission made a clear commitment to 'demographic renewal' in Member States with low fertility rates, and national governments began to implement policies, implicit or explicit, to address these challenges (Hoorens, 2011).

4.4. Territorial Cohesion Index

Following the clustering of the life quality environmental and social quality indicators, resulted the Territorial Cohesion Index (TCI). The TCI values vary between 48.2 in Crivăţ Commune (Călăraşi County) and 98.3 in Galaţi City, the 266 LAU2 being grouped by six classes (Fig. 10).
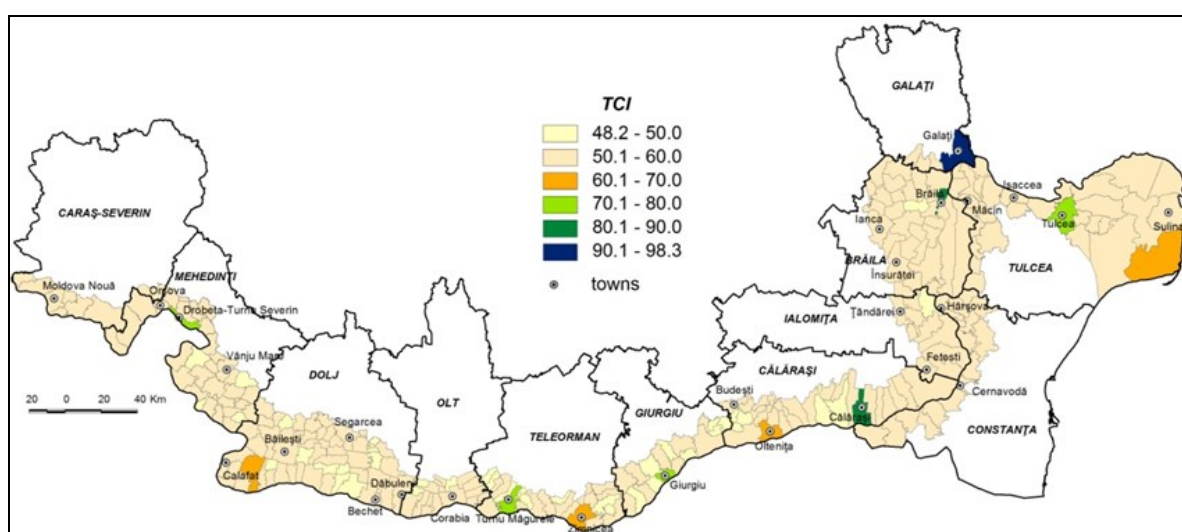

Fig. 10 – Territorial Cohesion Index disparities.

At the top of the hierarchy stands Galaţi City (98.3) (Fig. 10), an urban development pole, through the high number of hospital beds/inh., accommodation places, museum visitors, quantity of transported goods, sewerage network length and low demographic-dependency, as well as less-favoured social index values. What is particularly important is to ensure access to road, train, air and water transport, as well as to other infrastructures, e.g. wide-band and European energy networks. Galaţi City has moderate road accessibility, but very high water-based access which accounts for the intense harbour traffic of goods.

The second place is held by the towns of Brăila and Călăraşi (Fig. 10), pole of urban development and pole of county development, respectively. The high territorial cohesion 83.2 in the city of Brăila is due to the big quantities of carried goods, sewerage network length, number of museum visitors, primary and gymnasium graduates and low values of demographic-dependency rate and of the social disadvantaged index. In Călăraşi, territorial cohesion stands high (82.6) owing to the elevated values of waste-water treatment flow, big quantities of carried goods, low demographic-dependency values, and a small artificial area per total administrative area.

Next in line comes the *71–80 value class*, which includes four towns, three of them county-seats – Giurgiu, Drobeta-Turnu Severin, Tulcea and Turnu Măgurele (Fig. 10). These towns feature low demographic-dependency, a high number of hospital beds/inh. (topping the Romania average),

medium-high fertility rate, and small social disadvantaged index values. In terms of accessibility, Turnu Măgurele registers low values, Giurgiu and Drobeta-Turnu Severin fall into the middle values, while Tulcea is the most accessible of all (it is crossed by the Râmnicu Sărat – Brăila – Tulcea – Constanţa National Roadway DN22). Indicator values with a negative impact on the degree of territorial cohesion are fertility rate and the flow-rate of waste-water treatment stations in operation.

