

THE IMPACT OF THE TERRITORY'S PUBLIC INFRASTRUCTURAL LEVEL ON THE ORGANIZATION OF THE TERRITORY IN THE REGHIN MICRO – REGION

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Abstract. Territorial infrastructures influence the way a territory is economically realized being the support of this process through density, typology and spatial configuration of these infrastructures. On their own turn, these infrastructures are influenced by the configuration of the relief, the hydrographic system, the position of the resources in the substrate and on the surface; the position of the natural reservations and protected areas, settlements, etc., that is the natural and human factors of the geographic space which determine the spatial configuration and the rank of the territorial infrastructures. The rank of the territorial infrastructures and the degree of modernization of these constitutes a factor of orienting, stimulation or inhibition of the spatial development. All the elements which sustain and facilitate public services and the relation between these constitute public infrastructure; public infrastructure is the support for assuring and carrying on the public services; the rank of infrastructural level often gives the economic function of the settlement. The non – homogeneous territorial distribution of the infrastructure determines the apparition of certain areas of concentration, also known as “central areas” or polarizing centers, and the apparition of certain polarized centers or “peripheral areas” which through the relations that exist between them give the dynamics of the territorial system. The natural structure of the Reghin micro – region strongly influences the localization of the polarizing area with major consequences on the organization of the micro – regional territory.

Rezumat. Impactul teritorial al nivelului infrastructurii publice asupra organizării teritoriului în microregiunea Reghin. Infrastructurile teritoriale orientează modul de valorificare economică a oricărui teritoriu, constituind suportul acestui proces prin densitatea, tipologia și configurația spațială a acestora. La rândul lor, infrastructurile sunt influențate de configurația reliefului, rețeaua hidrografică, poziția resurselor solului și subsolului, a rezervațiilor și ariilor protejate, a așezărilor etc., adică de valențele naturale și antropice ale spațiului geografic ce determină configurația spațială a infrastructurilor teritoriale și rangul acestora. Rangul infrastructurilor teritoriale și gradul de modernizare a acestora constituie un factor de orientare, stimulare sau inhibare a dezvoltării spațiale. Totalitatea elementelor care susțin și facilitează desfășurarea serviciilor de interes public și relațiile dintre acestea se constituie în infrastructura edilitară; dotările de interes public reprezintă suportul asigurării și desfășurării serviciilor de interes comunitar, rangul dotărilor conferind adesea și funcția economică a localității. Repartiția neomogenă a acestora în teritoriu determină apariția unor areale de concentrare, cunoscute ca „locuri centrale” sau centre polarizatoare și implică a unor centre polarizate sau „areale periferice” care, prin relațiile ce le instituie între ele, conferă dinamică sistemului teritorial. Structura naturală a microregiunii Reghin influențează puternic localizarea ariei polarizatoare, cu implicații majore asupra organizării teritoriului microregional.

Keywords: *public infrastructure, level of infrastructure, polarizing center, force of attraction.*

Cuvinte cheie: *infrastructură edilitară, grad de dotare, centru polarizator, forță de atracție.*

Territorial infrastructures -” *the total of systems and technical networks and the installations related to these, developed at the surface of the soil, of waters or underground with a role in assuring access, transportation and communication between different points of a territory, which appear in the social – economic activities – constitutes the skeleton of regional development.*”¹

Whenever the development of a settlement is wanted or the implementation of an economic objective the parallel development of a technical infrastructure must be considered which should support the desired economic change. Through the development of a territorial infrastructure it is possible to introduce new areas in the economic circuit by connecting them to the existing economic and settlement systems.

On the one hand if we take into account the actual form of organization of the economic space and the fact that socio – human systems are open ones we can state that territorial infrastructures represent the geo – spatial component which assures and sustains the existence of these geosystems.

On the other hand the lack of such infrastructures of their poor quality has negative consequences on that territory: this might change from central area to a peripheral one with divergent fluxes, especially a divergent flux of population.

Territorial infrastructures direct a region's economical management, being the foundation of this process through density, typology, and spatial configuration. On their turn, infrastructures are influenced by the configuration of the landscape, the hydrographic system, the position of the resources, reservations and protected areas and settlements, in other words the natural and human factors of the geographical space which determine the configuration and rank of the infrastructure.

