EVALUATION OF FUNCTIONAL URBAN AREAS IN THE NORTH-EAST REGION

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Abstract

Metropolitan areas concentrate a large part of the population, production and consumption in the European Union countries. One of the main problems that arises when adopting metropolitan areas as territorial units of analysis and policy development in European countries is the lack of generally accepted standards for identification purposes. This paper has proposed a scientific evaluation of the functional areas (including metropolitan areas) of county capital of North East Region. For this purpose it was used the ESPON 1.1.1 methodology regarding polycentric development adapted to the realities in Romania and then evolving development of economic analysis for each functional area (metropolitan area) studied. The study shows that functional urban areas (including metropolitan areas) are still in the early stage of organisation, with no significant progress in their economic development.

***Key words**: metropolitan areas; functional urban areas; ESPON methodology; North-East Region*
***JEL Classification**: R11, R12, R58*

1. Introduction

1.1. Territorial Cohesion Policy

Europe 2020 Strategy on EU cohesion policy after 2013, focusing on smart, sustainable and inclusive growth. This policy initiative is based on the premise that:

1. Cities have a decisive importance for Europe's competitiveness;
2. It is very important connectivity between highly developed and specialized places and metropolitan areas with good accessibility;
3. Networks at different geographic scales link global markets;

4. Good governance and territorial cooperation are vital for the implementation of economic and social cohesion (European Commission, 2013).

Territorial Agenda of the European Union 2020 (Budapest, 2011) aimed mainly "A smart, sustainable and inclusive of Diverse Regions". The European Union considers that the objectives defined in the Europe 2020 strategy for smart, sustainable and inclusive growth can only be achieved if you consider the territorial dimension of the strategy, as development opportunities vary from one region to another. (European Commission, 2011).

Thinking of urban places with their associated rural hinterland and spheres of influence has become complex. Clusters of urban places, their situation in a globalizing world and changing accessibility for fast transportation modes are some new factors that affect the change of traditional European cultural landscapes (Antrop, 2004).

The literature is reflected problems of big cities metropolisation process according to studies polycentric. Polycentric development is currently considered a useful tool for spatial planning to increase the competitiveness of cities, social cohesion and environmental sustainability (Davoudi, 2003). Polycentric areas can be conceptualized according to two basic approaches: a purely morphological the polycentric areas can be seen as a model of spatial organization middle ground between traditional compact cities and urban sprawl, preserving the advantages associated with compact cities, with respect trends spontaneous dispersion (Camagni, 2002), and on the other hand, adopting an approach both functional and morphological the polycentric areas represent alternative monocentric areas (Meijers and Sandberg, 2008), consisting of a progressive integration urban centers into a single metropolitan area. Basic elements of Polycentric development are functional urban areas (FUAs). A functional urban area consists of an urban core and the area around it, which is economically integrated with the center. Polycentric development rapidly has become a widely spread paradigm in regional development policies on a variety of spatial scales (Davoudi, 2003).

Clearly, the impact of urban areas on the human population and the global environment is significant, and will become even more pronounced in the future (Mills, 2007). For example, a series of papers have shown that polycentric cities offer opportunities for substantial commuting economies, and that work-trip savings compared with a monocentric city are larger outside the central city than inside. As a result, congestion does not increase with city size (Gordon et al, 1989). Polycentric approaches facilitate achieving benefits at multiple scales as well as experimentation and learning from experience with diverse policies. (Ostrom, 2010). Functional urban

areas are the building blocks of a polycentric region. Polycentric regions are established by two or more functional urban areas mutually reinforcing. Using a traditional morphologic approach, an urban area can be defined polycentric if its employment is not concentrated in a single centre, but it is distributed in two or more centers (Riguelle, 2007). A perfect polycentric system would offers the two major economic advantages of urban systems: the presence of agglomeration economies, which result in increasing returns for companies, and a potential reduction of transport costs (including time) (Tressera, 2012). Since the early 80s, English School has developed a new vision for cities and metropolitan areas. According to this view, as new cities and metropolitan areas was related to the concentration of functional areas, which has become increasingly important for global economic networking. (Cheshire and Hay, 1989). French Study "Les Villes européennes" was one of the earliest and most influential studies of European cities and metropolitan areas. This study was developed in 1989 by Roger Brunet, on behalf of the DATAR, a French authority responsible for spatial planning. In the study, 165 metropolitan areas in Western Europe, with more than 200,000 inhabitants, were investigated. 16 indicators in various areas were analysed such as population, economy and companies (multinational), research, finance, transport and communications nodes, cultural institutions etc. Based on these indicators were defined functional specializations of metropolitan areas and classified by an aggregate index (Brunet, 1989). Despite good progress, research on metropolitan regions is still necessary. This is especially true in terms of identifying the theoretical background of metropolitan functions and classifying them systematically, updating their empirical bases, analyzing the places investigated on a European wide basis and selecting them more carefully. In addition, a European wide regionalization, based on common criteria, is still missing. (Federal Institute for Research on Building Urban Affairs and Spatial Development, 2011). The development of Europe's economic territory today can be characterized as a process of metropolisation of economic development potentials and innovation capacities (Krätke, 2007). First, the new urban policy is organized differently: it now involves partners other than public authorities, often including (parts of) the population of the areas in question. There seems to be a shift from government to governance. (Andersen, 2003). Local governance in metropolitan areas is strongly defined and shaped by its relationship to civil society (Feiock, 2004). The new vision of spatial planning at European level, but also at globally level, is development of cities as intelligent metropolitan areas. The term "intelligent" implies, in particular, implicit or explicit ambition of a city to improve standards of economic, social and environmental conditions and therefore its competitiveness in urban competition (Giffinger