Value class 60 and 70 (average territorial cohesion) includes the towns of Olteniţa and Zimnicea, as well as Poiana Mare (Dolj County) and Sfântu Gheorghe (Tulcea County) communes (Fig. 10). The indicators involved in the high social cohesion are: high population employment rate in Sfântu Gheorghe and Poiana Mare communes, the quantity of goods shipped through Olteniţa and Zimnicea harbours, and the social disadvantage index, somehow lower in the two towns and more elevated in Sfântu Gheorghe and Poiana Mare communes. Low values with negative impact on the territorial cohesion degree are related to the the number of hospital beds (0) in Sfântu Gheorghe Commune, accommodation places in Poiana Mare Commune, museum visitors in Zimnicea Town and Sfântu Gheorghe Commune.

The low cohesion value class (50 and 60) numbers 217 LAU2 among which 19 towns and 198 communes spread out evenly alongside the Danube Valley (Fig. 10). Although Feteşti and Cernavodă towns are easily reached by road (A2 Highway), yet all the other indicator values account for their low cohesion degree. Settlements located alongside transport corridors should become effective development corridors, easily accessible and attractive for investors, locals and tourists. In the same class also fall the towns of Calafat, Şegarcea, Moldova Nouă and Orşova. Despite scoring high in terms of accommodation places, these towns have low values for territorial cohesion. There are some Danube Delta settlements (e.g. Murighiol, Sulina, Maliuc and Crişan) in which various statistical indicators contribute to the end-value of the territorial cohesion degree, due to numerous accommodation places; many museum visitors (Sulina and Calafat); significant quantities of treated waste-waters (Corabia, Însurăţei and Calafat). Some rural settlements (Tia Mare, Gârcov, Vădastra, Ianca, and Cilieni) boast high fertility rates (over 75%). There are communes Catane, Negoi, Cârna, and Bistreţ (Dolj County), Punghina, Gruia, and Gârla Mare (Mehedinţi County), Seimeni (Constanţa County), Gogoşari (Giurgiu County) and Ceatalchioi (Tulcea County) with elevated labour employment values (especially in agriculture).

The very low cohesion class numbers 38 communes in the counties of Dolj – 9, Giurgiu – 8, Teleorman – 7, Călăraşi – 5, Mehedinţi – 4, Olt – 3 and one in Brăila and in Ialomiţa (Fig. 10). These communes have all indicator and index values depleted, but for migration and occupancy rate (especially in agriculture). There is reduced road access (except for Giurgeni Commune with a medium accessibility record), least easily reached being those settlements accessible solely through county and local roads, which, generally, also score lowest accessibility values, suggesting a direct correlation among an area's road access, the degree of its settlement isolation and territorial cohesion.

5. CONCLUSIONS

In terms of the statistical indicators used to measure territorial cohesion, the Romanian Danube Valley sector appears to lack unity. Its low territorial cohesion is the result of the action in time of the economic, political, demographic, socio-cultural and historical forces which, together or individually, have impacted this geographical area. In view of it, the Danubian economy and population are concentrated in the Galaţi–Brăila metropolitan area (the two big cities having 22.4% of the entire study-area population and 56.1% of all the water-carried goods). However, the station is similar also in the other county-residence cities (Drobeta-Turnu Severin, Tulcea, Călăraşi and Giurgiu) which hold 18.1% of the Danube Valley population and 22.4% of all the water-carried goods. Increasingly less attractive for

the economic activities and the population are the disadvantaged physical geographical and socio-economic areas located at the far-off periphery. This is the case of settlements in less developed counties, e.g. Olt, Teleorman and Giurgiu, as well as the settlements in the Ialomiţa and Brăila Lake-area.