The rank of infrastructure and the degree of modernization of these constitutes a factor of orienting, stimulating or inhibiting spatial development.

*“Consequently, the development of a territory depends primarily on the state, rank and degree of development of the territorial infrastructures. These are the first to be implemented in a territory and further dictate the development of the other human components (settlements, the economic management of the territory, the forms of conservation of the environment, etc). From this perspective in the territorial development strategies and in the directing of structural funds a priority should be investment in the infrastructure and investments in the other components should follow.”*²

Public infrastructure is the total of elements that sustain and facilitate the carrying on of public services and the relations between them; the existence of such an infrastructure as modern and diverse as possible, assures a high living standard for the population of the settlement; in this respect we should mention the existence of water supply systems, sewage systems, natural gas supply systems, public power supply systems, the degree of connection to the power supply system of the households and household service.

¹ The Plan of Zonal Territory Management, Bistrita (2005), p. 103, www.primariabistrita.ro

² Cocean P., *The planning of peripheral territories*, Editura Presa universitară Clujeană, Cluj-Napoca, 2007.

The centralized systems of water supply and sewage in the Reghin³ micro – region had four major differences in July – August 2009: existing, non – existing, the stage of works had been done; the studies of feasibility had been done.

In this respect the city of Reghin is excluded as 80% of the households are connected to the centralized systems of water supply and sewage. The water supply is assured permanently by the underground source of Voivodeni, through 14 wells with a 20l/s flow capacity and through the catching of water on the surface (a dam on the Gurghiu river) with a 380 l/s flow capacity.

The analysis of the rural area shows the favourable situation of the central area, on a N- S direction, overlapping the valley of the Mures river; there are two areas of very poor or non – existent infrastructure, in the western part, a high plain area (Cozma village) and in the south – east (Beica and some villages near Gurghiu and Ibanesti) (See Fig. 1).

Table 1. The centralized public water supply system of Reghin

Settlement	Number of households	Type of water supply						
		Total	Equipment of supply in the house		Equipment of supply outside the house			
			From the public network	From private system	Inside the building		Outside the building	
					From public network	From private system	Public network	Private system
REGHIN	10.409	10222	9562	127	138	34	222	139
The other settlements of the TAU	2097	1860	1214	70	21	9	172	374

Source: PATJ Mures, 2009

Table 2. The source of water supply in the rural area

Settlement	Source of supply
Gurghiu	Gurghiu river
Hodac	Isticeu stream, Gurghiu river
Ibănești	springs, Gurghiu river
Brâncovenești	Mureș river
Deda, Aluniș	Bistra stream
Solovăstru, Lunca, Breaza, Suseni	RAGCL network Reghin
Vătava	Underground sources
Răstolița	Local sources
Rușii-Munți	Bistra stream

³ Area defined on the basis of territorial gravitation (or that of interaction) Reilly – Converse, 21 villages in Mures county and a county capital.

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Chiher	Local sources
Voivodeni	Underground sources

Source: PATJ Mures, 2009

The network of sewage is unequally distributed in the two areas, county capital Reghin is again an exception and more than 80% of the households are connected to the system.

Table 3. The situation of the sewage system in Reghin

Settlements	Total households	Equipment of sewage in the household			
		Total	Public network	Private system	Other situation
REGHIN	10409	9689	8153	1359	177
The other settlements of the TAU	2097	1284	829	436	19

Source: PATJ Mures, 2009

The water purification station of Reghin is under the management of RAGCL Reghin and was built in 1974.

Primary elutriation is realized by two radial clarifying tanks which assure 100% the requirements of particle retention through elutriation.

Secondary elutriation is realized after water has been aired by two longitudinal clarifying tanks and two radial clarifying tanks which assure 100% the secondary elutriation.

In the rural area only Deda and Gurghiu have public sewage systems: Deda with a constant length of 2.1 km between 1992 and 2005, Gurghiu with a constant length of 1.9 km, in both cases insufficient for all the households.