et al., 2010). Inter-city networking is considered the way forward to address metropolisation by allowing a partial transfer of competences to facilitate polycentricity (Deraëve, 2014). Promote polycentric and balanced territorial development the main challenge is correct delineation of functional urban areas. An important role in functional urban areas is to increase mobility, which requires an integrated approach to transport policy (Appert, 2004). The territory of these functional urban areas should be scientifically defined as a critical mass so that development strategies to make sense and be effective.

1.2. Models for assessing functional urban areas

Polycentric development is regarded as a key tool for promoting social cohesion (Meijers and Sandberg, 2008), economic competitiveness (Hague and Kirk, 2003) and environmental sustainability (Committee on Spatial Development, 1999). According to the program ESPON 1.1.1., there are 3 dimensions of polycentrism that can be combined in a common indicator: the size and equipment of cities (population, economic activity, human capital, higher education, cultural importance, administrative status, etc.); their distribution in space and the interaction between cities that are same rank and those that are of different rank in the hierarchy of urban. Key concepts related to polycentrism are urban agglomerations (UA) and functional urban areas (FUA). **Urban agglomerations (UA)** refers to the urban center adjacent areas where the population in urban environments is an important factor in the analysis; it can be argued that only agglomerations above a certain threshold (eg. 20 000 population in Romania) can be labeled as urban areas.

Functional urban areas (FUA) are represented by the urban and surrounding areas where commuting (cities and towns in the vicinity). At European level, Functional Urban Area don't have a common definition. Data commute on LAU 2 are prerequisites to define functional urban areas. Several European studies defines Functional Urban Areas (Functional Metropolitan Areas) based on the commute to work reflecting the level of 25% of commuters to the city core of the economically active population, Evers for instance, argued that commuting can be considered as a substitute to migration if work and residence are geographically separated, but that they can be also considered as a complement if a person chooses to move away from their workplace locality, and then commutes to work on a daily basis. (Evers, 1985).

One of the bottlenecks in Romania on the assessment of polycentric development of the settlements network is the data on the volume of commuters, data not statistically monitored and consequently missing from the list of quantifiable indicators of National Institute of Statistics.

2. Methodology

2.1. Evaluation of Functional Urban Areas

Assessment methodology is based on functional urban areas ESPON 1.1.1 study. Lack of data on commuter flow around large cities in Romania, determines the need for approximation functional urban areas with Potential Urban Strategic Horizons (PUSH according ESPON). In this regard calculate travel time by car from core city centers (centroids FUA) to each node of the network traffic and travel times based on these isochronous constructed. For purposes of this study were built isochronous 30 minutes. How travel time should be calculated for an unloaded network, ie without taking into account traffic flows, it is assumed that the threshold for the vehicle ran 30 minutes would translate into real life in a time of 45 to 60 minutes. For the case of the national territory is equivalent to the average length of time commuting. Consequently, the results of this step are isochronous for each FUA. (Nordregio, 2004)

Statistical analysis purposes and for assigning FUA localities, such isochronous approximates the second step to the borders of the village. Isochronous overlap with municipalities borders and if overlap to some extent, the Territorial Administrative Unit is considered part of Potential Urban Strategic Horizon (PUSH). To evaluate the existing metropolitan areas, but also for evaluation of possible metropolitan areas has created a database of all Potential Urban Strategic Horizons (PUSH). For each county capital of North-East Region was designed a database that contains the Administrative Territorial Units components according PUSH evaluation results, using indicator evolving population (population 2005, 2008, 2013) and the number of employees in progress indicator (employees in 2005, 2008, 2013). Based on these data we can evaluate the potential for developing of Strategic Urban Areas corresponding PUSH methodology for each county capital of North-East Region. At the national level can be defined four types of zones according to evolving indicators studied: growing urban socio-economic areas, stabilized areas, stagnant areas and areas in economic decline.

2.2. Structure methodology

Methodology for assessing functional urban areas (FUA) draws on the polycentric methodology (ESPON 1.1.1.) and the use platform of Geographic Information Systems (GIS). Currently GIS techniques based on aerial or satellite imagery have been used to identify metropolitan areas worldwide (Brezzi, 2012).

The methods that combine commuting flow between information and statistical analysis based on GIS are the best choices for the delimitation of metropolitan areas worldwide. (Li et al., 2010).