Generally, at national and regional levels disparities between urban centres and the deeply rural areas are being maintained, or even increased in most of cases. Also, locally, the big urban agglomerations show significant problems related to social segregation and exclusion (European Union, 2011). The contrasting spatial dynamics described above is even more apparent in those countries where economic growth is concentrated in a strong capital region, while peripheral regions are constantly losing economic power (Zsibók Zsuzsanna Márkusne, 2013). This is the case of Romania, where Bucharest, the capital-city, has a strong attracting human and economic potential. The fundamental question is not whether the state should intervene to correct the injustices that are generated by the operations of the market economy, but rather how much intervention, when, at what level and in what form should be made (Hall, 2005 quoted by Davoudi, 2005).

Balanced and sustainable economic development, inclusive of territorial cohesion, would lead to a more unitary and sustainable use of the Danube area development availabilities, offering advantages since little concentration of and pressure on coasts could prove beneficial to both the environment and the quality of life (European Commission, 2008).

In line with the Treaty on the Functioning of the European Union (Art. 174 and 175), all policies and actions of the EU should contribute to economic, social and territorial cohesion. Therefore those responsible for the design and implementation of sectoral policies should take the principles and objectives of the Territorial Agenda into consideration. The coherence of EU and national policies is of utmost importance for territorial cohesion. Most policies have significant territorial impacts, influencing the development opportunities of territories in different ways. The coordination of different sectoral policies to optimise territorial impact and maximise coherence can significantly increase their success, and help avoid, at all territorial levels, negative effects from conflicting policies. The optimal balance of sustainability, competitiveness, and social cohesion can be realised through integrated territorial development (European Union, 2011).

The White Paper on the Future of Europe launched a debate on which direction the EU should take in the coming years. Together with its reflection papers, it covers three main linked questions relating to cohesion policy: 1. Where should it invest? 2. What should the investment priorities be? and 3. How should the policy be implemented? (European Commission, 2017a). Implementation instruments and competences are in the hands of EU institutions, Member States, regional and local authorities (Cotella, 2012).

REFERENCES

Bachtler, J., Mendez C., Kah S. (2013), *Reflections on the performance of cohesion policy*, in: Kovács Ilona Pálné, Scott J., Gál Z. (Eds.), *Territorial cohesion in Europe*, Institute for Regional Studies, pp. 46–58.
Batterbury, S., (2006), *Principles and purposes of European Union cohesion policy in less-developed countries and regions*, Regional Studies, vol. **40**, no. *2*, pp. 189–199.
Comisia Comunităţilor Europene (2008), *Carta verde privind coeziunea teritorială. Transformarea diversităţii teritoriale într-un avantaj*, http://ec.europa.eu/regional_policy/archive/consultation/terco/paper_terco_ro.pdf, 13 p.
Comisia Europeană (2008), *Cartea Verde privind Coeziunea Teritorială, calea de urmat Inforegio*, nr. **28**, 20 p.
Commission of the European Communities (1999), *European spatial development perspective: Towards balanced and sustainable development of the territory of the EU* (Luxembourg, Office for Official Publications of the European Communities).

Commission of the European Communities (2001), *Unity, solidarity, diversity for Europe, its people and its territory: Second report on economic and social cohesion*, Luxembourg, Office for Official Publications of the European Communities.

Commission of the European Communities (2004), *A new Partnership for cohesion: Convergence, competitiveness, cooperation – Third report on economic and social cohesion*, Luxembourg, Office for Official Publications of the European Communities.

Cotella, G. (2012), *Editorial – Cohesion and Development in the EU: a multi-level issue*, Europa XXI, vol. 22, pp. 5–10.

Damian, Nicoleta, Şerban, P. (2017), *The Role of the International Transport in the Development of Commercial Activities in the Romanian Danube Valley*, in vol. Lower Danube Basin. Approaches to Macroregional Sustainability, Dan Bălteanu (Ed.), pp. 214–227.

