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PhD thesis

DEVA-HUNEDOARA CONURBATION. APPLIED GEOGRAPHY STUDY

-Summary-

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Content

Key words : conurbation, land use, population dynamics, central place structures, influence in the territory, Deva, Hunedoara, system of settlements.

Introduction

The intense process of urbanization that mankind has witnessed in the last 200 years has created many settlements and groups of urban settlements, causing irreversible changes in the arrangement and organization of the territory. Among the settlements groups conurbations represent a special category, a category born of th necessity for collaboration between two or more settlements in order to offer optimal living conditions for their own residents.

Often ignored or mistaken for urban agglomerations or metropolitan areas, conurbations have been identified in all countries with a high degree of urbanization. For the first time conurbations have been described in the UK, a country with a large urban system, then in France, the Netherlands, Germany, gradually becoming recognized worldwide. In Romania the study of conurbations was long dellayed because the urban network was poorly developed until the early 1950s.

This paper aims to study in detail the Deva - Hunedoara area, refered as „ Deva - Hunedoara conurbation" in order to understand how it was formed, how it works and how it will develop. In the absence of reference works for the Romanian geographic space we consider this paper can become an example regarding how all future Romanian conurbations will be studied.

The study is divided into nine chapters and deals with all matters relating to the emergence, evolution and future development of the conurbation. Of the nine chapters, only the first is theoretical, its role being to familiarize the reader with the concepts presented. The remaining eight chapters are the applied part of the work, studying various issues relating to the evolution of the conurbation, its relief, hydrography, land use, demographic resources, structures with central role up to influence areas.

Finally it needs to be mentioned that in the development of this paper a great deal of work was represented by data collection from various institutions. One should not overlook that this papper can not be classified in one area of study, its not a monographic or statistical work, not a spatial study, not planning or regional geography study, it represents a blending of all of them, becoming a valuable source of information for specialists, researchers, local authorities and not least for the simple people willing to know where they live. That being said I believe that the present work represents the first integrated study of a potential conurbation area in Romania, a study based on the idea that a complex area must be analyzed in depth from different perspectives before implementing any measure spatial planning.

1. Theoretical and methodological basis of organization of geographic space

Conurbation - definition, structure and role in the system of settlements

According to the Oxford Dictionary a conurbation is "an extended urban area formed by the union of the suburbs of smaller cities with a large central city". The etymology of the word comes from the latin *con* (with) and *urbus* (city) meaning cities or towns together, the term is a neologism from the early 20th century.

The conurbation term was first used by the english urbanist Patrick Geddes in his book "Cities in evolution". Following the study of the evolution of the urban system in the early 1900s in the UK he considers the conurbation as "a large area made up of several different sized cities, which through population growth and territorial expansion were united to form an continuous urban and industrial area".

In the UK the conurbation concept was developed by the "Interagency Committee for Social Environment and Economic Development" which in 1931 proposed the following definition for the conurbation: "a continuous constructed urban area, occupied by a continuous series of buildings, factories, urban parks and playgrounds and other construction which is separated by typical rural land"[1]. Soon this area received the name "Brick and Mortar", due to the strong visual effect that it had in contrast to nearby rural areas dominated by agricultural crops and scattered buildings.

The definition of conurbation from 1931 was completed by the Census Bureau in the UK in 1951 as follows: *"the conurbation is based on local government units, taking into account population density. A village can be considered for inclusion in a conurbation if attached powerful to one of the conurbation centers for employment, shopping, higher education, sports or entertainment."*

In Romania the conurbations issue was less debated due to the particularities of the urban system, Gustav Gusti (1974, page 114)[2] refers to *"teritorial systems that can be formed between adjacent subsystems or between subsystems that have a relatively complex profile, either between the same profile and functions of specialised subsystems"*. Without too many details he gives as example the Galaţi-Braila and Deva-Hunedoara systems as complex systems with a high potential for cooperation.

To summarize the contents of definitions and theories presented above we find the same common ideas, which supports the development of an acceptable and "covering" definition for the concept of conurbation. Thus we define the conurbation as *"an expended urban area, polycentric, in territorial contiguous between whose components appear close working relationships in order to solve*

[1] G. W. S. Robinson, *British Conurbations in 1951,* *** articol scanat, localizat în baza de date J Store
[2] Gusti, G. (1974), *Forme noi de aşezare. Studiu prospectiv de sistematizare macroteritorială*, Editura Tehnică, Bucureşti

some needs of common interest resulting from their differentiated evolution and spatial distribution of functions, respectively endowments with central role. "

In this territorial gear unit dominated by centripetal forces there can also be included rural settlements in between the major urban centers, which contribute differently to the support of the whole structure, as an integral part of it.

The interposed rural settlements develop under the pressure of the two major urban centers, having besides the accommodation function (bedroom-villages) and that of agricultural and environmental hinterland. Another peremptory function is that of buffer space, a real backup in the development of the conurbation.

In developing a conurbation the national specificity acts with decisive force (as in our example). In Romania were in national network of settlements the most important urban center has less than two million inhabitants and the majority of tier 2 settlements have less than 100,000 inhabitants is impossible to define millionaire conurbations such as in UK, France, Germany and other countries with extremely high demographic potential. Undoubtedly the demographic factor in determining conurbations is extremely important but must be scaled to the specific of Romania's geographical space. In the circumstances we believe that the definition of a conurbation of 200,000 inhabitants is a natural thing in the current national context.

The genesis and evolution of a conurbation is a lengthy process, Bejeau-Garnier believes that: *"the cities get to form a conurbation during their development. In the first stage, two cities can have relationships but are too distant to form a conurbation. The development of modern transport makes it possible to bring them togheder "*and*"by their development, they tend to merge into one whole city"*.

Deva - Hunedoara conurbation - general data and current state of development

Deva - Hunedoara conurbation is a bipolar structure located in central - western Romania. At county level the conurbation is located at the confluence of the Mures with the river Cerna, at the contact the four major geographical units: Apuseni Mountains to the north with the subdivision Metaliferi Mountains, in the west the Poiana Rusca Mountains, in the south the Haţegului Depression and in the east the hills of Orăştie.

Deva - Hunedoara conurbation is located at the intersection of two major lines of the national territory thus, from east to west we have a significant flow of matter, energy and information in the form Mureş corridor over which is superimposed the 4th Pan-European transport corridor and from north to south one regional flow linking the north and south of the country from Oradea to Drobeta Turnu - Severin.

The conurbation location at the intersection of these two major streams and remoteness from the main provincial centers (Timişoara and Cluj - Napoca at 160 km) provides an opportunity to

develop as a center of balance located at the boundary between the historic provinces Banat and Transylvania.

At present the relations between Deva and Hunedoara are in full development by common modernization of transport infrastructure, drinking water, designing of new waste center and supporting industry development. So all that being said the Deva - Hunedoara conurbation is at the end of the intermediate phase of development.

Table 1. General statistical data of Deva - Hunedoara conurbation

Name	Number of settlements in the administrative area	Population in 2002	Surface in 2002(km^2)	General density (people/ km^2)
Municipiul Deva	5	69257	61,85	1119,75
Municipiul Hunedoara	6	71257	104,05	684,83
Total Deva – Hunedoara	11	140514	165,9	846,98
Orașul Simeria	7	13895	48,59	285,96
Orașul Călan	13	13030	93,54	139,22
Comuna Băcia	4	1797	29,04	61,88
Comuna Peștișu Mic	9	1290	49,95	25,82
Comuna Cârjiți	5	798	45,82	17,41
Total conurbație	49	171324	432,84	395,81

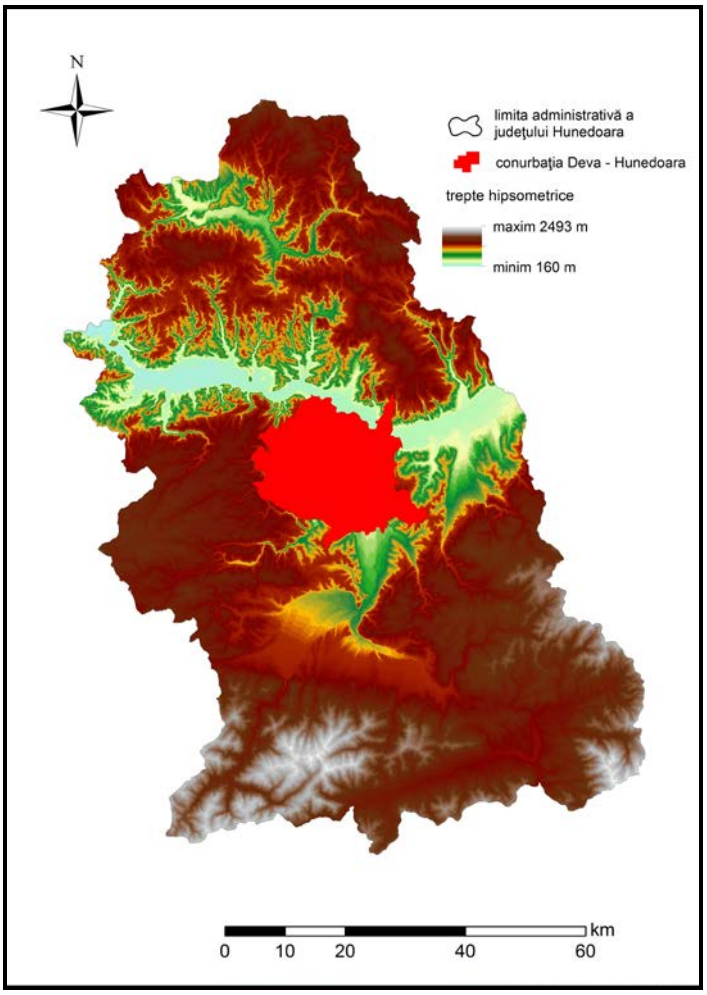

Fig. 1. Conurbation positioning at Hunedoara County level

2. Physical - geographical support

Geological substrate - support for the conurbation development

The complexity of the geological substrate on which the Deva-Hunedoara conurbation develops is given by the interaction between the Getic domain, the Danubian domain and the magmatism, interaction that led to the formation of unique geological structures in the area.

Morphology

Largely the territory occupied by the Deva - Hunedoara conurbation coincides with the western intramontane Mureş corridor, the Sebeş-Deva sector and the Strei-Cerna depression. In this context, the morphology becomes one of the main factors that determine the limitations in the edification of the conurbation. The conurbation framing by mountain ranges and the of limiting inputs and outputs throw meadow areas emphasizes the interdependability of settlements whitin the conurbation

Geomorphology and specific geomorphological processes

The geomorphologic processes within the Deva - Hunedoara conurbation, by their small scale, are not able to determine the constraints in the subsequent development of the conurbation. Compared with the geomorphological processes, the overall relief, by his complexity, given by the presence of lowland units, hilly and mountainous units, was the one who caused the current configuration of the the settlements, the distribution lines of communication, etc.

Altitudinal distribution of relief

Altitudinal distribution of relief is an important factor, being the basis of the analysis of spatial distribution of settlements. Identification of relief scales and their classification in altitudinal classes was a meticulous process due to the big morphostructural differences present across the conurbation.

In the Deva-Hunedoara conurbation floodplain landscape, framed by the altitude of 240 meters occupies a generous 13445 hectares (31.06%), hilly terrain framed in between 241 and 600 meters occupies 28883 hectares (66.74 %) and mountain landscape, falling over 600 m altitude occupies small areas, 956 hectares (2.20%).

The hydrographical network

The hydrographical network in the conurbation is totally dependent on the Mureş River wich through its catchment (3 rd rank basin) drains the entire area, representing a total of 432 km^2.

Soils

In the conurbation soils are very diverse due to the interaction of geological substrate, hydrographical network, vegetation and not least anthropogenic factor. On the conurbation's territory we encounter, due to complex genetic factors, four major classes of soils: floodsoil, luvisols, cambisols and cernicsolis, each having a specific spatial distribution and multiple use possibilities.

3. Land Use

The use of land as a result of geosystems interaction of a geographical area, is the most appropriate and convenient parameter used to assess, in terms of geography, the potential for development of a territory.

Territorial distribution of different forms of land use emphasizes or inhibits socio-economic development based on the need for resources in a favorable frame.

In the conurbation land use is dictated by the characteristics and evolution of the seven administrative units that compose it.