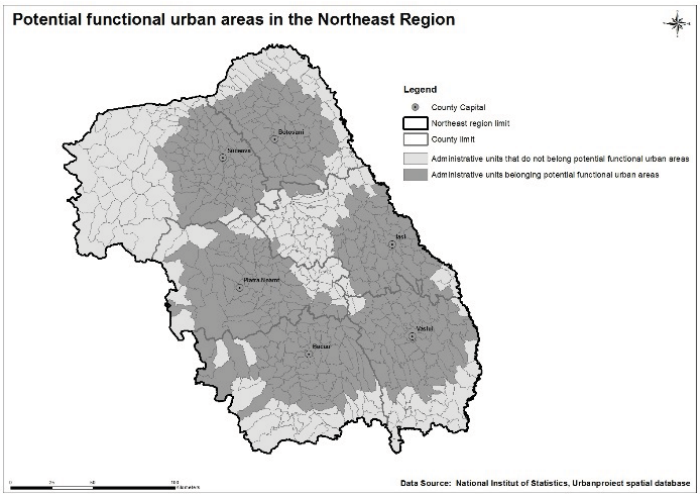
The quantitative and cartographic approach facilitates rapid conveying the results to policy makers. In addition, successive iterations to check the impact related to different alternative planning scenarios can be quickly performed. (Marull et al., 2007).

The first step is to calculate the average duration of the trip with a vehicle of Functional Urban Centers (centers county capital) to each node of the network traffic and based on these travel times are built isochronous. For the purposes of this study were constructed isochronous 30 minutes. GIS spatial database requires three basic layers: a layer of build able localities (to calculate the location of their centroids), a layer of detailed road network with legal speed limits to calculate travel times and a layer of administrative territorial limits of Romania. In order to evaluate the statistical analysis and functional urban areas, such isochronous approximates the second step to the boundaries of territorial administrative units.

Izochronous reach a certain percentage of administrative-territorial units and areas where overlap to some extent, these administrative units are considered as part of potential urban strategic horizon (PUSH) (Kloosterman, 2001). For analysis study, it considered variant when izochronous built cover at least 50% of the administrative-territorial unit - there is overlap more than half of the LAU 2 (Fig.1). In stage III, for each county capital of North-East Region and administrative territorial units from stage II, has developed a spatial database containing evolving territorial indicators.

Potential functional urban areas in the Northeast Region

Fig. 1



3. Results

3.1. Functional urban areas of the county capital from North-East according the ESPON methodology for delimitation Potential Urban Strategic Horizons (PUSH)

In the North-East region included some metropolitan structures (in various stages of organization), representing the association of a municipality with neighboring territorial administrative units, some established as IDAs (ADI), considering the influence that the urban center has on them. (North-East Regional Development Plan 2014-2020, 2013).

According to this methodology, we identified the following functional urban areas for the county capitals of North-Est region:

Bacău municipality

Administrative-territorial units components: Bacău, Ardeoani, Bereşti-Bistriţa, Bereşti-Tazlău, Berzunţi, Blăgeşti, Buhoci, Buhuşi, Cleja, Coloneşti, Damieneşti, Faraoani, Filipeni, Filipeşti, Garleni, Gioseni, Helegiu, Hemeiuş, Horgeşti, Iteşti, Izvoru-Berheciului, Letea Veche, Livezi, Luizi-Călugăra, Magireşti, Măgura, Mărgineni, Negri, Nicolae Bălcescu, Odobeşti, Onceşti, Palanca, Panceşti, Parava, Parincea, Pârjol, Plopana, Poduri, Prăjeşti, Răcăciuni, Racova, Roşiori, Sănduleni, Sărata, Sauceşti, Scorţeni, Secuieni, Solont, Strugari, Tămaşi, Traian, Ungureni.

Administrative-territorial units already established for Bacău Metropolitan Area: Bacău, Bereşti-Bistriţa, Buhoci, Faraoani, Filipeşti, Gioseni, Iteşti, Izvoru Berheciului, Letea Veche, Luizi-Călugăra, Măgura, Mărgineni, Nicolae Bălcescu, Odobeşti, Prăjeşti, Sărata, Săuceşti, Secuieni, Tamaşi şi Traian.

Notes: Bacău metropolitan area is included in the estimated functional urban area Bacău.

Botoșani municipality

Administrative-territorial units components: Administrative-territorial units components: Botoşani, Băluşeni, Blandeşti, Braeşti, Broscăuţi, Bucecea, Copalau, Cordăreni, Corlăţeni, Corni, Cosula, Cristeşti, Curteşti, Dangeni, Dimacheni, Frumuşica, Gorbăneşti, Leorda, Mihai Eminescu, Nicşeni, Rachiti, Roma, Săveni, Stăuceni, Ştiubeni, Suliţa, Truseşti, Tudora, Ungureni, Unteni, Văculeşti, Varfu Câmpului, Vlădeni, Vlăsineşti, Vorniceni, Vorona.

The metropolitan area consists of Botoșani municipality, Mihai Eminescu, Stăuceni, Răchiţi, Curteşti şi Roma, to be extended UAT-urile Bucecea, Vlădeni, Corni şi Vorona.

Notes: Botoşani metropolitan area is fairly new established, administrative units component being part of the estimated functional urban area Botoşani.