Davoudi, S. (2005), *Understanding Territorial Cohesion*, Planning, Practice & Research, Vol. **20**, No. *4*, pp. 433–441, November 2005, DOI: 10.1080/02697450600767926.

European Commission (2008), *Green Paper on Territorial Cohesion turning territorial diversity into strength*, Bruselles, http://ec.europa.eu/regional_policy/archive/consultation/terco/paper_terco_en.pdf (accessed January 2017).

European Commission (2014), EU Green Paper, http://ec.europa.eu/green-papers/

European Commission (2014), *Investment for jobs and growth. Promoting development and good governance in EU regions and cities. Sixth report on economic, social and territorial cohesion*, Bruselles, http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/cohesion6/6cr_en.pdf (accessed September 2016).

European Commission (2017), *My Region, My Europe, Our Future. Seventh report on economic, social and territorial cohesion*, http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/cohesion7/7cr.pdf (accessed May 2018).

European Commission (2017b), White paper on the future of Europe. Reflections and scenarios for the EU-27 by 2025, Bruxelles, https://ec.europa.eu/commission/sites/beta-political/files/white_paper_on_the_future_of_europe_en.pdf (accessed May 2018).

European Parliament, Directorate-General for Internal Policies, Policy Department B: Structural and Cohesion Policies (2013), *How can regional and cohesion policies tackle demographic challenges?*, http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/513981/IPOL-REGI_ET(2013)513981_EN.pdf.

European Union (2006), *Sustainable tourism as a factor of cohesion among European regions*, https://cor.europa.eu/en/documentation/studies/Documents/Sustainable-Tourism.pdf

European Union (2011), *Territorial Agenda of the European Union 2020 – Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions.* The Informal Ministerial Meeting of Ministers responsible for Spatial Planning and Territorial Development. Gödöllő. Hungary. https://www.mmr.cz/getmedia/fb9825b3-9d22-490d-bcd0-43528e505ea3/Uzemni-agenda-2020-(EN-verze) (accessed January 2017).

Faludi, A. (2004), *Territorial cohesion: old (French) wine in new bottles?*, Urban Studies, **41** (*7*), pp. 349–1363.

Faludi, A. (2006), *From European spatial development to territorial cohesion policy*, Regional Studies, **40**, pp. 667–678.

Faludi, A. (2013), *Territorial cohesion, territorialism, territoriality, and soft planning: a critical review*, Environment and Planning, vol. **45**, pp. 1302–1317, doi: 10.1068/a45299, http://journals.sagepub.com/doi/pdf/10.1068/a45299.

González, A., Daly, G., Pinch, P., Adams, N., Valtenbergs, V., Burns, M.C., Johannesson, H. (2015). *Indicators for Spatial Planning and Territorial Cohesion: Stakeholder-Driven Selection Approach for Improving Usability at Regional and Local Levels*, Regional Studies **49**/*9*, pp. 1588–1602. http://dx.doi.org/10.1080/00343404.2015.1018883.

Hall, P. (2005) *Fundamental question for the ESDP*, Town and Country Planning, November, pp. 330–331.

Hoorens S., Clift J., Staetsky Laura, Diepeveen Barbara Janta Stephanie, Morgan Jones Molly, Grant J. (2011), *Low fertility in Europe. Is there still reason to worry?*, RAND Europe, https://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG1080.pdf.

HU Presidency (2011), *Territorial Agenda of the European Union 2020: Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions,* http://www.eu2011.hu/files/bveu/documents/TA2020.pdf.

Institutul Naţional de Statistică (2013), *Transportul portuar de marfuri si pasageri în anul 2012*, Bucureşti.

Institutul Naţional de Statistică (2015), http://statistici.insse.ro/shop.

Jenson, Jane (2010), *Defining and measuring social cohesion*, Commonwealth Secretariat, United Nations Research Institute for Social Development, https://www.files.ethz.ch/isn/151856/Jenson%20ebook.pdf.

Leimgruber, W. (2004), Between Global and Local. Marginality and Marginal Regions in the Context of Globalization and Deregulation, Aldershot, Ashgate.