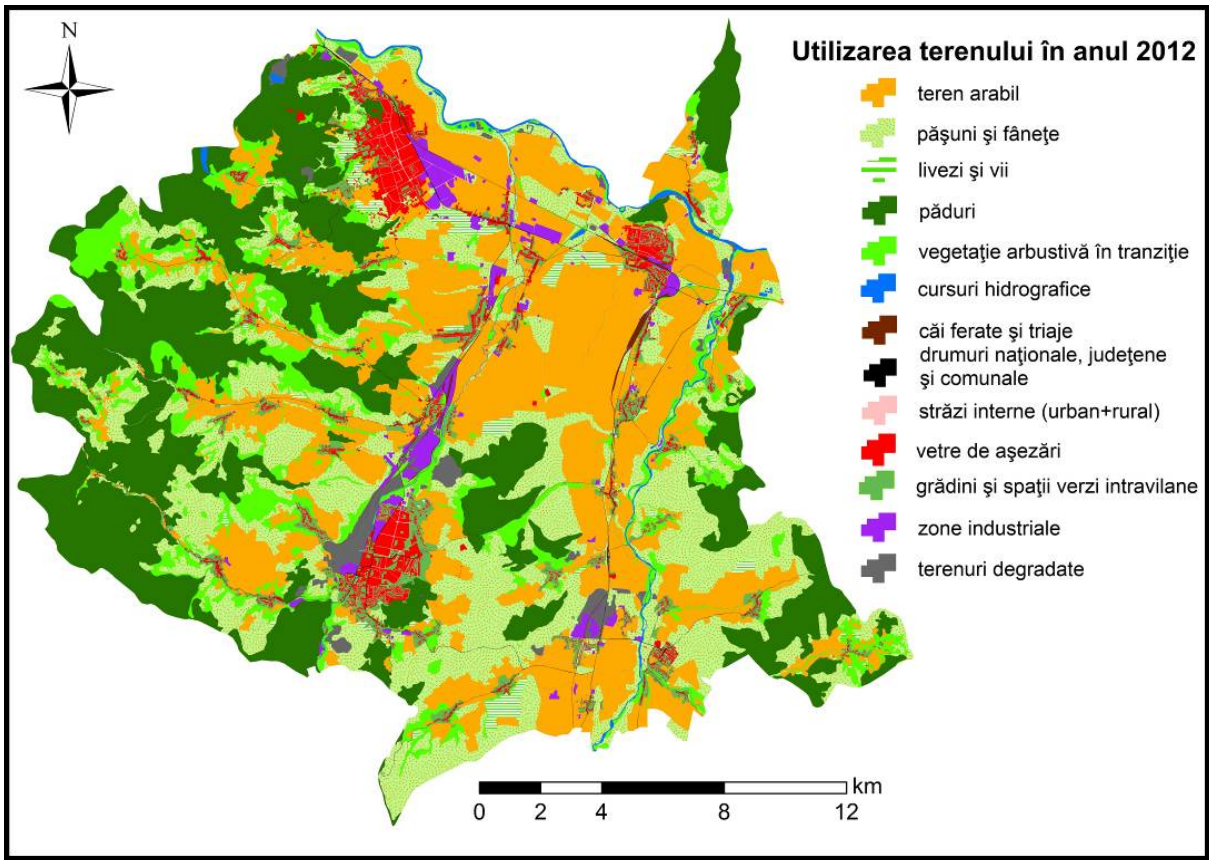

Fig. 2. Land Use in 2012

Changes in land use in the conurbation

The change of land use is based on three basic needs of human society: the need for food, the need for natural resources and the need for shelter. Satisfying these three basic needs meant the constant change of the environment.

Quantifying how the use of land in a certain area has changed over time is a difficult process. The difficulty lies in the emphasis of change at the micro level due to the lack of precise information (cartographic or otherwise).

Evolution of land use in the conurbation surprises the defining elements of the conurbation's evolution: development of industry, the development of communication lines and the spatial development of centers towards one another. These three items "weld" all parts of the conurbation in precisely along the lines of force creating a unitary structure whose evolution is now irreversible. All the secondary elements represented by farmland and woodland represent secondary elements which throughout the evolution of the conurbation declined steadily to facilitate the development of the structure.

Table 2. Evolution of land use in the conurbation in the period 1773 - 2012

Nr. Crt.	Mod de folosire a terenului	Total conurbație - anul 1773		Total conurbație - anul 1924		Total conurbație - anul 1976		Total conurbație - anul 2012	
		suprafața (ha)	pondere (%)	suprafața (ha)	pondere (%)	suprafața (ha)	pondere (%)	suprafața (ha)	pondere (%)
1.	***Suprafață totală***	**43284**	**100**	**43284**	**100**	**43284**	**100**	**43284**	**100**
2.	***Folosință agricolă***:	**27101,60**	**62,61**	**26065,20**	**60,25**	**23589,74**	**54,50**	**22840,67**	**52,77**
3.	***Suprafață totală împădurită***	**15231**	**35,18**	**14778,70**	**34,14**	**14860,10**	**34,33**	**14916,54**	**34,46**
4.	***Cursuri hidrografice***	**323,30**	**0,75**	**352**	**0,81**	**362,04**	**0,83**	**362,04**	**0,85**
5.	***Suprafețe anexe căilor de comunicații***	**161,20**	**0,38**	**323,60**	**0,74**	**481,12**	**1,12**	**499,97**	**1,15**
6.	***Vetre de așezări umane***	**466,90**	**1,08**	**1544,30**	**3,56**	**2749,90**	**6,35**	**3246,75**	**7,50**
7.	***Suprafețe ocupate de zone industriale***	-	-	**133,60**	**0,30**	**940,10**	**2,18**	**768,99**	**1,77**
8.	***Terenuri degradate***	-	-	**86,60**	**0,20**	**301,00**	**0,69**	**650,04**	**1,51**

4. Population Dynamics

The study population dynamics in Deva - Hunedoara conurbation during the period 1850 - 2011 reveals with no doubt a growing number of inhabitants in the over 150 years studied. Population dynamics in the conurbation, as otherwise in Romania, had several periods of development (fig. 3):

- during 1850 - 1910 the population increased steadily from 22248 inhabitants in 1850 to 40472 inhabitants in 1910 fueled by positive demographic growth;

- during 1910 - 1930 the population had to endure the period of war and economic instability, it is noticed more by stagnation thus the population increases from 40472 to 40761 inhabitants;
- the period 1930-1992 is characterized by a booming population increase as a result of economic and demographic policies generally imposed by the communist regime, the population increased from 40 761 inhabitants in 1930 to 192958 inhabitants in 1992;
- the period 1992 - 2002 can be considered as the beginning of a negative demographic trend. Population decreased from 192958 inhabitants in 1992 to 171324 inhabitants in 2002;
- the period 2002 - 2012 is a period of negative demographic evolution, the population decreased from 171324 to 138091 inhabitants, the main reductions were in urban areas.

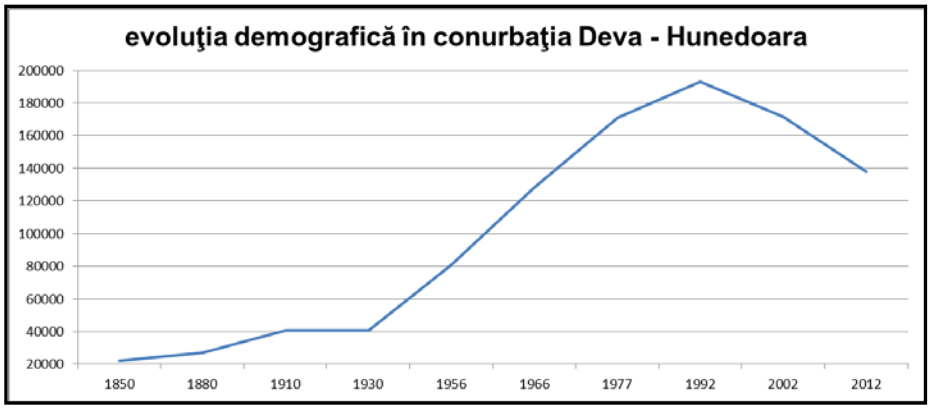

Fig. 3. Demographic evolution between 1850 and 2012

Table 3. General density of population between 1850 and 2002

Densitatea generala / Unitatea administrativă	recensământ an 1850	recensământ an 1910	recensământ an 1966	recensământ an 1992	recensământ an 2002	recensământ an 2011
Municipiul Deva	55,23	166,27	479,98	1268,19	1119,75	915,87
Municipiul Hunedoara	53,27	82,88	663,95	781,71	684,83	532,28
Orașul Simeria	50,03	156,53	230,72	294,52	285,96	244,78
Orașul Călan	58,61	77,47	136,28	157,55	139,22	112,68
Comuna Băcia	56,37	70,69	74,96	67,76	61,88	61,43
Comuna Peștișu Mic	47,22	50,23	38,41	26,04	25,82	23,52
Comuna Cârjiți	30,44	47,01	29,65	18,87	17,41	14,53
Total conurbație	51,40	93,50	296,15	445,79	395,81	319,03

The population's occupational structure in the conurbation clearly differentiates between urban and rural areas. In rural areas, the largest share is held by the working population employed in primary and secondary sectors. The high share of the secondary sector is the result of commuting from the population employed in the adjacent urban industry. In the urban area the occupational structure of the working population is diversified depending on the importance of the settlement. There is clear differentiation between the 4 urban centers, differences due to their historical evolution.

In the primary sector there were employed 2478 people, representing 3.14% of active population. In the secondary sector there were employed 30398 people, representing 38.66% of the active population. In the tertiary or services sector they were engaged 36124 people representing 45.79% of the active population. The tertiary sector is the most dynamic, being steadily increasing with the change of political regime in 1989. The share of unemployed is 12.41% with major differences between urban and rural areas.

5. Territorial evolution of settlements

The administrative organization

The administrative organization is the most comprehensive form of landscaping, being the main determinant of relations between settlements but also positioning of the structures with central role. The administrative organization is dynamic, being influenced by the socio-political and historical events.

The evolution of the studied territory highlights the administrative centralization tend to reduce the number of administrative units. It highlights the evolution of the strong urban centers Deva, Hunedoara, Simeria and Calan. It is also observed the stability in the organization of Cîrjiţi and Băcia communes whose surface and composition changed very little from 1876. We also notice that most of the fleeting administrative centers from different periods of the evolution have a negative socio-economic development with the loss of the administrative role.

Urban settlements

The evolution of urban settlements within the conurbation is based on the development of construction in the most favorable areas available. Thus starting from 1773 there is a tendency for development on land located in floodplains or main river terraces. With the development of industry and of communication lines there is a clear trend of development along them. Deva and Hunedoara have benefited greatly from this development of the communication routes allowing them to come closer and develop cooperative relations.

Regarding the quantification of territorial development of the urban centers is evident that the greatest development have had Deva and Hunedoara, benefiting from the existence of core cities since the Middle Ages. Călan and Simeria cities, in their posture emerging urban centers, have grown very well during the communist industrialization, but will have to rethink their development strategy within the conurbation taking complementary functions from Deva and Hunedoara.

Rural settlements

The substantial presence in the Deva - Hunedoara conurbation of rural settlements is a consequence of the development in a dynamic and highly competitive space. Since it is imperative that each involved settlement contributes to the development of the conurbation with naturally available resources we considered necessary to study the territorial evolution of all the 45 rural settlements from the the conurbation.

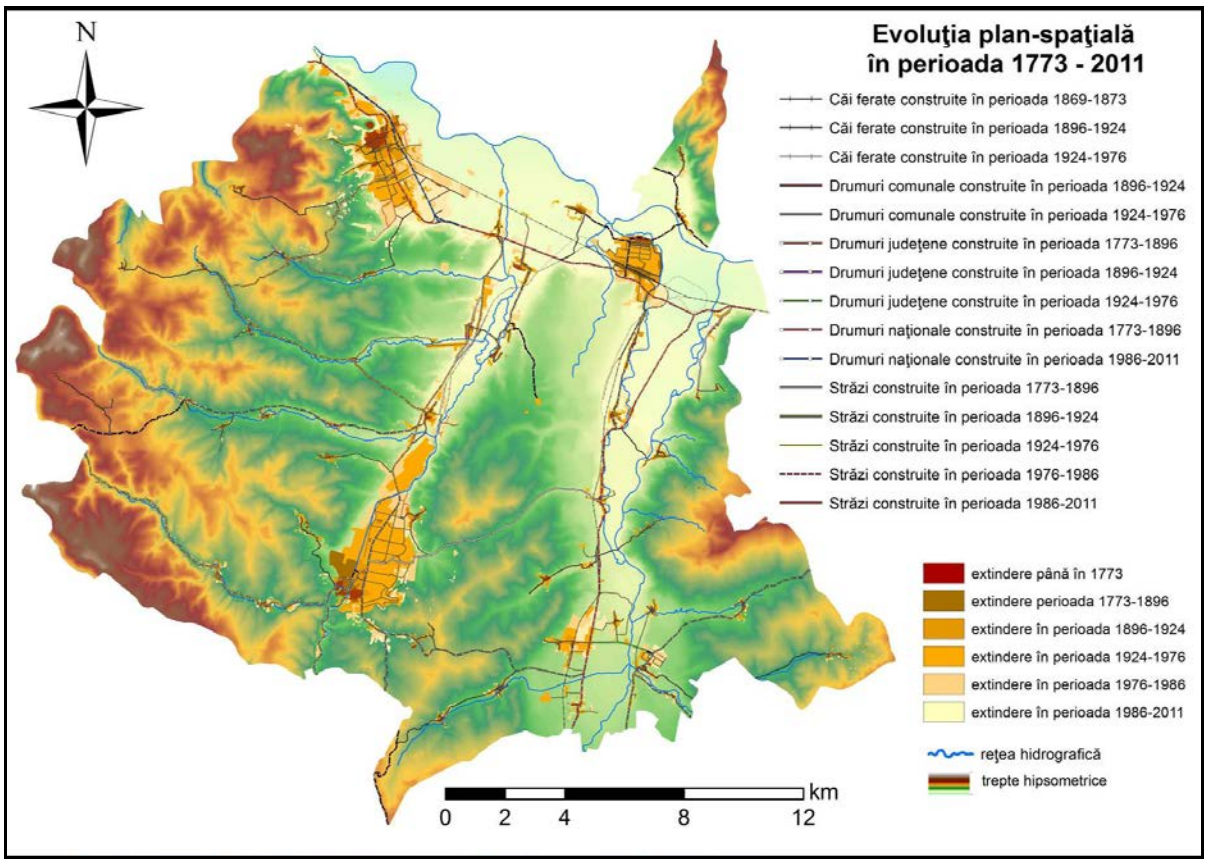

Fig. 4. The spatial evolution of Deva - Hunedoara conurbation

The socio-economic and territorial development of settlements in the conurbation during the period 1773-2013 is due to the collaboration between several socio-economic and political factors.