Iaşi municipality

Administrative-territorial units components: Iaşi, Aroneanu, Barnova, Ciurea, Comarna, Costuleni, Dobrovăţ, Dolheşti, Dumeşti, Erbiceni, Golăieşti, Grajduri, Holboca, Horleşti, Ipatele, Leţcani, Mădârjac, Mironeasa, Miroslava, Mogoşeşti, Movileni, Podu Iloaiei, Popeşti, Popricani, Prisăcani, Probota, Rediu, Romaneşti, Scânteia, Scheia, Schitu Duca, Tibana, Ţigănaşi, Tomeşti, Tutora, Ungheni, Valea Lupului, Victoria, Voineşti.

Territorial administrative units constituting Iaşi Metropolitan Area are: Zona Metropolitană Iaşi are: municipiul Iaşi, Aroneanu, Bârnova, Ciurea, Holboca, Leţcani, Miroslava, Popricani, Rediu, Schitu Duca, Tomeşti, Ungheni, Valea Lupului şi Victoria.

Notes: Iaşi metropolitan area has a balanced spatial distribution territory, based urban center and its area of influence, covering functional, a large territory. Iaşi metropolitan area is included in the estimated functional urban area Iaşi.

Piatra Neamt municipality

Administrative-territorial units components: Piatra Neamţ, Agapia, Alexandru cel Bun (Viişoara), Bahna, Baltateşti, Bărgăuani, Bicaz, Bodeşti, Borleşti, Candeşti, Costişa, Crăcăoani, Dobreni, Dochia, Dragomireşti, Dumbrava Roşie, Făurei, Garcina, Ghindăoani, Girov, Grumăzeşti, Hangu, Icuseşti, Mărgineni, Negreşti, Pangarati, Pastraveni, Petricani, Piatra Şoimului, Podoleni, Războieni, Rediu, Romani, Roznov, Ruginoasa, Săvineşti, Ştefan cel Mare, Tarcău, Tasca, Tazlău, Tibucani, Tupilaţi, Valea Ursului, Văleni, Zăneşti.

The metropolitan area consists of Piatra Neamţ municipality, Gârcina, Alexandru cel Bun, Dumbrava Roşie, Girov, Săvineşti, Roznov, Zăneşti şi Piatra Şoimului.

Notes: Metropolitan area Piatra Neamţ is newly established (2013) and the administrative-territorial component is part of estimated functional urban area Piatra Neamţ.

Vaslui municipality

Administrative-territorial units components: Vaslui, Albeşti, Alexandru Vlahuţă, Bălteni, Bogdana, Bogdăneşti, Bogdăniţa, Boteşti, Buneşti-Avereşti, Codăeşti, Costeşti, Cozmeşti, Creţeşti, Dăneşti, Deleni, Deleşti, Dragomireşti,

Duda-Epureni, Fereşti, Ghergheşti, Hoceni, Huşi, Iana, Ibăneşti, Ivăneşti, Laza, Lipovăţ, Micleşti, Muntenii de Jos, Muntenii de Sus, Negreşti, Olteneşti, Oseşti, Poieneşti, Puieşti, Pungeşti, Puşcaşi, Rebricea, Roşieşti, Soleşti, Ştefan cel Mare, Tăcuta, Tanacu, Tătărani, Văleni, Voineşti, Vultureşti, Zapodeni.

Vaslui metropolitan area was formed in 2014, consisting of Vaslui and Muntenii de Sus, with the desire to extend to other 10 communes.

3.2. Economic analysis of the study

As mentioned in the methodology was created for each county capital a spatial database containing administrative units belonging to the estimated functional urban areas. Each functional estimated urban area contains indicators related to evolving population (population 2005, 2008, 2013) and evolving number of employees (employees in 2005, 2008, 2013). Evaluation indicators ensure minimal research functional urban areas estimated and ranked on the four types of economic zones mentioned in the methodology.

Table 1 presents the evaluation of functional urban areas (FUA) Bacău. Bacau functional urban area has a population insignificant decrease in period 2005-2008 and a population slight decrease in period 2009-2013. Instead, Bacău municipalities had a steady population decline during 2005-2013, losing almost 10,000 inhabitants (5% of the population). The number of employees increased significantly in period 2005-2008, followed by a significant decrease in 2008-2013 period. Bacău had the same trend as FUA Bacău, the number of employees in 2013 was lower than the number of employees in 2005. In the current economic situation PUSH Bacău is not still a stable functional area and can be cataloged as a stagnant area.

Table 2 presents the evaluation of functional urban areas (FUA) Botoşani. Urban Functional Area Botoşani has a steady decline in population since 2005 and Botoşani municipalities has a relatively slow population decrease during 2005-2013 period. Number of employees, both in Botoşani FUA and Botoşani municipality, has a very slow growth in 2005-2008 period and a slight decrease in 2008-2013 period. We observe a very low ratio between number of employees and the total population, both in Botoşani FUA and Botoşani municipalities. This demonstrates a fairly static areas that require investment to become competitive. According to the methodology Botosani FUA can be categorized as a stagnant zone.