Being situated in the county of Mures, Reghin has a privileged situation as far as natural gas supplies are concerned, since the county of Mures has the most developed system of methane distribution on national level and is the main producer of natural gas in Romania, supplying 60% of the total extracted in Romania.

The most important settlements where there is gas extraction are Sărmaş, Sărmăşel, Ulieş, Sânmărtin, Crăieşti-Ercea, Zau de Câmpie, Luduş, and in the micro – region there is extraction at Lunca; these are exploited by the Regionala Gaz Metan (ROMGAZ) Mediaş, Schela Târgu Mureş.

The fact that the natural gas source is situated in the central – western part of the region has a decisive impact on the spreading of the distribution system; thus settlements with centralized gas supply systems are grouped in the central – southern part of the micro – region, including the urban centre and a nearby villages: Batoş, Lunca, Breaza, Voivodeni, Petelea, Solovăstru, Gurghiu, Ideciu de Jos, with an impact on the economic development of these trough creating the necessary conditions for the apparition of industrial units (for example the fowl farm in Gurghiu). (See Fig. 2).

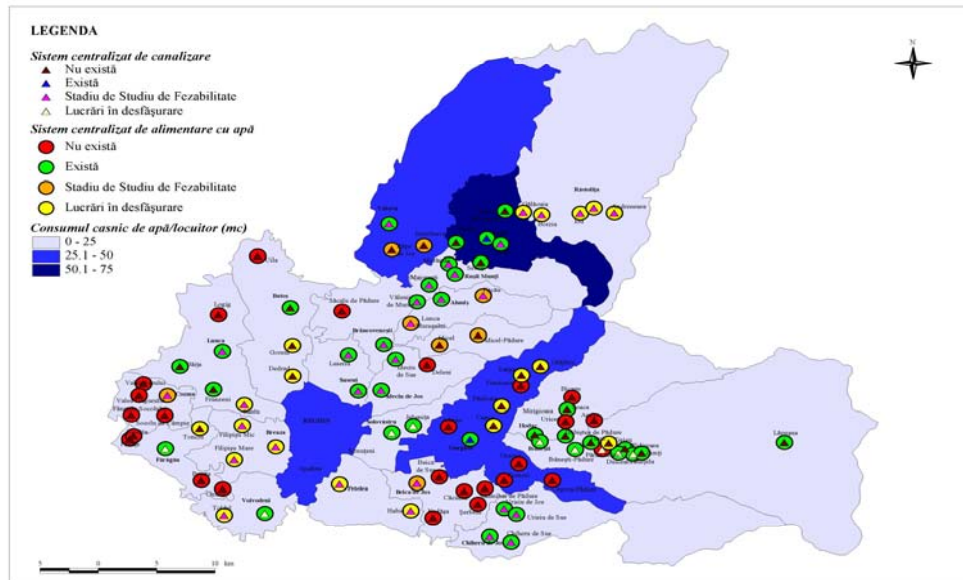


Fig. 1 Water supply and sewage systems in the rural area

Public lighting and the degree of electrification of the households does not bring major differences in the degree of public infrastructure of the settlements, the average degree of electrification of settlements is over 90% and public lighting service exists in all the settlements.

The organization of *household* service had been realized by the local authorities of each settlement in 2009, for this service money was assured at the chapter of Protection of the environment from the expenditure section of the local budget. Until July 2009 the transportation of household garbage was done with trucks or carts in Faragau; motorized utilities are represented by cars non-licensed for the transportation of garbage, but which have been more or less adapted for the purpose; collecting is done once a week directly from the households, depositing is realized in specially created spaces – cesspool – but with minimal equipment (railed areas), usually under the management of the local authority. Household service has a higher quality in Reghin as far as transportation is concerned, which is assured by licensed vehicles, but collecting is also done once a week, a very reduced frequency, especially for the neighborhoods of blocks of flats where there are not enough rollaway bins, thus determining the accumulation of garbage near these in open space.