Chronologically the first factor that influenced some settlements was a political factor, the strengthening and expansion of Hasburgic imperial influence in Transylvania which indirectly led to the consolidation of administrative role of Deva and economic role of Hunedoara. The next factor in the evolution of settlements is economic, namely the exploitation of iron in the Poiana Rusca Mountains, it becomes crucial for the evolution of Calan and Hunedoara. Another factor in the evolution of settlements is the construction of the Arad - Alba Iulia railroad and the construction of the

Simeria - Petrosani respectively Simeria - Hunedoara ramifications but also the modernization of roads. This factor has strengthened the administrative power of Deva and established Simeria.

A very important social factor for the subsequent development of settlements in the conurbation refers to the colonization of Hungarian and German populations.

The Union of Transylvania with Romania in 1918 can be considered the socio - political factor that laid the groundwork for further economic development of the area by taking the production capacity from the Hungarian power and upgrading them. Political takeover by communist forces is a complex political factor with major implications in terms of economic development, systematization, spatial expansion of settlements and population growth. Political regime change in 1989 is the last factor with major implications in the evolution of settlements within the conurbation.

Table 4. Synthetic table with surface evolution in administrative areas within the conurbation

unitate administrativă	1773	1896	1924	1976	1986	2011
Deva	51,67 ha	95,51 ha	210,35 ha	550,89 ha	858,37 ha	1139,01 ha
procent din extindere maximă	4,53%	8,38%	18,46%	48,36%	75,36%	100%
Hunedoara	34,38 ha	129,16 ha	228,04 ha	856,37 ha	1161,15 ha	1239,84 ha
procent din extindere maximă	2,77%	10,41%	18,39%	69,07%	93,65%	100%
Simeria	21,53 ha	86,41 ha	158,51 ha	336,20 ha	426,86 ha	501,88 ha
procent din extindere maximă	4,28%	17,21%	31,58%	66,98%	85,05%	100%
Călan	19,64 ha	45,99 ha	101,75 ha	276,10 ha	398,54 ha	479,52 ha
procent din extindere maximă	4,09%	9,59%	21,21%	57,57%	83,11%	100%
Băcia	6,76 ha	18,71 ha	42,41 ha	74,32 ha	101,85 ha	120,29 ha
procent din extindere maximă	5,61%	15,55%	32,25%	61,78%	84,67%	100%
Cârjiți	6,06 ha	11,09 ha	41,90 ha	49,46 ha	54,60 ha	61,80 ha
procent din extindere maximă	9,80%	17,94%	67,79	80,03%	88,34%	100%
Peștișu Mic	6,50 ha	15,23 ha	39,58 ha	52,16 ha	68,79 ha	72,74 ha
procent din extindere maximă	8,93%	20,93%	54,41%	71,70%	94,56%	100%
total conurbație	146,54 ha	402,10 ha	822,54 ha	2195,50 ha	3070,16 ha	3615,08 ha
procent din extindere maximă	4,05%	11,12%	22,75%	60,73%	84,92%	100%

New areas of territorial expansion in the conurbation

Future territorial evolution of Deva - Hunedoara conurbation will depend on the ability of local authorities to create and implement projects in a wide range of fields, projects ensuring socio - economic stability, development of the area and at the same time, creating the base for development of new urban areas in the settlements of the conurbation.

The main areas of development areas are located (as before) along the main communication routes, forming and developing the existing areas. The three main development directions are clustered along the Deva - Simeria, Deva - Hunedoara and Simeria - Calan roads. In a similar measure, but at a smaller scale the conurbation will extend along the secondary axes corresponding to streams, county or municipal roads where smaller surfaces are available.

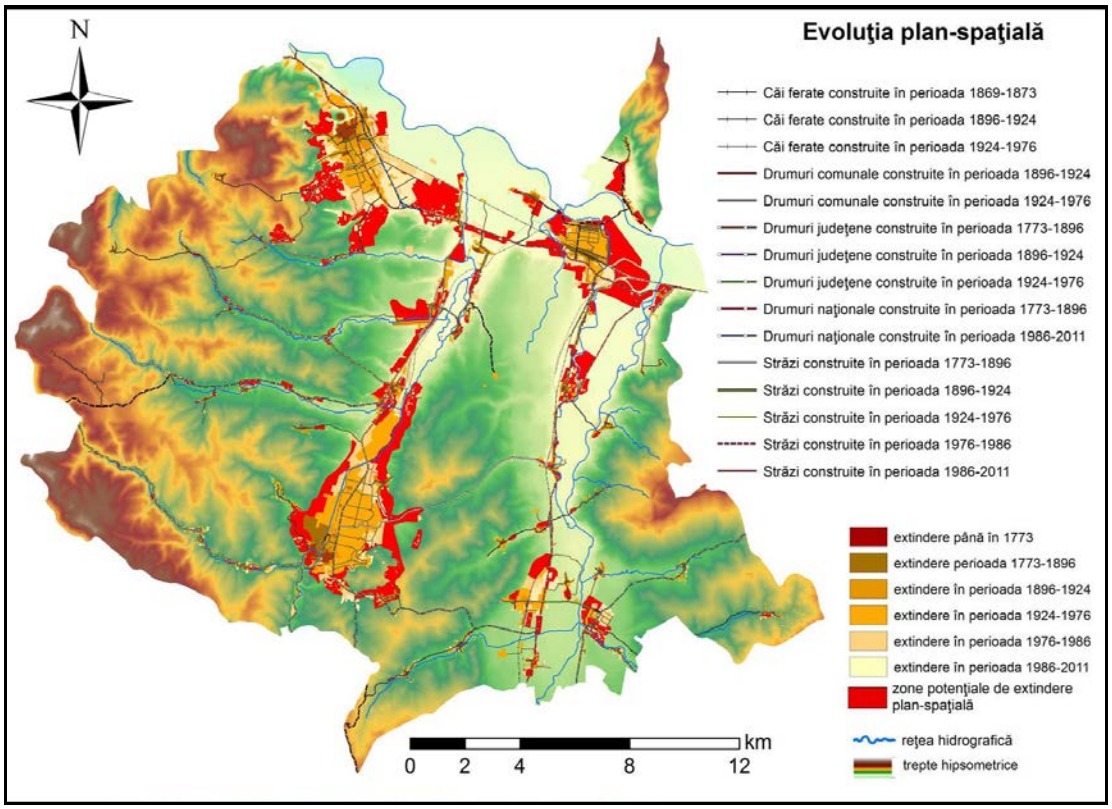

Fig. 5. Deva - Hunedoara conurbation - potential areas of spatial development

6. Communication routes within the conurbation

Railroad structure

All railway lines crossing the conurbation are part of the main transport hub M200 Arad - Braşov which has a total length of 450 km. From this hub detach the secondary mainline M202 Simeria - Filiaşi (211 km) and the secondary line M207 Simeria - Hunedoara (15.4 km).

The structure of the road network

According to the current classification in Romania, highlighted by V. Surd, there are four major categories of roads: motorways, highways, county roads and local roads. Table 5 shows a schematic situation of the road network from the conurbation.

Table 5. Quantitative indicators of the road network in the conurbation

	Drum Comunal	Drum Judeţean	Drum Naţional		Autostrăzi	Total
			Expres	European		
Lungime Totală (km/%)	49,8(23,91%)	106,55(52,38%)	9,5(4,64%)	33,9(16,57%)	5,1(2,5%)	204,5(100%)
Densitate Reţea Rutieră (km/ 1000 km^2)	115,2	246,64	21,99	78,47	11,80	473,37

Proposals to improve the road network

In the context of the future development of the conurbation, road links between different areas are of utmost importance, causing the territorial development of settlements. The following additional measures are necessary for the harmonious development of the road system: belt road for Hunedoara (in the west), extension of DJ 700 Sântandrei - Pestisu Mare - Hunedoara, the modernization of communal road Hunedoara - Batiz, construction of a municipal road in the direction of Simeria Veche - Totia - Petreni - Călan; construction of a roundabout at the intersection of E68 with E68B in Sântuhalm; dismantling the railway level crossing at the intersection of M207 and E68; creating pedestrian walkways over roads in rural areas with high traffic.

Road traffic in urban areas

The urban road network consists of all streets in a city, streets that provide two types of movement, internal, which includes all types of travel of residents to/from work, travel for supplies and other occasional trips and external or penetration includes movement to and from the city.

The main malfunctions identified in Deva refer to excessive use of the intersection in "T", congestion in the commercial area in the east and the malfunction of DN7 as ring road, the rectangular neighborhoods and not least the lack of places parking in neighborhoods.

The biggest malfunctions identified in the Hunedoara is the lack of a belt road that takes traffic north - south, inadequate link between main traffic and the district magistrate and not least the lack of parking spaces in neighborhoods.

The main malfunctions identified in Simeria refers to heavy traffic on the E68 and the lack of additional links between the north and south side of the city.

Major traffic malfunctions in the city of Călan refers to the isolation between the two parts of the city as well as the weak links with Crişeni neighborhood.

Model of public transportation in the conurbation

Mobility of people and goods is one of the conditions for the existence and development of conurbations, providing transport between cities is a necessary condition for urban development.

Based on current data that refers to public transport in Deva and Hunedoara but also considering that mobility is an imperative condition of conurbation operation and that the creation of an integrated system is a priority for the development of the conurbation, we propose the following structure of the public transport system:

- the red zone corresponding to local transport in the urban centers Deva, Hunedoara, Călan and Simeria, transport with buses only;

- the blue area: integrating road and rail connection to the main traffic flows efficiently located along lines of force;
- the yellow zone: serviced by minibuses will ensure optimum connection of rural areas to urban centers along the secondary flows of traffic.