Table 3 presents the evaluation of functional urban areas (FUA) Iaşi. In FUA Iaşi and Iaşi municipalities find an average population growth in 2005-2008 period and a large population increase during 2008-2013 period. The population growth is offset in 2005-2008 period by a rapid increase of the number of employees. But in 2008-2013 period, there was a growing

population in the both areas and an average decrease of employees in FUA Iaşi and a decrease of employees in Iaşi municipalities. Even if the evolution of the population had a positive trend, from the economic point of view FUA Iaşi can be categorized as a stagnant zone.

Table 4 presents the evaluation of functional urban areas (FUA) Piatra Neamţ. For FUA Piatra Neamţ and Piatra Neamţ municipalities, we find a slight population decrease during the study period 2005-2013. For the number of employees notice insignificant increase in 2005-2008 period and a slight decrease in 2008-2013, both FUA Piatra Neamţ and for Piatra Neamţ municipalities. Also, we note a low ratio between the number of employees and the total population, which constitutes an impediment to the development of the study area. In conclusion, FUA Piatra Neamţ can be seen as a stagnant area.

Table 5 presents the evaluation of functional urban areas (FUA) Suceava. The situation in FUA Suceava is similar in Suceava municipalities. There is a slight population increase in FUA Suceava and a relatively stable population in Suceava municipalities. The number of employees increased slightly to FUA Suceava and Suceava municipalities 2005-2008 period, followed by a decrease of number of employees in 2013 lower than 2005, both FUA Suceava and for Suceava municipalities. We ascertain a economic fragility of the FUA Suceava and a low ratio between the number of employees and total population. FUA Suceava can be seen as a stagnant area.

Table 6 presents the evaluation of functional urban areas (FUA) Vaslui. FUA Vaslui has a steady decline in population, while Vaslui municipalities has a slight population decrease in 2005-2008 period, after which a slight increase in 2008-2013 period. The number of employees had a slight increase in the FUA Vaslui and Vaslui municipalities in 2005-2008 period, followed by a moderate decline in 2008-2013 period. But the big problem for achieving a functional urban areas Vaslui is the very low ratio between number of employees and the total population. For this reason FUA Vaslui can be considered as an area of economic decline.

4. Conclusions

Cities are the engines of regional economy and can be considered catalyzing agent for creativity and innovation today. Metropolisation big cities is a process of attracting new specific activities, jobs and people, relying predominantly on competitiveness. Asserting smart metropolitan areas in Europe requires a new strategy to maximize integrated development of big romanian cities. Metropolitan area change over space and time, reflecting the evolution of

economy and society (Boix, 2012). In this regard, it is imperative to achieve a diagnosis that redefine real functional urban areas of the county municipalities and highlighting socio-economic typology, functional specializations and intelligent functional specializations of functional urban areas.

The territory of these functional areas must be scientifically defined as a critical mass so that development strategies to make sense and be effective. Due to lack of generally accepted standards for the identification of functional urban areas, this study seeks to contribute to solving one of the main problems that arises when adopting metropolitan areas as units of analysis and policy in European countries.

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Annexes

Evaluation of functional urban areas (FUA) Bacău

Table 1

County	UAT Name	Employees 2005	Employees 2008	Employees 2013	Population 2005	Population 2008	Population 2013
Bacau	**BACAU Municipalities**	57773	63673	53342	181126	178135	172697
Bacau	**BUHUŞI City**	2796	2904	2491	20176	19853	19109
Bacau	ARDEOANI	204	458	178	2537	2505	2371
Bacau	BERESTI-BISTRITA	211	261	114	3446	2084	2178
Bacau	BERESTI-TAZLAU	355	319	236	5779	5794	5691
Bacau	BERZUNTI	105	178	127	5423	5390	5316
Bacau	BLAGESTI	160	165	547	7278	7336	7447
Bacau	BUHOCI	187	167	191	4964	4999	4943
Bacau	CLEJA	447	353	214	7050	7079	6978
Bacau	COLONESTI	67	72	55	2196	2249	2157
Bacau	DAMIENESTI	76	72	65	1938	1912	1831
Bacau	FARAOANI	231	273	192	5607	5555	5313
Bacau	FILIPENI	65	83	82	2359	2344	2225
Bacau	FILIPESTI	270	305	263	4645	4737	4768
Bacau	GIOSENI	75	86	94	6641	6779	6957
Bacau	GIRLENI	357	433	388	0	3643	3926
Bacau	HELEGIU	199	208	235	7367	7212	6921
Bacau	HEMEIUS	444	720	939	4114	4459	5230
Bacau	HORGESTI	104	154	127	4866	4864	5016
Bacau	ITESTI	44	79	91	0	1527	1684
Bacau	IZVORU BERHECIULUI	43	56	60	1710	1734	1714
Bacau	LETEA VECHE	331	503	561	5201	5751	7003
Bacau	LIVEZI	183	162	168	5321	5383	5333
Bacau	LUIZI-CALUGARA	159	179	158	5397	5318	5195
Bacau	MAGIRESTI	150	139	89	4566	4518	4444
Bacau	MAGURA	388	379	301	4298	4532	5134
Bacau	MARGINENI	692	773	601	8820	9224	10017
Bacau	NEGRI	91	200	193	2961	2930	2794
Bacau	NICOLAE BALCESCU	1124	1136	780	9262	9468	9546
Bacau	ODOBESTI	65	102	85	0	2432	2620
Bacau	ONCESTI	77	51	52	1841	1767	1667
Bacau	PALANCA	126	152	106	3660	3570	3386
Bacau	PARAVA	134	124	136	4396	4373	4361
Bacau	PARINCEA	157	188	203	3436	3462	3493
Bacau	PARJOL	170	188	196	3906	3888	3756
Bacau	PINCESTI	108	117	144	6871	6782	6561
Bacau	PLOPANA	93	96	110	3437	3434	3337
Bacau	PODURI	168	234	243	8121	8139	8189
Bacau	PRAJESTI	96	86	48	0	2639	2629
Bacau	RACACIUNI	389	654	499	8114	8303	8374
Bacau	RACOVA	272	370	172	3375	3479	3515
Bacau	ROSIORI	67	61	60	2256	2296	2280
Bacau	SANDULENI	115	126	118	4492	4503	4462
Bacau	SARATA	64	116	374	2181	2326	2600
Bacau	SAUCESTI	208	453	308	4528	4850	5590
Bacau	SCORTENI	107	114	96	3150	3144	3030
Bacau	SECUIENI	93	80	72	4530	2141	2130
Bacau	SOLONT	115	139	122	3921	3844	3625
Bacau	STRUGARI	63	61	59	2624	2591	2574
Bacau	TAMASI	159	163	255	6643	3256	3241
Bacau	TRAIAN	311	186	203	5548	2967	2917
Bacau	UNGURENI	104	174	98	3748	3916	3919
TOTAL		**70.592**	**78.525**	**66.641**	**415.826**	**415.416**	**412.194**