The appropriate manifestation of public services in the territory is facilitated by the existence of the public infrastructure, the existence of “building or specially adapted spaces for diverse purposes, capable to satisfy public needs.”⁴

From the point of view of purpose, the frequency of usage and rank there are several categories of public infrastructure⁵:

⁴ V. Surd, “The geography of settlements”, The geography of settlements, edit. Presa Universitară Clujeană, Cluj-Napoca, 2004, p.44.

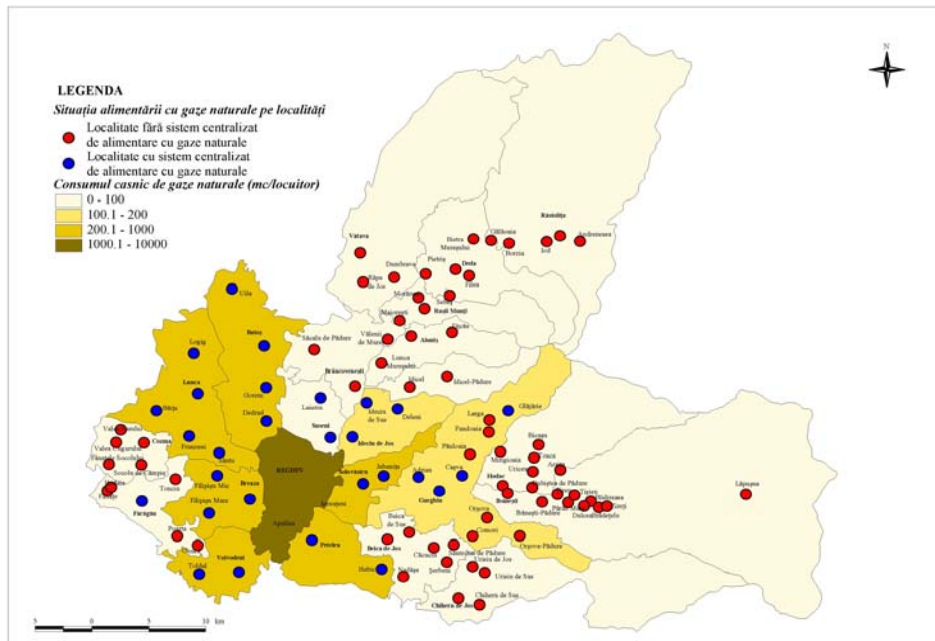


Fig. 2. *The level of distribution of the centralized gas supply system in the rural settlements*

- From the point of view of purpose there is the public infrastructure for education, culture and religion (schools, museums, monasteries, etc.), public infrastructure for administration (town hall, police station), sanitary infrastructure, infrastructure of production, commercial infrastructure, transportation and telecommunication infrastructure (post offices, railway stations) special infrastructure (banks, firefighter station).
- From the point of view of frequency of usage there is infrastructure with daily usage (schools and the infrastructure of production), with current frequency (commercial and administrative), periodical frequency (churches), occasional frequency (hospitals, police stations);
- From the point of view of territorial frequency, type and quality public infrastructure is categorized by rank, sub – village rank (elementary schools), characterized by high frequency of usage and a wide territorial spreading, village rank (town hall) and super – village rank (high schools and restaurants) with a narrower territorial spreading. In the category of superior infrastructure fall those with occasional usage such as hospitals, court houses; these offer high quality services and their territorial

⁵ V. Surd, “The geography of settlements”, The geography of settlements, edit. Presa Universitară Clujeană, Cluj-Napoca, 2004, p.44.

spreading is reduced, the settlement with such infrastructure being a polarizing center for the nearby region.

The settlements of the Reghin micro – region have diverse public infrastructure and various level of spreading of this infrastructure, determined by the population and its needs, with influence on the position this settlement occupies in the system of settlements of the region.

As the only urban settlement of the region, Reghin concentrates the most of this infrastructure, more varied and of superior quality.

Infrastructure for education, culture and arts adds up to 19 educational institutions, 15 libraries and a museum.

Table 4. Educational infrastructure in Reghin, 2007.