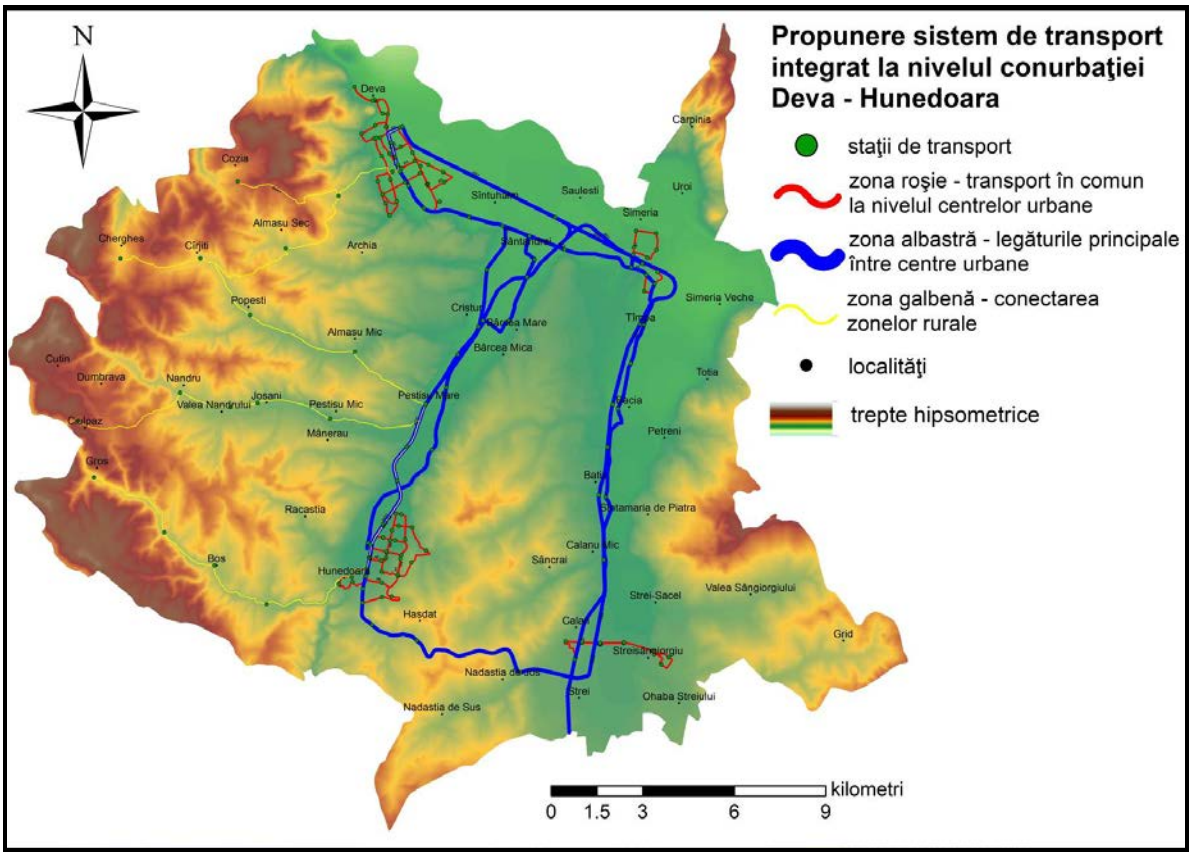

Fig. 6. Integrated public transportation system in Deva - Hunedoara conurbation

7. The settlements system

Deva - Hunedoara conurbation is one of the most densely populated areas in Romania with a total of 49 settlements, organized into seven administrative units, four urban and three rural, stretched over an area of 432.84 km^2 with over 170,000 people living in it. The large number of settlements impose their hierarchy order to create an accurate picture of the organization and functioning of the conurbation. Creating the system of settlements in the conurbation imposes the underscore of the distribution of settlements, the identification of central role structures and study of the zones of influence.

Settlement distribution

The spatial distribution of settlements in the conurbation is the result of intensive co-working between morphological and hydrographic factors. It is obvious, however, the role played by the human factor in the localization of settlements according to the need for protection and optimal exploitation of natural resources. Table 6 presents a summary situation regarding the distribution and density of settlements in the conurbation

Table 6. Distribution indicators of settlements in Deva - Hunedoara conurbation

Unitatea Administrativă	Suprafaţa (km^2)	Număr Localităţi	Densitatea (localităţi/100 km^2)	indicele de arealitate (km^2/ localitate)
Deva	61,85	5	8,08	12,37
Hunedoara	104,05	6	5,76	17,34
Călan	93,54	13	13,89	7,19
Simeria	48,59	7	14,40	6,94
Băcia	29,04	4	13,77	7,26
Cârjiţi	45,82	5	10,91	9,16
Peştişu Mic	49,95	9	18,01	5,55
Total conurbaţie	432,84	49	11,3	8,83

Settlement clasification

Knowing the settlement classification is an important step in building a viable settlement system in the conurbation. The classification should take into account the two distinct criteria, demographic criterion and the criterion of territorial size of the settlement.

Demographic size

At the 2002 census the conurbation was comprised of a total of 49 settlements, four had city status, and 45 were rural, villages or village centers (Table 7).

Table 7. Demographic size

Tip Localitate		Număr	Nume
Oraşe mijloci		2	Deva, Hunedoara
Oraşe mici		1	Simeria
Oraşe foarte mici		1	Călan
Sate mijloci	mici	7	Sântuhalm , Răcăştia, Sântandrei, Streisângeorgiu , Batiz, Băcia, Tâmpa
	mari	3	Cristur, Bârcea Mică, Peştişu Mare
Sate mici		29	Hăşdat, Boş, Bârcea Mare, Săuleşti, Simeria Veche , Uroi, Cărpiniş, Călanu Mic, Strei-Săcel, Sântămăria de Piatră, Sâncrai, Valea Sîngeorgiului, Grid, Ohaba Streiului, Strei, Nădăştia de Sus, Nădăştia de Jos, Totia, Petreni, Peştişu Mic, Nandru, Mânerău, Valea Nandrului, Josani, Cârjiţi, Popeşti, Chergeş, Cozia, Almaşu Sec
Sate foarte mici		6	Ciulpăz, Cutin, Dumbrava, Groş, Archia, Almaşu Mic

Constructed surface sizing

The surface of settlements, rural or urban, is an important indicator of the potential territorial development. Between built area, population size and positioning of settlements there are often intimate relationships, difficult to quantify, but which work like this: a settlement with a big built area, with large population is likely to be positioned favorably in the territory and the same is true for weak settlements, with small populations that are usually located unfavorable territory (table 8).

Table 8. Classification depending on the surface of settlements: general table and administrative unit distribution

Tip Localitate	Număr	Nume
Foarte Mari	2	Deva, Hunedoara
Mari	2	Simeria, Călan
Mijlocii	5	Sântuhalm, Cristur, Peştişu Mare, Sântandrei şi Băcia
Mici	30	Archia, Bârcea Mică, Răcăştia, Hăşdat, Boş, Bârcea Mare, Cărpiniş, Săuleşti, Simeria Veche, Uroi, Streisîngeorgiu, Batiz, Călanu Mic, Grid, Nădăştia de Jos, Nădăştia de Sus, Sâncrai, Sântămăria de Piatră, Strei, Strei-Săcel, Valea Sînge orgiului, Petreni, Tâmpa, Almaşul Sec, Cozia, Popeşti, Peştişu Mic, Josani, Mânerău, Nandru
Foarte Mici	10	Groş, Ohaba Streiului, Totia, Cârjiţi, Chergeş, Almaşu Mic, Ciulpăz, Cutin, Dumbrava, Valea Nandrului

Unit. Administrativă	Localităţi Foarte Mici	Localităţi Mici	Localităţi Mijlocii	Localităţi Mari	Localităţi Foarte Mari
Deva	-	2	2	-	1
Hunedoara	1	3	1	-	1
Călan	1	11	-	1	-
Simeria	-	5	1	1	-
Băcia	1	2	1	-	-
Cârjiţi	2	3	-	-	-
Peştişu Mic	5	4	-	-	-
Total	10	30	5	2	2

Endowment with central role structures

Central role structures represent important points in the life of human communities, rural and urban, influencing the people's actions and building settlements role within the system.

Central role structures are a direct consequence of the individual needs of a particular geographic area. Distribution and classification of central role structures is given by the frequency with which a given endowment of a settlement is required by the individual. Thus after the frequency with which the central role is used, facilities can be classified as:

- facilities for daily use: public utilities, food supply, etc..;
- commonly used facilities: education, medical, social, religious, transport and communications, etc.;
- occasional facilities: travel, administrative and fiscal, etc..

Public utilities

Providing utilities represents a major issue for any settlement or settlement system. The absence or deficiencies recorded in providing one or more public utilities creates serious problems in the development of settlements. The public utilities considered of extreme importance to a city are electric power, water, sewerage, heating, gas and garbage collection.

Electricity distribution network. In the conurbation the percentage of electricity network connection is over 99%, with very few isolated areas or temporary settlements not being connected.

Water distribution network. Given that water is essential for human life it is known the concern for network construction, capture and distribution.

Currently all four urban areas receive water supply, but of the 45 rural settlements there are 16 with no current drinking water: Archia, Răcăştia, Hăşdat Boş, Groş, Grid, Totia, Almaşu Sec, Cozia, Cârjiţi, Chergeş, Popeşti, Almaşu Mic, Dumbrava, Cutin şi Ciulpăz.

The sewage system is constructed in parallel with the current water supply services but faces a number of particular problems. By far the greatest problem relates to undersize of the network from the point of view of the collection and from the point of view of the wastewater treatment. Water treatment is done in 6 stations in the conurbation: Deva, Hunedoara - Buituri, Sântuhalm, Bârcea Mare, Călan şi Simeria. Of these four stations are mixed residential-industrial (Hunedoara - Buituri, Bârcea Mare, Călan and Simeria) and none has biological stage.

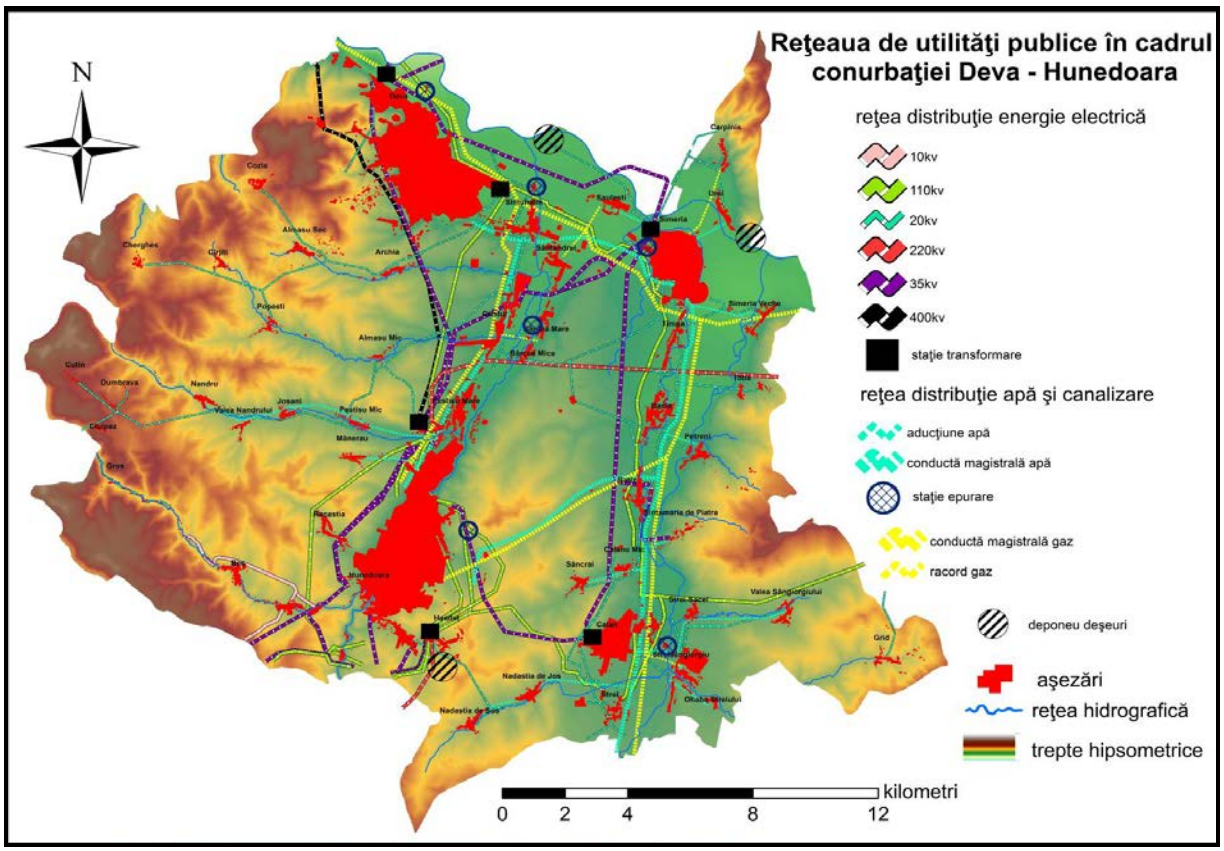

Fig. 7. Public utilities networks in the conurbation

Natural gas distribution network. Natural gas provides extra comfort to people in both urban and rural areas, the main household use for natural gas is for cooking and heating. It should be mentioned that of the 49 settlements of the conurbation only 21 have a gas supply system.

Waste disposal in the conurbation is the responsibility of local authorities who must provide the infrastructure for the collection, recycling and waste deposition. The only settlements where no collection is introduced are Cutin, Ciulpăz, Dumbrava, Groş, Totia and Grid due to the large distance to other settlements and because low number of inhabitants.

District heating services is present exclusively in urban areas with varied share in the 4 urban settlements as follows: in Deva 91.11% of housing can have access to the central district heating, in the city of Hunedoara 59.49% of the housing have access, in Simeria 43.08% and in the city of Călan 38.06% of housing should have access to heating.

Administrative facilities

Territorial organization in rural or urban administrative units creates some of the most important central role structures of the territory. Endowment with administrative structures represents a fillip to a settlement, one of the main drivers of socio-economic development. In terms of administrative organization the most favored settlements are those that are declared village centers in rural areas respectively urban cities or towns.

Under current administrative-territorial division Deva-Hunedoara conurbation consists of four urban administrative units (two municipalities and two cities) and 3 commons, each with its own mayor and local council.