Evaluation of functional urban areas (FUA) Botoșani

Table 2

County	UAT Name	Employees 2005	Employees 2008	Employees 2013	Population 2005	Population 2008	Population 2013
Botosani	**BOTOȘANI Municipalities**	33724	35639	31523	117563	116669	113766
Botosani	**BUCECEA City**	417	405	321	5270	5197	5173
Botosani	**SĂVENI City**	961	1048	798	8322	8165	7763
Botosani	BALUSENI	109	106	112	5091	5009	4911
Botosani	BLANDESTI	44	57	41	2371	2375	2208
Botosani	BRAESTI	48	70	60	2168	2133	2048
Botosani	BROSCAUTI	61	80	85	3508	3447	3354
Botosani	COPALAU	115	143	90	4250	4232	4083
Botosani	CORDARENI	71	62	39	2145	2064	1880
Botosani	CORLATENI	54	68	65	2526	2460	2396
Botosani	CORNI	158	162	182	6689	6716	6734
Botosani	COSULA	55	77	62	3049	3005	2993
Botosani	CRISTESTI	121	151	109	4869	4857	4909
Botosani	CURTESTI	106	166	326	4518	4651	4849
Botosani	DIMACHENI	27	42	29	3152	3086	3023
Botosani	DANGENI	104	115	87	1506	1445	1365
Botosani	FRUMUSICA	166	214	182	6184	6137	5984
Botosani	GORBANESTI	100	121	92	3613	3518	3348
Botosani	LEORDA	158	176	109	2793	2682	2661
Botosani	MIHAI EMINESCU	513	1517	809	6610	6865	7435
Botosani	NICSENI	60	70	42	2858	2821	2680
Botosani	RACHITI	565	681	655	4668	4752	4925
Botosani	ROMA	152	147	185	3337	3370	3415
Botosani	STAUCENI	139	175	170	3408	3449	3504
Botosani	STIUBIENI	71	84	55	2927	2895	2745
Botosani	SULITA	165	179	173	3228	3165	3021
Botosani	TRUSESTI	432	466	395	5816	5769	5599
Botosani	TUDORA	147	150	118	5327	5276	5115
Botosani	UNGURENI	221	192	192	7248	7092	6865
Botosani	UNTENI	67	77	54	3019	2931	2797
Botosani	VACULESTI	65	67	58	2301	2243	2249
Botosani	VARFU CAMPULUI	312	253	128	4018	3867	3724
Botosani	VLADENI	130	149	113	5044	5024	4981
Botosani	VLASINESTI	189	269	252	3407	3328	3105
Botosani	VORNICENI	140	141	77	4601	4454	4306
Botosani	VORONA	355	436	383	8183	8088	7850
TOTAL		**40.322**	**43.955**	**38.171**	**265.587**	**263.237**	**257.764**