	Number of units	Pupils enrolled	Staff
Kindergartens	9	1430	96
Elementary and secondary schools	5	3212	209
High schools	3	2531	186
Technical schools	1	812 ⁶	35
Colleges	1	345	6
Total	19	6900	530

Source: Statistical file of Reghin, 2007

In the county capital there are 15 libraries but only one is public: The “Petru Maior” County Library, with 102,000 volumes; and the Ethnographic Museum. In the city there is the “dr. Eugen Nicoara” Culture House with 420 seats and the “George Enescu” Youth House. Besides the educational function of high schools and technical schools this youth house gives the city a cultural function polarizing the secondary school graduate youth along with Deda and Gurghiu, each with a high school.

Among administrative infrastructure we should mention the county council, the county capital city hall, where the services for population evidence, passports, vehicle management, driving license departments function; there is the county capital police department, local police departments, the fire department, the court house, the headquarters of political parties.

Sanitary infrastructure for the urban population (named as such, because these exist in rural settlements as well) is made up of 95 units: a clinic, a medical cabinet in the school, private surgeries, dentist’s, specialized surgeries, a nursery school, GP surgeries and pharmacies.

Along these units there is sanitary infrastructure which is only present in the city and not in the rural area as well, such as hospitals, emergency units, medical laboratories and dental technology laboratories These give Reghin the medical function, thus polarizing the entire micro – region.

Table 5. Sanitary infrastructure in Reghin, 2007

	Public	Private	Total
Hospitals	1	0	1

⁶6 students enrolled in a superior level according to the Fișa municipiului Reghin, 2007.

Clinics	0	4	4
Emergency units	1	0	1
Surgeries	1	0	1
School surgeries	1	0	1
Private surgeries (general and family medicine)	13	11	24
Specialized surgeries	16	34	50
Pharmacies	1	15	16
Dentist surgeries	5	13	18
Nurseseries	1	0	1
Medical laboratories	3	2	5
Dental technology laboratories	0	7	7

Source: Statistical file of Reghin, 2007

In Reghin there is the “Dr. Eugen Nicoara” County Hospital, with 6 departments⁷: surgery, internist section, gynecology, pediatry, neo-natal section, contagious diseases section.

In the hospital there is a closed circuit pharmacy for the hospital's departments which issues free prescriptions for those suffering from tuberculosis. Medical assistance is assured by the existence of 3 laboratories (medical analyses, radiology and pathology) with 3 doctors, 2 biologists, 18 medically trained people and auxiliary staff (4 people).

In all the medical units there are 404 people with medical training: 62 doctors, 9 in private practice, 15 dentists, 2 in public practice, 31 pharmacists (1 in public practice) 296 medical personnel, 95 in private practice.

Table 6. Medical staff in Reghin, 2007

	Doctors	Dentists	Pharmacists	Medical staff
Public practice	53	2	1	201
Private practice	9	13	30	95
Total	62	15	31	296

Source: Statistical file of Reghin, 2007

Industrial infrastructure is concentrated in the industrial area of Reghin, developed on the left bank of the Mures River, downstream from the junction with the Gurghiu River. The industrial area is made up of units for processing metals in the north – east, in the east units for processing wood and construction material, in the south food industry.

The main agricultural infrastructure is outside the city, in independent units of the administrative area. Beside the areas of compact production infrastructure, there is a series of infrastructure in the city with mostly service functions (small or medium enterprises).

The main production infrastructure is represented by the large enterprises of Reghin: “Prolemn”, “Alpina”, “IRUM”, “Geosef Levicom”, “Remex”, “Hora”, “Bucin Mob”.

Commercial infrastructure is represented by units with wholesale and retail activity; in Reghin all commercial units are privately owned.⁸ There are three supermarkets: Plus, Billa and Penny Market and a multitude of smaller mini - markets in the neighborhoods;

⁷ www.spitalreghin.ro, data correlated with Fișa municipiului Reghin, 2007

⁸ General Urbanistic Plan, Reghin, 2008

there are also three units which sell furniture, three important centres which sell construction materials (with free home delivery), eight restaurants of different categories, a hotel and five pensions. The average number of employee in the commercial area was 1851 people in 2007.⁹

As far as the infrastructure for transportation and telecommunication is concerned, transportation in Reghin is assured by both publicly and privately owned vehicles. The most important routes of public transport are represented by those between peripheral neighborhoods as Apalina and Iernuteni and the centre of the city, and those between the centre and the industrial area. To assure public transport there are 10 buses, most of them DAC 112.