Commercial polarization

Commercial facilities are classified according to the goods they sell goods that determine the frequency with which they are used. It is obvious that the highest frequency is that of the stores that sell food, which are required daily when those stores that sell durable products or specialized products are frequented much rarely. However they represent big potential endowments for the polarization of the space, attracting customers from remote areas.

Table 9. Distribution of commercial structures in the conurbation

localitate	Centru comercial	Metro	Praktiker	Hipermarket	Supermarket	Minimarket	Piaţă	Instituţii bancare
Deva	1	1	1	2	7	13	3	13
Hunedoara	1			1	6	11	3	8
Simeria					2	4	1	3
Călan					2	3	1	2
Săntuhalm						1		
Cristur						1		
Sântandrei						1		
Peştişu Mare						1		
Băcia						1	1	
Batiz						1		
Tâmpa						1		

Educational establishments

Educational establishments are central features essential to the functioning of human society, contributing significantly to the central role of settlements in which they are located (fig. 8).

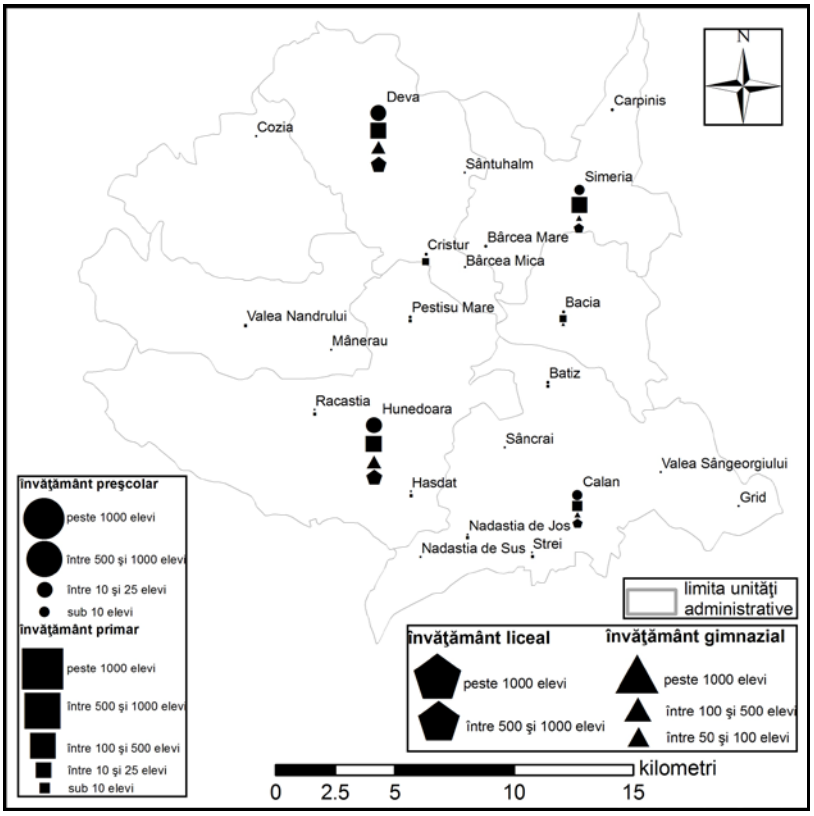

Fig. 8. Distribution of educational structures in the conurbation

Educational establishments, like other central place structures can be classified into tiers. Based on the level of education they offer, they are organized in a pyramidal system, on the base are nurseries and kindergartens and on the top universities. Spatial distribution of schools significantly contributes to the polarizing role of a settlement. Educational establishments can be classified as: pre-school (nursery, kindergarten), primary (grades I-IV), general (grdesI-VIII), highschool and vocational education (school groups, schools of arts and crafts, highschools, national colleges) and universitary (universities, university extensions and continuous training centers).

The structure of health services

The health system has a good hierarchy including family physicians, medical specialists, pharmacists, ambulatory clinics and hospitals. For the organization medical structures and medical personnel needed in the conurbation the Hunedoara County Insurance House and the Medical College are in charge with funds allocated directly from the Ministry of Health, County Council and Local Councils. Table 10 shows the current situation in the conurbation.

Table 10. Healthcare services in the conurbation

	medici de familie	medici de specialitate	farmaci	serviciu ambulanţă	spitale
Deva	36	101	17	2	1
Hunedoara	39	35	16	1	1
Simeria	10	3	5	1	1
Călan	5	3	4	1	

Services and related structures of the transport system

In the exposure of routes of communication from the conurbation in Chapter 6 there were not been described in detail the related structures and transport services with the potential for central place, being made only a technical. These structures are described here.

Train stations and railway transport

The mere presence of a station or a stopping point in a settlements is a factor that stimulates the development of the settlement and makes it more attractive for its inhabitants. However differentiation between stations in terms of the number and quality of trains transiting the town is important.

Bus terminals and road transport

Bus terminals are specialized structures with boarding-disembarking platforms, waiting rooms and information desks serving local, county, national and international routes. In the conurbation there are theoretically five bus terminals in the four urban centers (two in Deva), but the bus terminal in Călan is closed and abandoned for 5-6 years.

Gas stations, vulcanizing and auto services

Gas stations, although not essentially central facilities are important structures of the community due to the constant need for movement of people and goods. *Vulcanizing and auto services* like gas stations bring more comfort for the people.

Table 11. Institutions and transport services in the conurbation

	trenuri IC/zi	trenuri IR/zi	trenuri R/zi	autogări	benzinării	vulcanizări	service auto
Deva	4	26	40	2	10	6	46
Hunedoara	-	-	10	1	5	4	17
Simeria	4	26	70	1	2	1	6
Călan	-	4	16	1	1	-	1
Săulești	-	-	33	-	-	-	-
Tâmpa	-	-	15	-	-	-	-
Peștișu Mare	-	-	10	-	1	-	1
Cristur	-	-	10	-	-	-	1

Bârcea Mică	-	-	10	-	-	-	-
Bârcea Mare	-	-	10	-	-	-	-
Sântandrei	-	-	10	-	-	-	2
Simeria Veche	-	-	14	-	-	-	-
Băcia	-	-	14	-	-	-	-
Batiz	-	-	14	-	-	-	-
Călanu Mic	-	-	14	-	-	-	-
Sântuhalm	-	-	-	-	1	-	9

Cultural - religious and relaxation facilities

Cultural - religious and relaxation facilities are a special category of facilities with a central role in the settlements often being emblematic for a settlement, conferring notoriety. This type of features is a special one because it addresses two distinct categories of people, addresses primarily to the settlement's residents and then to tourists.

Church structures

The emergence and development of different church structures is related to ancestral human need to believe in a higher spiritual power. In the Deva - Hunedoara conurbation, because of the historical evolution of the territory, the most important confessions are the Orthodox and the Catholic (Roman and Greek). In addition there are also present other confessions such as the Protestant, Reformed, Baptist, Pentecostal, etc..

Institutions and cultural facilities

The institutions and cultural structures vary qualitatively and quantitatively much in the conurbation according to community needs, allocated funds and interest for these activities. The presence of cultural and sports facillities can not be considered binding for a particular type of settlement however over time the presence of such features may be beneficial in terms of prestige of the settlement and bring a number of material benefits.

Tourist attractions and accommodation

The presence, and especially the exploitation of touristic resources of a settlement can bring it prestige and generally increase economic activity in the trade, accommodation and transport. The conurbation has tourism potential, cultural historic - heritage and great architectural value both for the area and for the entire country.

Besides the attractions, the actual accommodation infrastructure has a very important role in attracting tourists and leads to the enhancing of the prestige of a settlement. In the conurbation there are a total of 29 specialized accommodation structures.

Conclusions

Endowment with central role structures is a true picture of the actual development of a settlement but it is also a good indicator of potential development.

Undoubtedly most of the central features can be found in cities and towns of the conurbation where they are a consequence of evolution (administrative and cultural - religious), a necessity dictated by population (commercial, educational, medical and communication) and not least a constraint dictated by geographic location (public utilities). Endowment with central role come from a wide range of human needs and depending on the specific activities are distributed in the territory with different frequency.

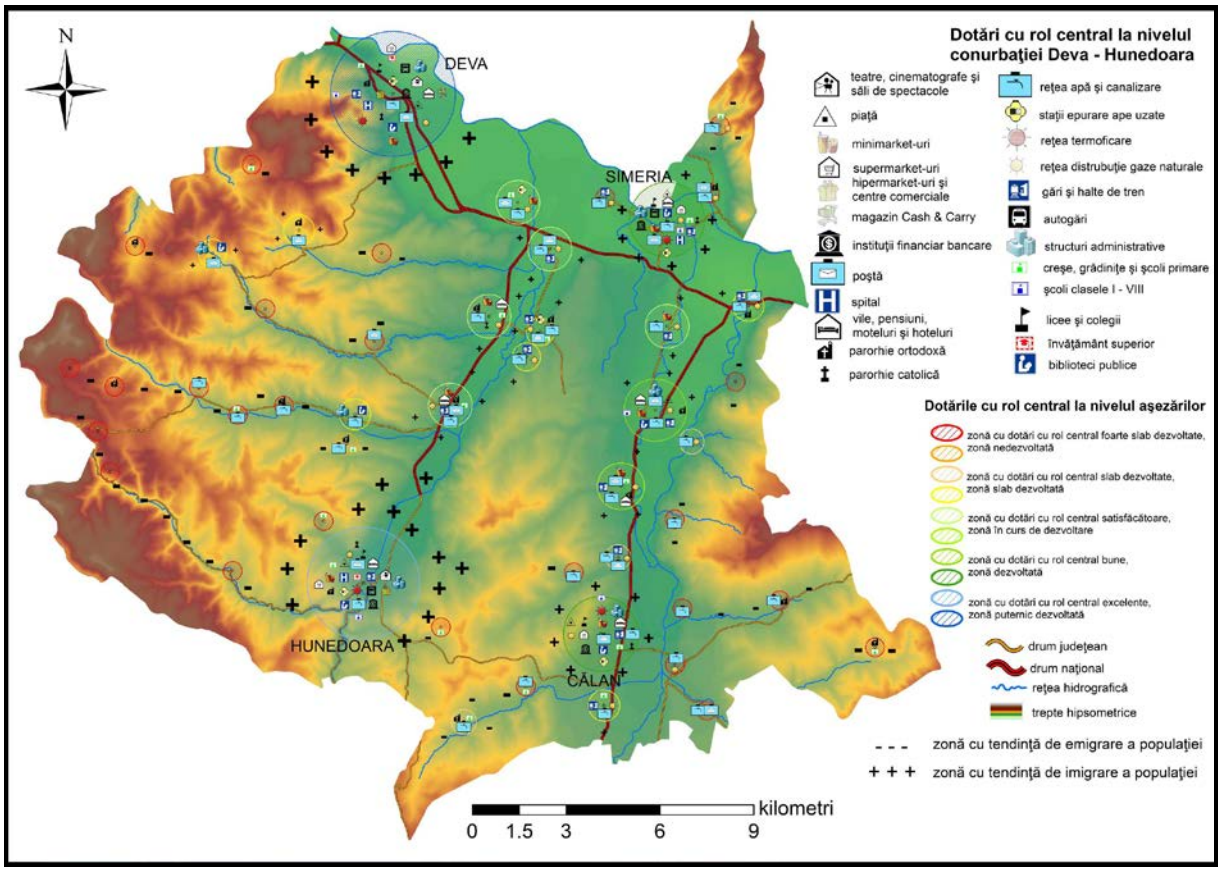

Fig. 9. Facilities with central role in the conurbation

Hierarchy of settlements in Deva - Hunedoara conurbation

As mentioned in Chapter 1 in Romania the hierarchy of settlements is based on Law 351 of July 24, 2001 - *Law on National Planning Section IV - The network of settlements*. This law establishes the hierarchy of settlements based on demographic and administrative criteria, without

taking into account the socio - economic criteria or presence of structures and facilities with central role in the towns.

How in this study a general hierarchy, such as that given by Law 351, is not analytical and sufficiently complex to decipher the operation of the conurbation, i opted for a complex hierarchical structures that takes into account the central role, demographic factors and spatial development of each settlement, based on those proposed by V. Surd (2005) and Molnar, E., Maier, A., Ciangă, N.(1975).

Undoubtedly Deva occupies t*he highest step in the hierarchy of settlements of the conurbation, the urban center of the county(J)*. The second place between the conurbation's settlements is Hunedoara with the role of *zonal coordinating center (Z)*. The third position is that of the *local coordination centers (L)* occupied by the cities Simeria and Calan. The fourth step, *supra-centers (S)* is occupied by the villages of **Băcia, Cristur** şi **Peştişu Mare.**

On the fifth stage, *communal centers (C),* we can place the village centers ***Cârjiţi*** şi ***Peştişu Mic***. The sixth tier, *undercommunal centers (Sc)* is occupied by villages which despite having no administrative role have the ability to polarize adjacent space structures due to the central role they hold. In this category there are included 17 villages in the conurbation: **Sântuhalm, Bârcea Mică, Mânerău, Săuleşti, Sântandrei, Bârcea Mare, Uroi, Cărpiniş, Batiz, Nădăştia de Jos, Nădăştia de Sus, Sâncrai, Valea Sângeorgiului, Calanu Mic, Strei, Tâmpa** and **Valea Nandrului**.