Evaluation of functional urban areas (FUA) Iaşi

Table 3

County	UAT Name	Employees 2005	Employees 2008	Employees 2013	Population 2005	Population 2008	Population 2013
Iasi	**IAŞI Municipalities**	114290	128598	108397	307783	306561	321606
Iasi	**PODU ILOAIEI City**	1112	889	531	9902	10264	10704
Iasi	ARONEANU	101	103	86	2870	3044	3578
Iasi	BARNOVA	370	475	376	4098	4540	5893
Iasi	CIUREA	553	368	499	10248	10954	13075
Iasi	COMARNA	109	129	84	4586	4706	4757
Iasi	COSTULENI	139	128	103	4894	4885	4637
Iasi	DOBROVAT	111	88	105	2522	2496	2413
Iasi	DOLHESTI	163	178	102	2957	2950	2800
Iasi	DUMESTI	119	120	105	4691	4741	4811
Iasi	ERBICENI	158	165	133	5718	5789	5796
Iasi	GOLAIESTI	88	95	118	3931	4023	4139
Iasi	GRAJDURI	268	392	256	3089	3190	3297
Iasi	HOLBOCA	1148	993	506	12204	12701	13882
Iasi	HORLESTI	110	125	118	2995	2870	2901
Iasi	IPATELE	66	91	60	2093	2064	1953
Iasi	LETCANI	421	580	521	6576	6866	7318
Iasi	MADIRJAC	84	72	67	1586	1530	1558
Iasi	MIRONEASA	148	158	123	4700	4763	4856
Iasi	MIROSLAVA	1438	1401	2720	8191	9561	13134
Iasi	MOGOSESTI	178	162	144	5182	5342	5390
Iasi	MOVILENI	226	162	86	3200	3205	3128
Iasi	POPESTI	130	135	94	4196	4266	4319
Iasi	POPRICANI	243	350	243	7113	7677	8310
Iasi	PRISACANI	144	115	100	3579	3498	3381
Iasi	PROBOTA	131	107	80	3704	3683	3656
Iasi	REDIU	346	694	127	3710	3955	5573
Iasi	ROMANESTI	68	87	70	1883	1837	1739
Iasi	SCHEIA	131	129	130	4465	4553	4788
Iasi	SCHITU DUCA	162	188	168	3334	3386	3421
Iasi	SCANTEIA	200	195	174	4483	4507	4485
Iasi	TIBANA	174	207	178	7451	7715	7972
Iasi	TIGANASI	427	435	443	4354	4472	4660
Iasi	TOMESTI	456	485	224	12096	12397	13007
Iasi	TUTORA	82	89	68	2001	2053	2030
Iasi	UNGHENI	105	163	137	4126	4285	4451
Iasi	VALEA LUPULUI	300	775	439	3408	4028	5370
Iasi	VICTORIA	257	265	203	4383	4427	4426
Iasi	VOINESTI	201	172	180	6633	6988	7533
TOTAL		**124.957**	**140.063**	**118.298**	**494.935**	**500.772**	**530.747**

Evaluation of functional urban areas (FUA) Piatra Neamţ

Table 4

County	UAT Name	Employees 2005	Employees 2008	Employees 2013	Population 2005	Population 2008	Population 2013
Neamt	**PIATRA NEAMT municipalities**	35756	35868	31168	110288	108229	104595
Neamt	**BICAZ City**	1499	1958	1242	8768	8650	8175
Neamt	**ROZNOV City**	898	940	690	9230	9381	9870
Neamt	AGAPIA	227	258	220	4607	4707	4515
Neamt	ALEXANDRU CEL BUN	990	1076	1007	5278	5467	5898
Neamt	BAHNA	111	132	177	3683	3632	3516
Neamt	BALTATESTI	383	366	398	4475	4362	4212
Neamt	BARGAUANI				4162	4093	3902
Neamt	BODESTI	246	376	247	5188	5160	5047
Neamt	BORLESTI	425	242	255	9561	9531	9484
Neamt	CANDESTI	88	140	130	4319	4266	4085
Neamt	COSTISA	154	175	167	3701	3688	3615
Neamt	CRACAOANI	201	208	255	4598	4594	4552
Neamt	DOBRENI	149	89	140	3641	1726	1734
Neamt	DOCHIA	53	91	76	2518	2671	2843
Neamt	DRAGOMIRESTI	79	122	85	2479	2477	2354
Neamt	DUMBRAVA ROSIE	1883	2076	1864	7331	7782	8153
Neamt	FAUREI	69	63	70	2276	2199	2196
Neamt	GHINDAOANI	40	34	39	4587	4740	4861
Neamt	GARCINA	334	323	262	2225	2220	2069
Neamt	GIROV	625	947	399	5071	5190	5315
Neamt	GRUMAZESTI	268	349	316	5529	5494	5390
Neamt	HANGU	273	209	304	4170	4045	3788
Neamt	ICUSESTI	114	106	106	4694	4636	4597
Neamt	MARGINENI	123	126	134	4162	4113	3941
Neamt	NEGRESTI	24	81	92	0	1991	1965
Neamt	PASTRAVENI	143	152	318	5368	5413	5378
Neamt	PETRICANI	445	406	445	4005	3981	3958
Neamt	PIATRA SOIMULUI	228	294	302	5792	5915	6054
Neamt	PANGARATI	753	840	641	8550	8397	8231
Neamt	PODOLENI	408	314	230	5798	5708	5576
Neamt	RAZBOIENI	77	96	162	2293	2273	2269
Neamt	REDIU	152	186	188	5338	5266	5173
Neamt	ROMANI	121	117	93	4603	4479	4430
Neamt	RUGINOASA	92	63	110	2009	2080	2058
Neamt	SAVINESTI	2470	2508	2835	6575	6644	6621
Neamt	STEFAN CEL MARE	134	216	247	3283	3303	3290
Neamt	TARCAU	877	794	607	3503	3526	3513
Neamt	TASCA	716	621	253	2757	2707	2623
Neamt	TAZLAU	250	248	189	3035	2979	2906
Neamt	TIBUCANI	121	130	132	4601	4475	4317
Neamt	TUPILATI	140	161	125	2364	2315	2252
Neamt	VALEA URSULUI	99	107	83	4103	4174	4380
Neamt	VALENI	33	44	52	1714	1754	1732
Neamt	ZANESTI	294	295	368	6212	6202	6157
TOTAL		**52565**	**53947**	**47223**	**308.444**	**306.635**	**301.590**