Public transport in the neighboring area of Reghin is realized through the bus station and the railway station; Reghin is linked to the 405 Line.

The city has only one post office in the central area and 14 points for collecting mail in the main neighborhoods.

The category of special infrastructure includes churches and other buildings with religious use and the fire department's headquarters.

Table 7. The number of people belonging to different religions in Reghin, 2002

Religion	Reghin	Reghin	Apalina	Iernuteni
Stable population	36126	29195	2826	4105
Orthodox	22283	18495	990	2798
Roman - Catholic	3550	2698	452	400
Greek - Catholic	1851	985	769	97
Protestant	7188	5990	541	657
Augustan evangelic	97	96	1	0
Lutheran	112	108	0	4
Unitarian	63	57	1	5
Old rite Christian	1	1	0	0
Baptist	86	57	3	26
Pentecostal	113	70	7	36
Seventh Day Adventist	360	284	29	47
Christian of the Evangelium	39	33	0	6
Moslim	20	20	0	0
Mosaic	6	6	0	0
Other religion	273	223	26	24
No religion	37	32	4	1
Atheist	12	10	1	1
Undisclosed	11	11	0	0

As far as buildings with religious use are concerned there are 8 Orthodox churches, 4 Protestant parishes, 1 Roman Catholic parish, 4 Greek Catholic parishes, 2 Seventh Day Adventist churches, one Pentecostal church and one Baptist church.

Reghin is the coordinating center for emergency situations, there is a professional service for these situations whose activity takes place at the fire department headquarters.

⁹ The file of the settlement, Reghin, 2007

Infrastructure related to finance and banking has become more important over the years and has been constantly spreading taking into consideration the economic activity of the population, not as much for savings but rather for contracting different types of loans. Thus, where there was demand there soon appeared offer; several new banks and insurance companies have appeared. The great majority of banks and insurance companies have built their own headquarters. The most important banking units represented in Reghin are: Banca Română de Dezvoltare, Banca Comercială Română, Banca Raiffaisen Bank, Banca Romexterra Bank, Banca Carpatica, CEC, Banca Transilvania.

Infrastructure in the *rural area* is varied as well though their spreading is not uniform; the access of population is sometimes limited due to the distance.

Maintenance costs and the number of population involved determined certain types of infrastructure to concentrate in certain settlements; the population of the neighboring settlements would have to travel in order to satisfy their needs. Thus appeared and consolidated systems of settlements as “a free association of neighboring settlements, irrespective of their being part of urban or rural areas, between which strong cooperative relations have been formed as a result of differentiated territorial placement of dimensionally and qualitatively unequal functions, and of infrastructure with central role.”¹⁰ The variation of the level of infrastructure, the quality, type and number of it leads to a hierarchy of the settlements and implicitly of the territorial systems resulted from their association.

In the Reghin micro – region the 95 rural settlements individualize 21 systems of rural settlements of the village type. Each village has a set of public infrastructure that is compulsory and generally accepted on national level (town hall, medical unit, elementary /secondary school, post office, a shop and a police station), demographic pressure on these increases with the number of population served. In parallel, certain small villages have supplementary infrastructure with a polarizing role, a fact that contributes to their economic development (pensions, restaurants, railway stations, pharmacies).

In the analysis of town infrastructure and public infrastructure in the studied area we took into consideration the type of infrastructure, the situation of water supply and the elutriation of used water. Based on the questionnaires/interviews we conducted on the field we identified the following categories of infrastructure:

- administrative (town hall, police station);
- educational;
- medical;
- religious;
- commercial;
- touristic;
- other.

