

Public Infrastructures of Romania's Counties

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Abstract

The article deals with the main aspects of public infrastructures - transport in all its categories, communications, energy and digital - existing in Romania at the county level and, when statistical data are not detailed on them, at that of the eight development regions. The conclusion of the analysis is that the current state of the mentioned infrastructures depends, in particular, on the natural conditions and the previous, historical, development of the counties, and that from the point of view of this state the most developed counties cannot be clearly differentiated from the least developed ones

Keywords: *transport infrastructures; communication infrastructure; energy infrastructure; digital infrastructure*

JEL Classification: *L86; L92; L93; L94; L96.*

Introduction

The main goal of the regional policy followed by Romania, inscribed on the coordinates of the corresponding one adopted at the level of the European Union, is to reduce to annulment the existing territorial disparities which, in our country, are considerable both between the eight development regions and between the component counties of each region.

Disparities are determined by a number of factors - natural conditions (land, climate, soil), natural resources, population, demography, population occupation, structure of economic activities, infrastructures, educational and scientific & innovative potential; all of these factors constitute location advantages which, depending on their quantitative and qualitative level, attract more or less intense domestic and foreign investment capital.

Transport, communications, energy and digital infrastructures are a factor that gives the regions much differentiated location advantages. Indeed, the existence of dense infrastructures and modern transport and communications equipment, availability of significant energy production, transport and distribution, as well as state-of-the-art digital networks ensure low costs and tariffs for consumers - companies, institutions and households -, which materializes the location advantages related to these infrastructures.

Existing infrastructures in counties have the double quality that they are a cause of their development (in the sense that they represent a convincing argument for investors to place their capital in one county or another) and an effect of this development (the more a county is

developed, the more it has more human, financial and expertise resources available to invest in the development and modernization of its own infrastructure).

The synthetic presentation of the information about the mentioned infrastructures in the first five most developed counties of Romania (thus assessed according to the level of the GDP / inhabitant indicator registered in 2018) and in the last five least developed counties is further made.

Transport Infrastructures

Road transport

The length and density of existing public roads in the selected counties are presented in the following table.

Table 1. Length and density of existing public roads in the selected counties, on 31/12/2018

County	Length of public roads (km)	Density of public roads (km/100 km ²)
Cluj	2828	42,4
Timiș	3200	36,8
Constanța	2392	33,7
Brașov	1631	30,4
Ilfov	806	51,5
Giurgiu	1185	33,4
Vaslui	2203	41,4
Botoșani	2561	51,4
Teleorman	1560	27,0
Suceava	3145	36,8

Source: NIS. Length of transport routes at the end of 2018, Bucharest, 2019, pp. 14-15.

The distribution of the public road network on the national territory is sufficiently balanced, despite the very varied relief forms of the counties, so that from this point of view the developed counties cannot be distinguished from the less developed ones. Thus, Botoșani County has a density of public roads clearly higher than that of the developed counties present in the table (except for Ilfov County), this favorable feature not however preventing it from having a low level of economic development.

What is common to all counties is the deficient state of most public roads, the lack of highways including the major European transport corridors, and the insufficiency of the public road network in relation to the requirements of intensifying and diversifying economic activities. In addition, these chronic deficiencies prevent counties with appreciable tourism potential to properly utilize it.

This unfavorable situation is the result of the lack in the last three decades of investments necessary to connect with highways, national and county roads of all regions and counties of the country within the national territory and with neighboring countries.

Railway transport

The country's railway network also has a balanced configuration in the territory, as a result of investments made over the decades to expand it. The lack of investment needed in the last three decades to modernize the existing network has caused its exploitation to present numerous malfunctions, materialized in the drastic reduction of commercial speed in rail transport of people and goods.

Table 2. Length of rail lines and their density in the selected counties, on 31.12.2018

County	Length of rail lines (km.)	Of which: electrified (km.)	Density of rail lines (km./1000 km ²)
Cluj	239	128	35,8
Timiș	795	113	91,5
Constanța	776	85	109,2
Brașov	353	184	65,8
Ilfov	180	180	115,1
Giurgiu	47	36	13,3
Vaslui	249	-	46,8
Botoșani	161	-	32,3
Teleorman	227	68	39,2
Suceava	526	248	61,5

Source: NIS. Length of transport routes at the end of 2018, Bucharest, 2019, pp. 10-11.