The seventh level, *the villages (s),* include those lsettlements that do not have central role structures (or do not meet the needs of the population) and do not benefit utilities (totally or partially). This category includes 18 settlements: **Archia, Răcăştia, Boş, Hăşdat, Simeria Veche, Streisângeorgiu Strei-Săcel, Ohaba Streiului, Grid, Sântămăria de Piatră, Petreni, Almaşu Sec, Chergeş, Cozia, Popeşti, Almaşu Mic, Josani** and **Nandru**.

On of last level, the eighth, are located *the remote villages (si)* having as the main impediment to normal development the territory position and extremely low demographic potential. In this category are included 5 villages: **Totia, Groş, Dumbrava, Ciulpăz** and **Cutin**.

The areas of influence of settlements in the conurbation

Establishing the theoretical influence zone for one or more settlements has a special meaning in the construction of the system of settlements, often is the last step before deciphering the mechanisms and spatial relations in a given territory. The reason why this step is performed latest has to do with the need to obtain data relating to the status of a settlement, rank that expressed the ability to polarize the geographic area.

Central places theory and Thiessen polygons method

Regardless of when or how this analysis is performed it is based on the theory of central places developed by Walter Christaller. The theory issued by Christaller is an economic one however with reference to a geographical space (ideal or isotropic). Just because the geographical area is complex and varied, not at all isotropic, areas of influence determined by Christaller's theory are called theoretical (or ideal) zones of influence.

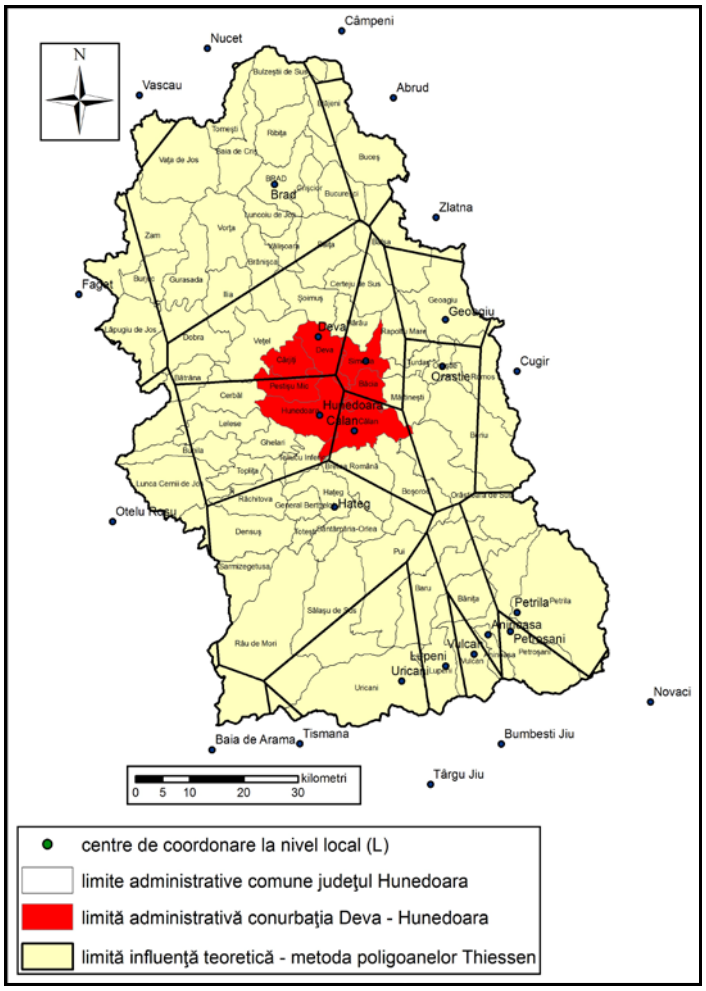

Fig. 10. Theoretical influence limit of local coordination centers - Thiessen method

The simplest method of determining the theoretical areas of influence respecting Christaller's theory (for all residents to be served by a central place) is the Thiessen polygon method. This method considers, that regardless of the arrangement in space of central places, the customer will head towards the nearest, therefore this method does not take into account the hierarchy of central places and the areas of influence thus created are presented as polygons.

The theoretical analysis of the influence area of local centers is a very important point in determining the area of influence of the conurbation. At this level of local coordination centers are best

visible the theoretical areas of influence, are visible the shortcomings of the urban settlements system (and distribution in space) and not least there can be outlined the territorial relationships that local centers have with adjacent space.

The Reilly - Converse gravity model

To completen the spatial analysis of the areas of influence of the settlements made with the Thiessen polygons method we can use the Reilly-Converse gravity model which is a way of calculating the the areas of influence which takes into account the number of inhabitants of settlements and the distance between them. Thus this model is used to establish more detailed boundaries between two areas of theoretical influence.

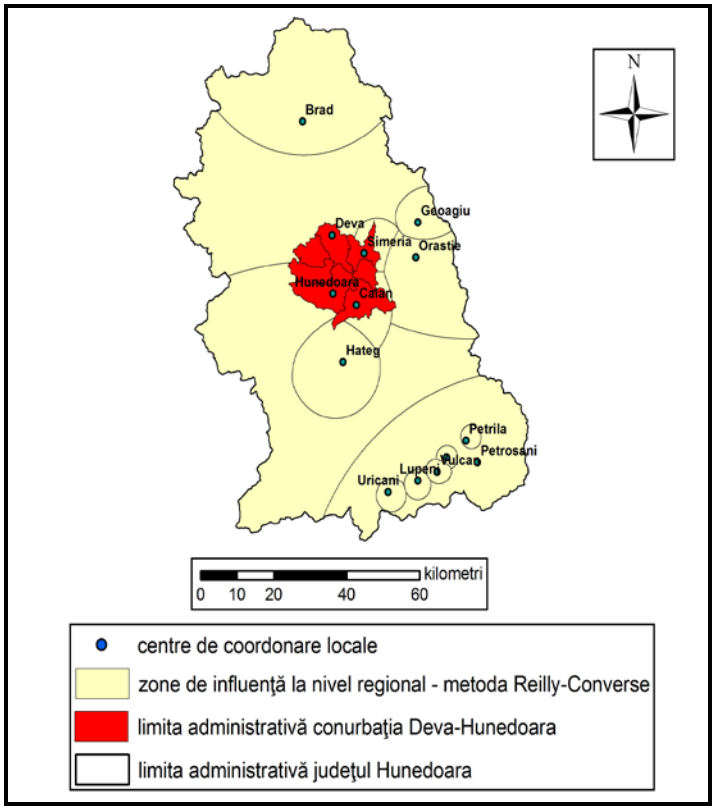

Fig. 11. Theoretical influence limit of local coordination centers - Reilly-Converse method

The results obtained using the Reilly-Converse method are clearly distinguishable from those obtained using the Thiessen polygons method, because of the number of parameters taken into account. Reilly-Converse method emphasizes the importance of the demographic factor in determining areas of influence and the importance of placement in space of the various coordination centers.

As a conclusion we believe that the Reilly-Converse method gives satisfactory results and closer to reality in the field by introducing in the equation the demographic factor and the actual

distance between settlements, however the fact that the method was developed on an isotropic space reduces the degree of generalization of results.

Areas of influence of central places

The determination of zones of influence based on the strength of polarization of the central places is the last important analysis and completes the delimitations obtained by the Thiessen polygon method and the Reilly-Converse method. The present delimitation is based on the quality and quantity of services provided by central places at different levels.

At the level of local coordination centers, the large number of urban settlements in Hunedoara County produces high fragmentation in the central and southern areas. At this level there are cases where the coordination center manages to polarize strictly villages in its administrative unit (ex: Uricani, Lupeni, Vulcan, Aninoasa and Petrila).

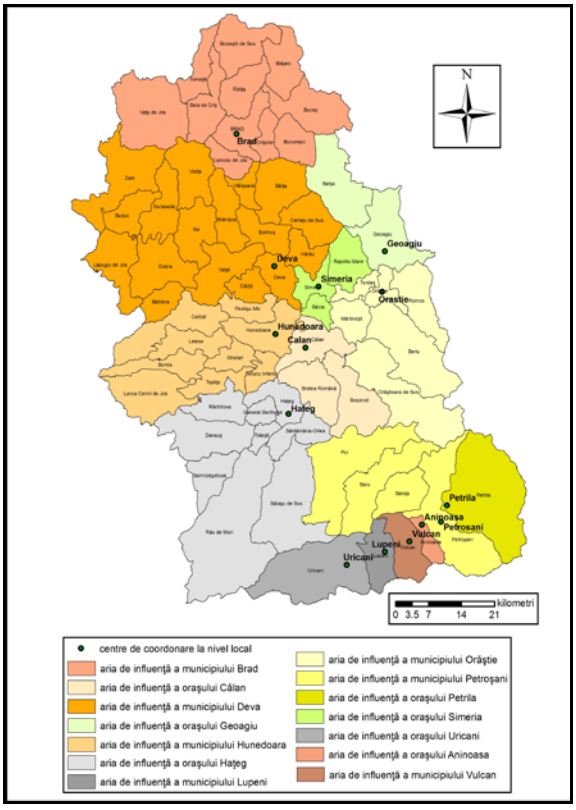

Fig. 12. Theoretical influence limit of local coordination centers - central place method

Conclusions

Areas of influence of the settlements in the conurbation are the result of the interaction between the spatial distribution, particularities of the transport system, topography, orographic barriers and not least central structures.

Depending on the level at which we refer features of areas of influence are influenced by the presence of central structures, thus at upper county levels (provincial and regional) an important role in delimiting areas of influence have the presence airports, universities, decentralized institutions and prestigious medical units. At county level administrative institutions are most important in determining areas of influence, the county currently representing the basic unit in the country's territorial administrative division.

At lower levels (regional and local) increases the role that the discontinuities of the relief and network of communication have in determining areas of influence. Along with these an important role is played by the presence of central places.

The main factors determining the dynamics of the zones of influence refer to communication network structure, the demographic factor and the central role facilities. The lower level for which this type of analysis was conducted is that of the local coordination centers, below this level the number of coordination centers greatly increases based on administrative relationships between settlements but also because of the large number of structures with central place role.

Deva - Hunedoara conurbation, structure, function and polarization in the territory

The territory of the conurbation is dominated by the Deva - Hunedoara bipol which occupies the central area leading to the creation of an intensly urban strip between the two cores. The rest of the conurbation can be viewed as having a predominant supporting role, of outsourcing of functions. In this space no settlement succeeds in having a quasi-independence from the central role facilities offered by the Deva-Hunedoara core despite the presence of two other urban centers, the dominant daily flows remain towards Deva and Hunedoara.

Dependent on the services offered by Deva and Hunedoara are also many areas outside of the conurbation, particularly those in close proximity. A good example are the settlements located north of the Mureş who depend on Deva for needs related to education, health and trade.

The two main towns with supporting role in the conurbation are Simeria and Călan, both former industrial cities, which manage to attract daily flows from the close discontinuity areas (Hunedoara Hills and East Orăştiei Hills).

Considering positioning, central role structures and relationships in the territory we can conclude without any hesitation, that the role of Deva-Hunedoara conurbation in the national settlement system will be that of regional center of territorial balance between the provinces of Banat and Transylvania, the equivalent of a municipality of rank I.

In light of the problems listed we understand that the influence of the conurbation at regional centers level will be limited. An extension of the conurbation’s area of influence outside the Hunedoara county is possible but unlikely due to competition with other regional centers. Practically a limited influence within his own county, the conurbation will take over the administrative function.

All that being said we believe without any hesitation that all the coordination centers identified in the first zone aim at supporting the conurbation and expanding its influence in the region and the centers of the second area are potentially competitive centers.