In order to have a synthetic situation of micro–regional level of infrastructure on village level there was a hierarchic organization of these on five levels depending on the existence/non – existence of the following: medical unit, kindergarten, elementary school, shop and a post office. We chose these units as they are able to satisfy basic human needs of health issues, education, commercial problems and telegraphic communication as a

¹⁰ V. Surd, “The geography of settlements”, Geography of settlements, edit. Presa Universitară Clujeană, Cluj-Napoca, 2004, p.44, p. 174.

primary form. Every infrastructure got one point, the existence of all giving 10 points, lack of each meaning one point less; thus levels of infrastructure decrease from the maximum 10 points to the minimum 5 points. The territorial distribution of settlements on the basis of infrastructure reveals:

- the concentration of those with all the maximum points in the valley area;
- all village centers fit into this category;
- there are a few settlements, which are not village centers but have all the infrastructure Idicel, Toaca, Dedrad, Luieriu, Săcalu de Pădure, Vălenii de Mureș;
- the concentration of settlements with the minimum level of infrastructure (level 5) in the eastern part of the micro – region, in the valley of the Gurghiu River, and in the western part in the Faragau Hills, where there are the most villages with decreasing population where the investment in the infrastructure is not justified.

As a result of the structural funds granted to Romania for improving the water supply system and the sewage system together with the interest of the state in the matter in 2009 the majority of settlements have a centralized water supply system, there are settlements where the work has been started and others where the study of feasibility has been conducted; thus we can mention the western area, overlapping the village of Cozma and the central – southern area (the village of Beica de Jos, and partly Gurghiu) where there is no centralized water supply system or sewage system. (see Fig. 3)

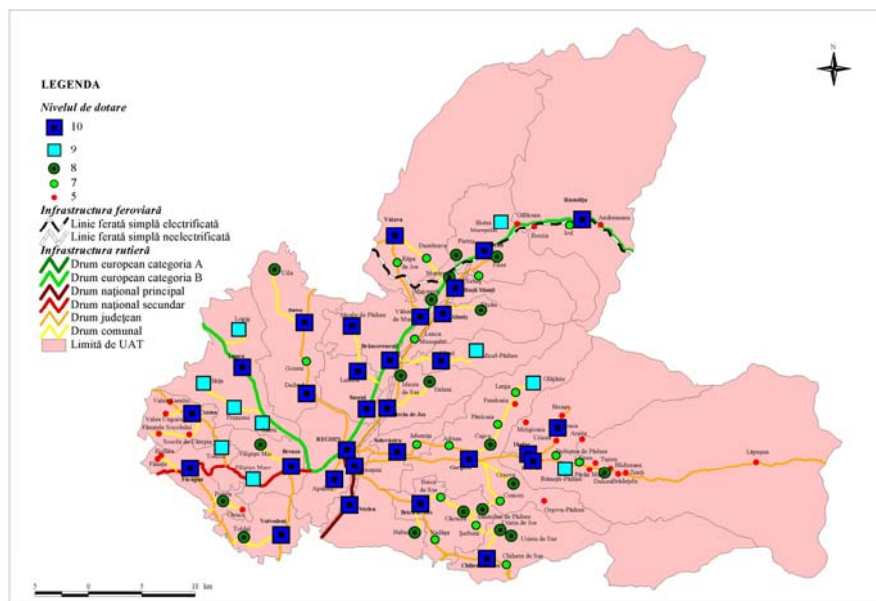


Fig. 3 The level of infrastructure of the settlements

The level of infrastructure of a settlement reflects its degree of development. The higher level of infrastructure the less territorial spreading, the more these polarize population; thus the attraction power of the settlement is felt at a larger distance in territory,

its importance increasing for the population in question, thus the settlement is placed higher in the hierarchy¹¹ of the settlements.

A higher position in the hierarchy is directly correlated with the increasing dominance of the settlement over the neighboring territory, a dominance given mainly by the fact that these settlements offer services for their own population and for the population of neighboring settlements through their infrastructure; obviously in the classification of settlements there are other aspects such as the administrative one or the demographic dimension, depending on the type of classification.

The analysis of the level of infrastructure of the settlement in the studied area permits the individualization of the "central area" of the micro – region overlapping the Valley of the Mures River, an axis which concentrates fluxes of materials, energy and information where the most rural settlements with the highest level of infrastructure are localized. This is where Reghin is situated, the only urban settlement which has a role of micro - regional polarizing center, a role given by administrative, medical, cultural and educational attraction it has.