Lo Monaco, Mario (1982), *I sistemi economici, in Mario Lo Monaco (a cura di)*, Appunti di Geografiaeconomica, Roma, Kappa, pp. 7–43.

Luukkonen, J. (2010), *Territorial cohesion policy in the light of peripherality*, The Town Planning Review, **81** (*4*), doi:10.3828/tpr.2010.12.

Medeiros, E. (2011), *Territorial Cohesion: a conceptual analysis*, CEG-IGOT – Lisbon University, Alameda da Universidade.

Ministerul Dezvoltării Regionale şi Administraţiei Publice (2014), *Strategia de Dezvoltare Teritorială a României. România policentrică 2035: Coeziune şi competitivitate teritorială, dezvoltare şi şanse egale pentru oameni*, http://sdtr.ro/upload/sdtr-28.08.pdf (accessed January 2018).

Mitrică, Bianca, Damian, Nicoleta, Mocanu, Irena, Şerban, Paul, Săgeată, Radu (2016), *Technical-urbanistic infrastructure in the Romanian Danube Valley. Urban vs. Rural territorial disparities*, Geographica Pannonica, vol. **20**, issue *4*, pp. 242–253.

Nancu, Daniela, Mitrică, Bianca, Mocanu, Irena, Persu, Mihaela (2015), *Population dynamics in the Romanian Danube Valley. Geographical aspects of the young population – labour relations*, Agricultural Economics and Rural Development, New Series, Year **XII**, no. *2*, pp. 157–173.

Prezioso, Maria (2008), *Cohesion policy: methodology and indicators towards common approach*, Romanian Journal of Regional Science, vol. **2**, no. *2*, pp. 1–32.

Prezioso, Maria, *Regional Territorial Cohesion: What indicators for an EU Sustainable Perspective?*, in Proceedings of 48th Regional Science Association Congress, paper no. **172**, Sustainable development and regional economic strategies Session, Liverpool, 2008.

Prezioso, Maria (2006), *STeM approach for a sustainable territorial development of the Lisbon strategy*, in ERSA 46th European Congress – ESPON Special Session, Volos, agost–sept.

Traşcă, Daniela Livia, Aceleanu, Mirela Ionela, Sahlian, Daniela (2013), *Eficienţa în plan teritorial a politicii de coeziune în România*, Economie teoretică şi aplicată, **XX**, no. *1*(578), pp. 64–74.

United Nations (2018), *Sustainable development knowledge platform,* http://www.un.org/esa/sustdev/natlinfo/indicators/ methodology_sheets/demographics/dependency_ratio.pdf.

Varga, A. (2013), *Economic impact evaluation challenges posed by the new European Union cohesion policy: a rationale for the geographic macro and regional policy impact modeling approach*, in: Kovács Ilona Pálné, Scott J., Gál Z. (Eds.), *Territorial cohesion in Europe*, Institute for Regional Studies, pp. 85–98.

Wallace Claire, Abbott Pamela (2009), *Social quality in Europe*, University of Aberdeen, https://www.abdn.ac.uk/ socsci/documents/CINEFOGO_Social_Quality_in_Europe.pdf.

Waterhout, B. (2008), *The Institutionalisation of European Spatial Planning*, IOS Press, Amsterdam.

World Bank, Social Development Department (2000), *New path to social development. Community and Global Networks in Action*, https://siteresources.worldbank.org/INTRANETSOCIALDEVELOPMENT/Resources/NewPathsSocialSummit.pdf.

Zsibók, Zsuzsanna Márkusne (2013), *Methodologies to measure the impacts of territorial cohesion policies – what's new in Brussels?*, in: Kovács Ilona Pálné, Scott J., Gál Z. (Eds.), *Territorial cohesion in Europe*, Institute for Regional Studies, pp. 99–108.

***INTERCO Indicators of territorial cohesion*, ESPON 2011, https://www.espon.eu/export/sites/default/Documents/ Projects/ScientificPlatform/Interco/INTERCO_Interim_Report.pdf.