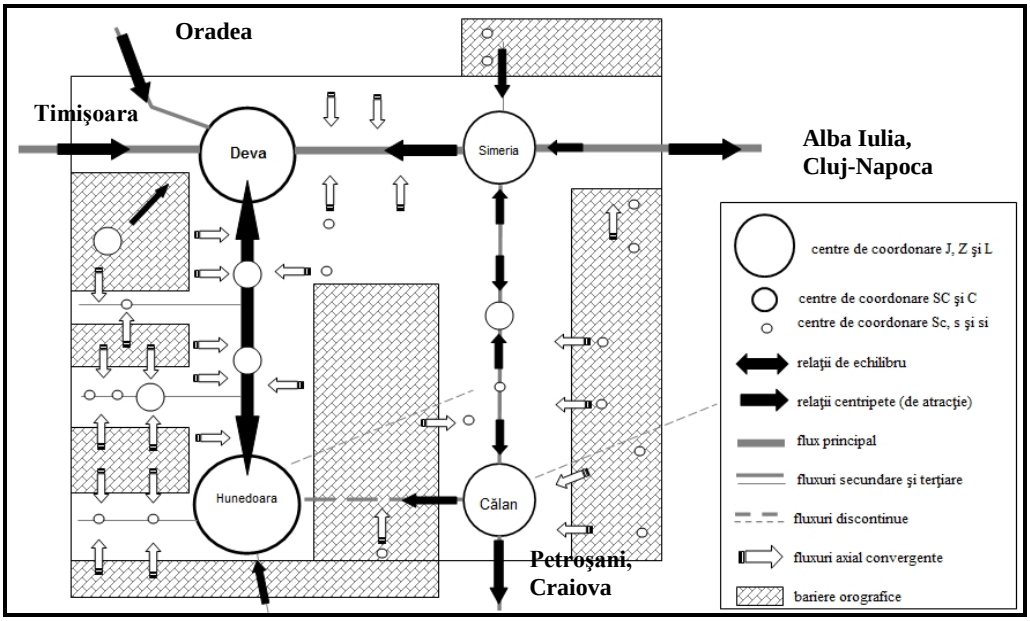

Fig. 13. Territorial conections

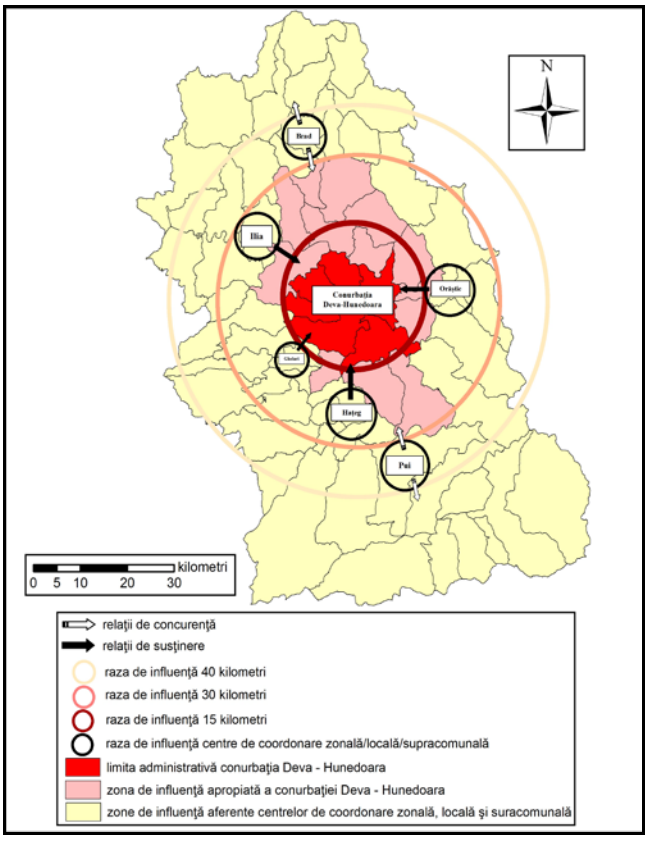

Fig. 14. Deva-Hunedoara conurbation - influences and relationships in the territory

8. Deva - Hunedoara functional dualism

The development and functioning of a conurbation is the result of collaboration between the territorial development, demographic resources and all functions, all of which are interrelated.

The current state of dualism between Deva and Hunedoara can be quantified by studying the working population of the two settlements and the study of the functional areas of the settlements.

Regarding the study of population in the city of Hunedoara we noticed that a high percentage of the population is engaged in manufacturing, respectively 29.60%, in total in the secondary sector, dominated by industry, being employed 41.05% of the active population. By contrast in the city of Deva the percentage of those working in the manufacturing sector is 21.11%, and in the secondary sector as a whole the percentage is 31.58%.

When referring to the share of people employed in the administrative system it is 6.78% in Deva and only 4.27% in Hunedoara. As it can be seen in Table 12 the opposite origin and evolution of the two municipalities is "betrayed" by their current specificity expressed by the share of population employed in different sectors.

The contrast between the industrial city, Hunedoara, and the bourgeois city of civil servants and traders Deva is seen not only through the occupational structure but also through functional areas.

Table 12. Distribution of active population in sectors of activity in Deva and Hunedoara

Sector de activitate (%)	industria prelucrătoare	total industrie - sector secundar	administrație publică	total sector terțiar
Deva	21,11	31,58	6,78	55,13
Hunedoara	29,60	41,05	4,27	40,54

Functional areas in Deva - Hunedoara conurbation

The conurbation’s analysis in functional terms is the basis of any future approach of planning and territorial restructuring with the express purpose of improving the life of people. Future interventions in the internal structure of the settlements must be substantiated and justified so that future technical utilities and commercial structures can be supported by the settlement and its inhabitants, to contribute to socio-economic development of the entire system and not least fall into the specifics of the settlement given by its historical evolution.

Areas with complex functions are represented in the conurbation by the urban centers Deva, Hunedoara, Simeria and Călan. These are areas that blend several functions necessary for everyday life of the inhabitants such as residential, commercial function, administrative function, industrial function, etc..

Secondary residential function areas are represented by the rural settlements of the conurbation. The typology of rural areas often requires that the main function of these areas be that of production, the secondary function being that of residence, rarely there can be identified a third function.

Transport corridors are areas that concentrate both secondary rezindential structures but mostly transit infrastructure. This infrastructure is composed of all the roads, rail and the structure of the national energy system, water and gas pipelines, telephone lines and other similar structures of information and material transport.

Farming areas are present in the whole conurbation however, their distribution and extent is influenced by morphological, hydrographic and anthropogenic factors. From the interaction of these three factors were formed two kinds agricultural areas, depending on their position and mode of operation: intensive agricultural areas and extensive agricultural areas.

Intensive farming areas are most favorable located in the territory,usualy in the floodplains and teraces of Mureş, Cerna and Strei and are characterized by a reduced fragmentation of land and a great possibility of mechanization.

Extensive farming areas are characterized by excessive fragmentation of parcels due to placement in more unfavorable areas. These are areas where agriculture is practiced mainly by rural population with the express purpose of ensuring the existence.

Forest and ecological protection areas are characterized by excessive a grouping due to morphological factors limitations.

Leisure and tourism areas are relatively underdeveloped in the conurbation, generally being located in the immediate vicinity of urban centers or in areas with increased natural tourism potential.

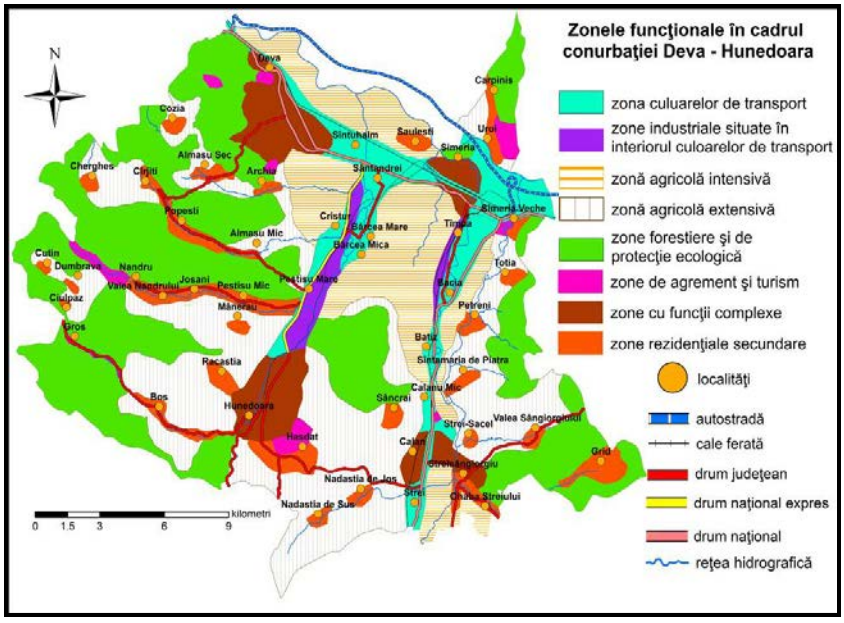

Fig. 15. Functional zoning and spatial suturing of Deva - Hunedoara conurbation

9. Development strategy of Deva - Hunedoara conurbation

Based on the existing state of affairs identified in previous chapters, and having determined that the ultimate goal is the spatial and socio-economic development of the conurbation we consider that the presentation of a set of measures of intervention and planning to develop the territory is a must.

The measures presented aim to develop the community, transport infrastructure, urban development, rural development, population and business, the environment and tourism. The plan of measures presented below is consistent with the development strategy of Hunedoara County (2007-2013) and with development plans of urban centers in the conurbation. There were introduced intervention measures and the resolvation to specific problems discovered during the preparation of this paper.

Objective 1: communitary development

The measures and ideas presented are derived from the need to create a governing body in the conurbation, body having the responsibility to develop and implement strategies and projects consistent with the principles of the proposed development for the conurbation.

Objective 2: transport and energy infrastructure

The measures presented aim to develop and upgrade the transport networks (road, rail and air) as best to integrate the conurbation in the area of development and increase accessibility. The energy objective aims to ensure power system stability under specific consumption growth.

Objective 3: Urban Development

The measures presented concerns urban development, encouraging rational territorial development, development of central role facilities, diversification of economic activity and the development of cooperation between urban centers in the conurbation. Through the steps listed is intended primarily the functional development of the conurbation and development of Deva - Hunedoara, Deva - Simeria, Simeria - Călan and Călan -Hunedoara axes.

Objective 4: Rural Development

The measures listed are thought as to improve life of people in rural areas and really include them in the conurbation. By the measures presented is also intended to reduce rural - urban discrepancy.

Objective 5: population and business environment

The measures presented are aimed at encouraging the development of human resources and business environment with the aim of diversifying economic activities and recovery training gaps of the population.

Objective 6: Environment

The measures presented aim to improve quality of the environment affected areas and promote sustainable development with the direct aim to reduce polluted areas that are currently unusable.

Improving the environment is one of the basic conditions for territorial development of conurbation to continue.

Objective 7: Tourism

The measures presented are aimed at promoting tourist areas and their integration into regional and national circuits to increase the prestige of Deva - Hunedoara conurbation.

Model of development for Deva - Hunedoara conurbation

Based on the previously proposed measures and the various analyzes of the conurbation we can propose a development model of areas with similar characteristics. Within these areas it is required the implementation of similar measures to help develop existing potential (natural and anthropogenic) in order to integrate the area in the conurbation system. Identification and development of an area after a general pattern does not exclude the possibility of developing other socio-economic activities if opportunities arise or if the status quo will require it.

The development of services, industry and transport areas superimposed on the main lines of force of the territory situated along the floodplains of Mureş, Cerna and Strei represents the main development area of the conurbation. Today the area is dominated by the urban centers, polarizing adjacent space and only encouraging nearby urban development.

The intensive agricultural development area will be located in the hills of East Hunedoara with two distinct components: in the north where generous leveling surfaces are present will be agricultural lands and in the south will prevail orchards and vineyards.

Area of ecological agriculture will include the northern part Deva hills and the eastern part of Nandru and Cozia hills. This area has highly fragmented agricultural property being used for semi-subsistence farming.

Forestry and agrotourism area will occupy a significant share in the conurbation and will include heavily forested areas in the western part of the conurbation. The areas with natural tourism potential natural will support the development of agro-tourism activities.

Agrotourism will be developed in parallel with the forestry industry which can become the main source wich generates capital for the development of the area. Wood harvesting in a sustainable measure will be the main industrial activity of the area, creating a complete cycle of exploitation.

Agritourism will be developed based on the valuable cultural heritage that the "pădurenii" hold. Tourist accommodation can be made in many existing traditional houses in the villages in the area. In addition to encouraging tourism and forestry it will also be encouraged the development of semi-subsistence agriculture.