The length of the existing rail lines in the selected counties does not clearly separate the developed ones from the least developed ones, but from the point of view of density the situation is favorable for the first category, except for Cluj county, while in the second category Suceava county has a relatively high value of this indicator.

Among the selected developed counties, Ilfov has the highest density of the railway network due to its proximity to the Capital, the surface of the county being crossed by all the railways that radiate from the Capital to the entire territory of the country. Cluj and Brașov counties have, surprisingly, the railway network much smaller in length and density compared to the other counties selected in the same category, but this situation did not prevent them from achieving an intense economic development before and after 1989.

River and naval transport

Romania's hydrographic network is dense and with flows of watercourses generally sufficient for the consumption of the population, the economic agents and the institutions.

Most counties enjoy a favorable position in the vicinity of the Danube or the rivers and waterways or the Black Sea. The counties in the south of the country (Caraș-Severin, Mehedinți, Dolj, Olt, Teleorman, Giurgiu, Călărași, Constanța) flank the Danube, fully benefiting from this neighborhood; along the river there are five ports and five border crossing points.

Constanța County includes three ports on the Black Sea (Constanța, Agigea, Mangalia), of which the first is the largest with containers and an important point in the European intermodal transport network, located on trade routes between Europe and the Middle East.

Aerial

Many counties benefit from aero-port infrastructure:

- 15 international airports - Arad, Bacău, Bihor, Bucharest (2), Cluj, Constanța, Dolj, Iași, Maramureș, Mureș, Satu Mare, Sibiu, Suceava, Timiș;
- 1 airport for domestic flights - Tulcea.

Still exists:

- 1 non-functioning airport - Caras Severin;
- 5 airports under different construction phases - Alba (2), Bistrita, Brasov, Galati.

Communication Infrastructure

In modern society, the communication structure is vital, as it ensures high operations' quality and superior business efficiency, the effectiveness of the activity of public and private institutions, the comfort of people, in a word, the development of society's life in superior conditions.

The accentuated lag of the communication infrastructure in Romania in the last period of the centralized economy regime was largely recovered during the transition period and, especially, in the post-transition period. As there are no detailed data on communication infrastructure by county, we have to limit ourselves to presenting statistics at the level of the eight development regions in Romania, which shows that there are significant regional disparities in this regard, but not always to the detriment of the less developed regions and counties, as shown by the indicator The total number of connections to fixed telephony services, detailed by region and shown in the following figure.

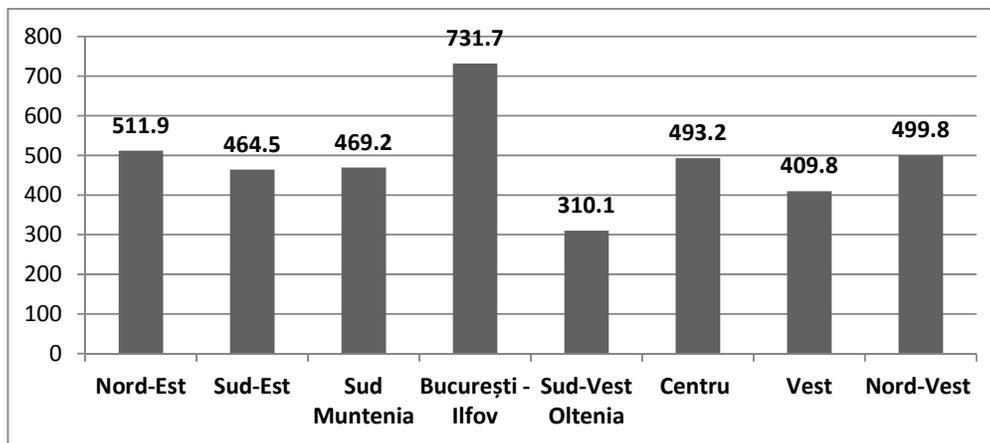


Fig. 1. Total number of connections to fixed telephony services at the end of the year, by development regions, 2017 (millions)

Source: NIS. Romanian Statistical Yearbook 2017, Table 17.26., Bucharest, 2018

The number of fixed telephony connections, which vary widely between regions, must be related to the number of mobile telephony connections, i.e. the number of mobile phones owned by the inhabitants of the regions, but for the latter two indicators there are no statistical data.