The position of the city in the southern part of the studied area permitted the apparition of other secondary polarizing centers – Deda, in the Valley of the Mures, in the north; and Gurghiu, in the valley of the Gurghiu river, in the eastern part of the studied area.

On the third level of the hierarchy are the settlements which are village centers followed by the polarized settlements (see Fig. 4).

The differentiated infrastructure of the settlements which give them different economic functions and their positioning in the central or peripheral area of the micro – region determined multiple *relations*. Some of them have a centripetal character others have a centrifugal character.

Centripetal influences give these relations a direction towards the city; among these the most important are:

- Commuting to town because of work: as a result of the concentration of services and industry important groups of people commute on a daily basis from villages towards the city; commuting is strongly influenced by the potential of communication of the region, by the ease of relations with the city and by the distance from it.
- The commercial influence is due to the incapacity of the rural area to entirely supply the demand for household goods, for food and for general things of the population.
- Supplements of food and raw material
- The medical and educational attraction of the urban over the rural is due to the concentration of medical and educational facilities of high quality in the urban area
- The cultural, administrative and legal attraction is due to the positioning of these units in the urban area rather than in the rural area.

¹¹ Hierarchy: an organization or group whose members are arranged in ranks, for example, in ranks of power and seniority

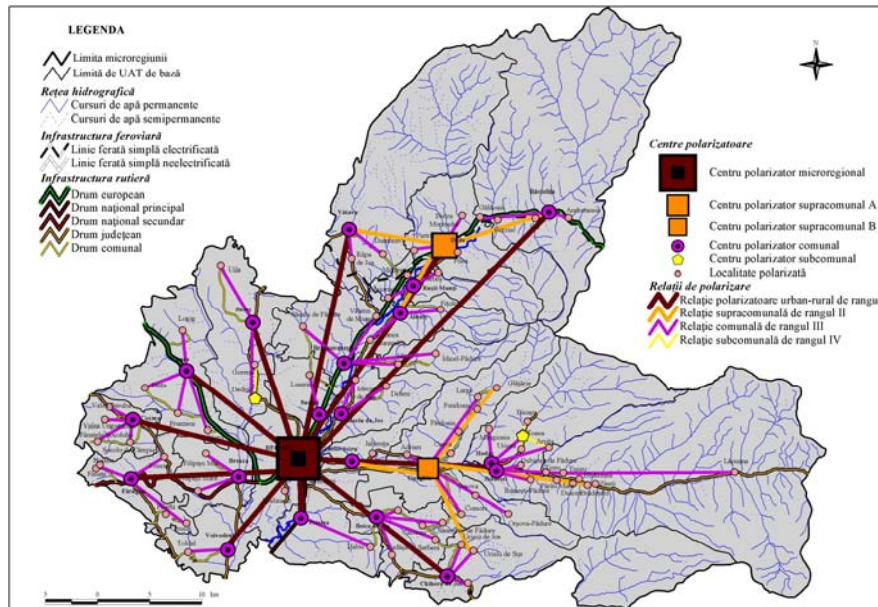


Fig. 4 The micro – regional system of settlements and the relations between these

Centrifugal relations are manifested in:

- Commuting because of work from the town, characteristic for the highly qualified workers.
- The migration of industry towards the rural area due to the incapacity of the city to supply workforce (which eliminates commuting) and to the reduced prices of land in the rural area.
- The political – administrative influence of the urban over the rural is due to the concentration of specialized institutions of the state which serve rural population, in the city.
- Travel and relations for recreation.

The different degree of infrastructure determines the organization of the territory to structure in central areas of attraction, where the level of infrastructure is high, and in peripheral areas, often of refusal as a result of the low level of infrastructure. Thus center – periphery type of relations appear with a centripetal or centrifugal orientation.

The marginal position of the ‘central’ area of maximal development does not permit a uniform polarization of the neighboring territory, thus permitting the appearance of secondary polarizing centers in marginal positions. The relations of such a system appear on different levels, thus making the territorial system even more complex and stable.

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