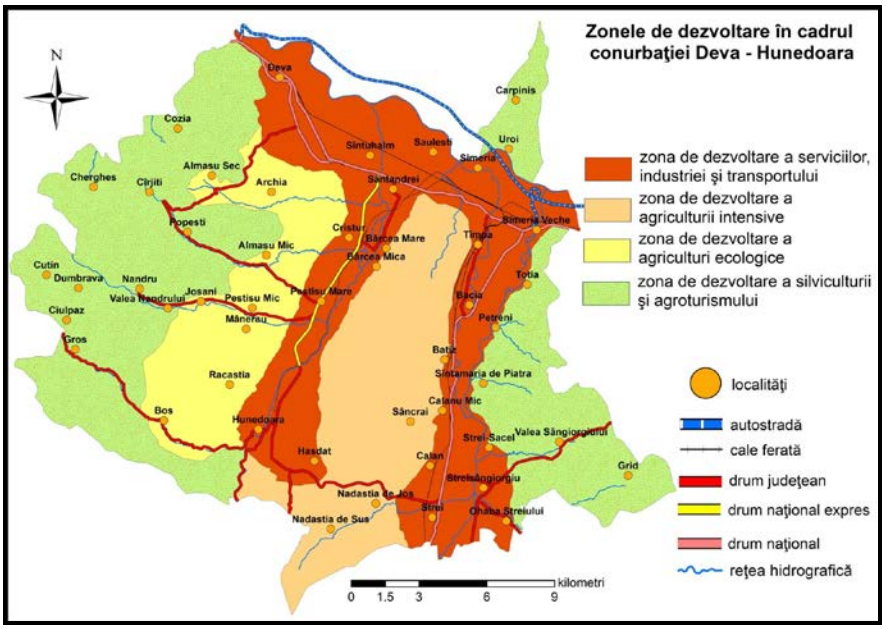

Fig. 16. Development areas in Deva - Hunedoara conurbation (processing after the development plans of Deva and Hunedoara and Hunedoara County Council)

General conclusions

Summarizing the vast information in this study it is required to give the following conclusions, brief but comprehensive:

1. Morphology is the first edifying factor of the conurbation through conditioning how anthropogenic structures are grafted onto the morphological substrate, seeing a "bundle" type agglomeration in meadow areas and feathering fingers in hilly and mountain areas.
2. Land use in the conurbation is balanced with the majority of land intended for agriculture (52.77%). With the current way of land use and study of future trends of change there will not result any imbalances with the evolving of the conurbation.
3. The study of population dynamics of conurbation during 1850 - 2011 shows an intense process of growth divided into four periods: moderate growth during 1850-1910, the 1910-1930 period marked by war and socio-economic instability, 1930-1992 period marked by an artificial increase as a result economic and demographic policies and the 1992-2011 period marked by a demographic decline due to external migration and low natural growth.
4. The administrative evolution of studied territory highlights centralization tend to reduce the number of administrative units.
5. The socio-economic and spatial evolution of the conurbation's settlements is due to collaboration between several socio-economic and political factors.
6. The major communication routes in the conurbation are the result of historical relationships developed between major urban centers as a result of increased socio-economic exchanges. The

system of roads, centered on the main force lines, represents the "nervous system" of the conurbation.

7. Endowment with central role is a true picture of the actual development of the conurbation. Through their territorial distribution, central role facilities create a series of relationships, attraction or repulsion, between the settlements of the conurbation giving rise to strong development areas situated between the urban settlements, along the lines of force of the territory.
8. Based on the analysis of central role facilities within the conurbation, geographical location and favorable environment in which it develops, the role of the conurbation in the national settlement system is equivalent to that of a rank I municipality.
9. Areas of influence of settlements in the conurbation are the result of interaction between the spatial distribution, particularities of the transport system, topography and orographic barriers and not least the central role structures.
10. Functional zoning within the conurbation derives from natural and anthropogenic constraints by the factors present. Favorable areas located in river floodplains or on their terraces become areas of intensive agriculture where large settlements and major transport routes are concentrated. In areas considered less favorable extensive agriculture areas develop, accompanying secondary residential areas (rural) as well as forestry and environmental protection areas.
11. Urban settlements are basically the ultimate result of human intervention in nature. Urban development involved the creation of all structures necessary for life in a small space.
12. The historical context in which Deva and Hunedoara evolved created different socio-economic conditions and hence the emergence of different functional areas and subareas. These areas, along with central role endowments in the individual settlements, give the specifics of the two poles: Deva administrative and cultural center and Hunedoara by excellence industrial center.
13. Strict delimitation of and quantification dualism is impossible, dualism must be regarded as a manifestation of informal social-economic relationships that exists between the two settlements that are equal parts in a conurbation.
14. The dualism formed between Deva and Hunedoara, based on the needs for mutual support in punctual areas, highlighted in the course of time, will fade with the development and territorial merge of settlements within the conurbation.

Given all those outlined above we consider that by the duality of the two main urban centers, Deva and Hunedoara, through the evolution trends, fusion and spatial continuity, by the intensity of links and their diversity, shared waste management, common management of water sources, overall high density of the population and intensive land use fully justified the existence of the conurbation whose analysis we made in this study.

Selective Bibliography

1. Bairoch, P. (1988), *Cities and Economic Developement*, University of Chicago Press, Chicago.
2. Bejeau-Garnier, Jaqueline, Chabot, G. (1971), *Geografia urbană*, (traducere) Editura Ştiinţifică, Bucureşti.
3. Bellu, R., (2006), *Mica Monografie a Căilor Ferate din România*, Editura Filaret, Bucurşti
4. Benedek, J. (2004), *Amenajarea teritoriului şi dezvoltarea regională,* Editura Presa Universitară Clujeană, Cluj - Napoca
5. Biarez, S. (1976), *Ideological planing and contingency programming: the case of the Lile - Roubaix - Tourcoing conurbation, 1967-1976* (articol scanat, localizat în baza de date J Store).
6. Carter, H. (1983), *An Introduction to Urban Historical Geography*, Edward Arnold Publishers.
7. Cândea, Melinda, Bran, Florina, (2001), *Spaţiul Geografic Românesc; Organizare, amenajare, dezvoltare durabilă*, Ed. Economică, Bucuresti.
8. Cipolla, C. - M., (1993). *Before the Industrial Revolution: European Society and Economy, 1000-1700,* London Press.
9. Cocean, P., Zotic, V., Puiu, V., Moldovan, C., (2010), *Amenajarea teritoriului suburban al municipiului Bistriţa*, Presa Universitară Clujeană, Cluj - Napoca.
10. Cucu, V. (1970), *Oraşele României*, Edit. Ştiinţifică, Bucureşti.
11. Cucu, V., Vlăsceanu, Gh., Urucu, V. (1987), *Oraşele milionare ale lumii*, Edit. Albatros, Bucureşti.
12. Drăgoescu, A. (coordonator)(1997), *Istoria României-Transilvania volumul I*, Editura "George Barițiu", Cluj-Napoca.
13. Floca, O., Şuiaga, V. (1936), *Ghidul judeţului Hunedoara*, Tipografia Românească, Deva.
14. Gaschet, F. (2002), *The new intra-urban dynamics: Suburbanisation and functional specialization in French cities*, Regional Science, RSAI.
15. Geedes, P.(1915*), Cities in evolution*, Williams & Norgate, London.
16. Green, N. (2007), *Functional Polycentricity: A Formal Definition in Terms of Social Network Analysis*, Urban Studies, vol 44, October 2007, Routlege Publishing.
17. Gusti, G. (1974), *Forme noi de aşezare. Studiu prospectiv de sistematizare macroteritorială*, Editura Tehnică, Bucureşti.
18. Healey, Patsy (2009), *City Regions and Place Development*, Regional Studies, vol 43, July 2009, Routlege Publishing.
19. Ianoş Gh., (2004), *Geografia solurilor cu noţiuni speciale de pedologie*, Editura Mirton, Timisoara.
20. Ianoş, I. (1987), *Oraşele şi organizarea spaţiului geografic*, Editura Academiei, Bucureşti.
21. Ianoş, I. (2000), *Sisteme teritoriale, o abordare geografică*, Ed. Tehnică, Bucureşti.
22. Ianoş, I., Humeau, J. - B.(2001), *Teoria sistemelor de aşezări umane*, Ed. Tehnică, Bucureşti.

23. Jacobs, Jane (1969), *The Economy of Cities*, Random House Inc, New York.
24. Knox, H. (2010), *Cities and organisation: The information city and urban form*, Culture and Organization, vol 16, September 2010, Routlege Publishing.
25. Lazăr, I.(2008), *Monografia oraşului Simeria*, Editura Emia, Deva.
26. Lăzărescu, C. (1977), *Urbanismul în România*, Ed. Tehnică, Bucureşti.
27. Lynch, A. - K. (1981), *Wath Is the Form of a City, and How Is It Made?* in Good City Form, MIT Press.
28. Mykhnenko, V., Turok, I. (2008), *East European Cities - Patterns of Growth and Decline, 1960 - 2005*, International Planning Studies, vol 13, Routlege Publishing.
29. Molnar, E., Maier, A., Ciangă, N. (1975), *Centre şi arii de convergenţă din România*, Studia Univ. Babeş-Bolyai, Seria Geographia.
30. Meeus S. - J., Gulinck H. (2008), *Semi-Urban Areas in Landscape Research: A Review*, Living Rev. Landscape Res., vol. 2.
31. Mills E. - S., Miesszkowsky P. (1993), *The causes of metropolitan suburbanization*. Jurnal of Economic Perspectives.
32. Nielsen, S. - B., Morten, E. (2000), *Assessing the potential for change in urban infrastructure systems*, Environmental Impact Assessment Review, Elsevier.
33. Oncu, M., (2000), *Culuarul Mureşului (sectorul Deva - Zam) Studiu Geoecologic*, Editura Focul Viu, Cluj – Napoca.
34. Parr, B. - J. (2004), *The Polycentric Urban Region: A Colser Inspection*, Regional Studies, vol 38, May 2004, Carlfax Publishing.
35. Parr, B. - J.(2007), *Spatial Definitions of the City: Four Perspectives*, Urban Studies, vol 44, February 2007, Routlege Publishing.
36. Păunescu, A. (1980), *Evoluţia istorică pe teritoriul României din paleolitic până la inceputul neoliticului*, Studii şi Cercetării de Istorie Veche şi Arheologie, nr. 31.
37. Popa R. (1988), *La începuturile Evului Mediu românesc. Ţara Haţegului*, Ed. Ştiinţifică şi Enciclopedică, Bucureşti.
38. Reid, H. - E.(2008), *Caracteristics, Causes, and Effects of Sprawl: A Literature Review*, Urban Ecology, vol 21, Springer, 2008.
39. Resmeriţă, I. (1972), *Vegetaţia din jurul Devei*, Sargeţia, Seria Ştiinţe naturale, Publicaţie a Muzeului Civilizaţiei Dacice şi Romane Deva.
40. Robinson, G. W. S., *British Conurbations in 1951*(articol scanat, localizat în baza de date J Store).
41. Rodriguez - Pose, A. (2008), *The Rise of the "City-region" Concept and its Development Policy Implications*, European Planning Studies Vol. 16, No. 8, September 2008, Routlege Publishing.

42. Romein, A. (2004), *Spatial planing in competitive polycentric urban regions: some practical lessons from Northwest Europre*, in CityFutures –An international conference on globalism and urban change, Chicago.
43. Romulus, V. - I.(2007), *A doua epistolă către hunedoreni*, Ed. "Neutrino", Reşiţa.
44. Rusu, R. (2007), *Organizarea spaţiului geografic în Banat*, Editura Mertom, Timişoara.
45. Surd, V. (2001), *Geodemografie*, Edit. Presa Universitară Clujeană, Cluj-Napoca.
46. Surd, V. (2003), *Geografia aşezărilor*, Edit. Presa Universitară Clujeană, Cluj-Napoca.
47. Surd, V., Bold, I., Zotic, V., Chira, Carmen (2005), *Amenajarea teritoriului şi infrastructuri tehnice*, Edit. Presa Universitară Clujeana, Cluj-Napoca.
48. Surd, V., Puiu, V., Păcurar, B., Cepoiu, Loreta, Zotic, V., Bărăian., S. (2013), *Planul Urbanistic General al Municipiului Cluj -Napoca. Matricea Geografică*
49. Stobart, J. (2003), *Identity, Competition and place promotion in the Five Towns*, Jurnal of Urban History, nr. 30, 2003, Cambridge University Press.
50. Svodoba, T.(2009), *Cărbunele şi drumurile sale de fier*, Caietele Petro - Aqua, Petroşani.
51. Sykora, L., Mulicek, O. (2009), *The micro-regional nature of functional urban areas (FUAs): lessons from the analysis of the Czech urban and regional system*, Urban Research and Practice, vol 2, November 2009, Routlege Publishing.
52. Şuiaga; V.(2010), *Deva - Contribuţii monografice*; vol. 1; Editura Emia; Deva.
53. Tănăsescu, C., (1985), *Date privitoare la oraşul şi cetatea Devei în secolele VI şi XVII*, Sargeţia, vol XVIII-XIX
54. Varga E. Árpád (1999) în: *Recensământul din 1910 Transilvania*, Traian Rotariu (coordonator), Maria Semeniuc, Mezei Elemér Editura Staff, Bucureşti.
55. Yang, Y., Zang, H., Wang, X. - R., Schoubert, U., (2010), *Urban Land-Zoning Based on Ecological Evaluation for Large Conurbations in Less Developed Regions: Case Study in Foshan, China*, Journal of Urban Planning and Development, ASCE
56. Zotic, V. (2005), *Componentele operaţionale ale organizării spaţiului geografic*, Ed. Presa Clujeană, Cluj - Napoca.