Energy Infrastructure

The natural resources of the sub-soil such as coal and hydrocarbons determine the structure of production capacities of the counties depending on the type of fuel used: thus, Gorj county has energy groups running on coal; counties in the Centru development region have hydropower plants and plants running on hydrocarbons; Constanța County owns the Cernavoda Nuclear Power Plant with an installed capacity of 1400 MW and a considerable park of wind farms.

The power installed in the selected counties varies widely over total and renewable energy sources, according to the figures in the following table.

Table 3. Total power available by counties and by types of renewable energy sources, January 2020 (MW)

Energy source	CJ	TM	CT	BR	IF	GR	VS	BT	TR	SV
Biomass	20.250	-	-	-	-	0.526	-	-	-	57.825
Cogeneration	0.633	11.746	-	114.892	-	17.604	-	-	31.150	-
Photovoltaic	94.401	60.909	6.668	289.688	12.303	205.100	0.040	3.283	114.586	0.752
Hydro	13.012	0.090	-	15.609	-	7.380	-	0.800	-	8.883
Classic power plants	2.910	-	-	-	-	3.480	-	12.600	-	1.200
Biogas	-	0.841	0.350	-	-	-	0.500	-	1.695	2.978
Wind	0.585	-	2552.477	-	0.025	-	413.430	0.030	-	0.600
Geothermal	-	-	-	-	-	-	-	-	-	-
Total	131.791	73.586	2.559.495	420.189	12.328	234.090	413.970	16.713	147.431	72.238

Source: Transelectrica. Total power by counties and by type of energy source, Bucharest, 09.03.2020

Note: Counties CJ – Cluj; TM – Timiș; CT – Constanța; BR – Brăila; IF – Ilfov; GR – Giurgiu; VS – Vaslui; BT – Botoșani; TR – Teleorman; SV – Suceava.

The size of the total power available in the selected counties and the diversity of renewable energy sources used for its production depend, mainly, on the existing natural conditions in each county, but also on the involvement of local authorities in the process of identifying those sources and creating the necessary conditions for their efficient exploitation (primarily attracting investment and orienting them towards exploitation of available sources).

Depending on these springs, first of all the natural conditions that determine the existence of certain renewable energy sources in each of the selected counties, their profiling on such types of energy is as follows:

- wind - Constanța și Vaslui counties;
- photovoltaic - Timiș, Cluj, Brașov, Teleorman counties (the last two counties also on cogeneration);
- biomass - Suceava county.

Ilfov and Botoșani counties have the lowest values of total available power from renewable energy sources, the first county focusing on photovoltaic energy, and the second on energy from classical power plants.

Regardless of the performance and profiling of selected counties on renewable energy sources, the efforts of the local governance and their citizens for the diversification and adequate capitalization of the available resources are to be appreciated, this being an effective spring for the efficiency of the economic activities carried out in the counties and, implicitly, for their development.

Digital Infrastructure

According to the Digital Economy and Society Index (DESI) indicator published by the European Commission in June 2019, Romania ranks penultimate in the hierarchy of the 28 member countries established according to this indicator. DESI is a composite indicator that synthesizes indicators on Connectivity, Human Capital, Use of Internet Services, Digital Technology Integration, Digital Public Services.

The mentioned hierarchy is led, in descending order, by Finland, Sweden, the Netherlands, Denmark. It should be noted that the member countries with the largest economies in the European Union - Germany, France, Italy, Spain - occupy positions in the middle of the hierarchy (except for Italy, which ranks 24th) (DESI, 2020).

As there are no national and EUROSTAT statistics on the digital economy and society at county level, we have to present data available for Romania and for its eight development regions, which shed a sufficiently edifying light on the state of these areas in the selected counties.

Romania's situation regarding the DESI level and its components in 2017, 2018 and 2019 is summarized in the following table.

Table 4. The level of DESI and its components for Romania, 2017.... 2019

	Year	Romania		UE Scoring
		Place in the hierarchy	Scoring	
DESI	2019	27	36,5	52,5
	2018	27	35,4	49,8
	2017	28	32,0	46,9
1. Connectivity	2019	22	53,5	59,3
	2018	19	52,5	54,8
	2017	23	45,2	51,2
2. Human capital	2019	27	31,1	48,0
	2018	28	31,5	47,6
	2017	27	30,2	45,4
3. Use of internet services	2019	28	31,9	53,4
	2018	28	28,5	50,7
	2017	28	23,8	47,8
4. Digital technology integration	2019	27	20,5	41,1
	2018	27	20,1	39,6
	2017	27	23,3	37,6
5. Digital public services	2019	28	43,2	62,9
	2018	27	40,4	57,9
	2017	26	36,5	54,0

Source: reproduction from the European Commission. Digital Economy and Society Index (DESI). Country report from 2019. Romania <https://ec.europa.eu/digital-single-market/en/desi>

Note: The indicators of the components on the basis of which the DESI is determined are presented in detail in the cited paper.

We insist on the aspects of the digital economy and society in Romania and detail them, without reaching the level of counties, because the rapid development of the Romanian economy and society, implicitly of its counties, depends, decisively, on the swiftness of the progress in building this new type of society, corresponding to the current state of world science and technology.

Romania's performance in terms of digitization is still modest, as shown in the previous table, despite significant progress in the last decade, with a handicap difficult to overcome without strong acceleration of measures to reduce it progressively. The detailing of the level of some indicators by development regions compared to the one registered by the leading country of the mentioned hierarchy, provides an eloquent picture on the lagging behind of our country, highlighted by the figures in the following table.

Table 5. Dynamics of the level of relevant indicators regarding the digital economy and society in Romania and its development regions, compared to Finland, 2007 2019

Indicators	Year	Finland	Romania	Development regions							
				N W	C	NE	SE	S	BI	SW	W
% of population with access to the internet at home	2019	94	84	87	84	80	79	80	91	84	88
	2015	90	68	72	68	61	60	62	82	65	76
	2010	81	42	42	40	36	39	36	67	35	47
	2007	69	22	:	:	:	:	:	:	:	:
% of households with broadband access	2019	93	82	85	80	77	77	79	91	83	87
	2015	90	65	70	65	57	57	61	80	62	75
	2010	76	23	28	23	17	23	23	33	15	22
	2007	63	8	:	:	:	:	:	:	:	:
% of individuals who have never used a computer	2017	4	27	24	28	33	33	37	10	31	19
	2015	4	30	31	27	33	35	37	15	37	22
	2010	8	51	48	48	53	57	58	35	55	44
	2007	13	58	:	:	:	:	:	:	:	:
% of individuals who used the internet daily	2019	90	57	65	57	49	53	54	63	55	60
	2015	84	37	38	38	30	31	33	55	31	41
	2010	72	21	:	:	:	:	:	:	:	:
	2007	62	12	:	:	:	:	:	:	:	:
% of individuals who used the internet for interaction with public authorities (last 12 months)	2019	87	12	11	13	9	9	8	21	13	11
	2015	79	11	10	13	6	8	7	22	12	11
	2010	68	8	:	:	:	:	:	:	:	:
	2008	62	:	:	:	:	:	:	:	:	:
% of individuals who ordered goods or services over the internet for private use (last 12 months)	2019	73	23	29	27	18	19	20	31	22	23
	2015	69	11	14	9	9	7	11	19	9	8
	2010	59	4	2	5	3	3	2	8	3	4
	2007	48	3	:	:	:	:	:	:	:	:
% of individuals who accessed the internet away from home or work	2019	:	70	77	66	69	64	69	74	69	71
	2015	73	38	40	38	28	36	32	53	35	44
	2012	56	7	6	7	7	8	5	16	3	8

Source: EUROSTAT. Regional digital economy and society (reg_isoc).

Note: Development regions NW – North-West; C – Center; NE - North-East; SE – South-East; S- South Muntenia; BI – Bucharest-Ilfov; SW – South-West Oltenia; W – West.

The dynamics of the level of indicators included in the table highlights the appreciable progress made by Romania as a whole and by its development regions, especially after 2007, in the gradual building of the digital economy and society. On all indicators, the negative gaps with Finland have narrowed sharply, the pace at which they have diminished justifying the prospect of their further reduction.

The statistical data presented at the level of development regions do not naturally highlight the sometimes large disparities between the component counties, but still provide a sufficiently relevant picture of the common progress of these counties. From this perspective, it should be noted that the negative differences registered by the less developed regions compared to the national average are within quite narrow limits. Instead, the gaps between Romania and Finland are worrying given their magnitude in indicators regarding the share of the population that does not use the Internet, the share of individuals who use the Internet daily, the online interaction of individuals with public authorities, the online order of goods and services.

Conclusions

Infrastructures - transport, communications, energy, digital - do not separate the most developed counties from the least developed ones, the extension and quality of these infrastructures depending on the natural conditions and the previous economic development of the counties.

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