Evaluation of functional urban areas (FUA) Suceava

Table 5

County	UAT Name	Employees 2005	Employees 2008	Employees 2013	Population 2005	Population 2008	Population 2013
Suceava	**SUCEAVA municipalities**	44723	49638	43440	106831	107010	105091
Suceava	**FALTICENI municipalities**	6452	5653	4357	30551	30061	29247
Suceava	**CAJVANA City**	255	312	259	8198	8415	8889
Suceava	**LITENI City**	289	383	315	10080	10196	10307
Suceava	**MILISAUTI City**	175	296	230	5398	5377	5391
Suceava	**SALCEA City**	344	421	375	9425	9790	10234
Suceava	ADANCATA	158	254	165	4230	4218	4167
Suceava	ARBORE	176	232	196	7069	7226	7478
Suceava	BAIA	197	276	252	7010	7150	7357
Suceava	BALACEANA	63	62	51	1665	1666	1629
Suceava	BERCHISESTI	35	79	89	0	2861	2908
Suceava	BOSANCI	286	290	246	7023	7047	7324
Suceava	BOTOSANA	147	167	125	2501	2440	2304
Suceava	BUNESTI	100	113	79	2721	2746	2722
Suceava	CACICA	439	450	360	4407	4322	4252
Suceava	CALAFINDESTI	113	187	135	2843	2814	2838
Suceava	CAPU CAMPULUI	85	80	73	2417	2438	2500
Suceava	CIPRIAN PORUMBESCU	95	92	82	2182	2198	2092
Suceava	COMANESTI	77	113	75	2284	2252	2257
Suceava	CORNU LUNCII	496	614	530	7230	7232	7629
Suceava	DARMANESTI	187	248	218	5964	5979	5860
Suceava	DRAGOIESTI	138	109	81	5400	2542	2506
Suceava	DUMBRAVENI	312	271	258	8641	8960	9200
Suceava	FANTANA MARE	80	80	97	2649	2676	2813
Suceava	FANTANELE	118	135	116	4905	4915	4829
Suceava	GRANICESTI	131	173	129	5022	5019	5094
Suceava	HANTESTI	108	107	89	3848	3988	4044
Suceava	HARTOP	81	85	59	2475	2624	2851
Suceava	HORODNICENI	127	189	171	3711	3618	3504
Suceava	IASLOVAT	94	117	124	3542	3676	4025
Suceava	ILISESTI	121	155	108	2749	2718	2800
Suceava	IPOTESTI	258	321	289	5066	5436	6330
Suceava	MITOCU DRAGOMIRNEI	151	227	193	4303	4546	4895
Suceava	MOARA	181	241	213	4466	4656	5114
Suceava	PALTINOASA	264	165	169	5872	5798	5873
Suceava	PATRAUTI	122	117	142	2997	2959	2774
Suceava	PARTESTII DE JOS	206	197	180	4639	4824	5201
Suceava	POIENI-SOLCA	0	58	60	0	2048	2101
Suceava	PREUTESTI	135	152	139	6810	6715	6656
Suceava	RADASENI	89	103	95	4407	4429	4268
Suceava	SATU MARE	96	105	91	4323	4350	4469
Suceava	SCHEIA	904	1393	1200	8101	8722	10344
Suceava	SERBAUTI	77	94	98	3266	3271	3213
Suceava	SIMINICEA	88	99	82	3112	3039	3030
Suceava	STROIESTI	87	106	91	3503	3436	3371
Suceava	TODIRESTI	303	294	241	5934	5908	5821
Suceava	UDESTI	165	182	140	7556	7668	7779
Suceava	VADU MOLDOVEI	176	162	198	3673	3792	4012
Suceava	VERESTI	251	459	400	7294	7257	7283
Suceava	VOLOVAT	84	104	106	4998	5133	5403
Suceava	VULTURESTI	104	119	110	3765	3716	3564
Suceava	ZAMOSTEA	108	96	89	3221	3161	3059
Suceava	ZVORISTEA	148	183	168	6190	6133	6167
TOTAL		**60.199**	**66.358**	**57.378**	**376.467**	**381.171**	**384.869**

Evaluation of functional urban areas (FUA) Vaslui

Table 6

County	UAT Name	Employees 2005	Employees 2008	Employees 2013	Population 2005	Population 2008	Population 2013
Vaslui	**VASLUI Municipalities**	22996	24283	19267	72352	70841	72262
Vaslui	**HUSI Municipalities**	6418	6449	5448	30023	29656	28886
Vaslui	**NEGRESTI City**	2334	2018	1163	10289	10185	10000
Vaslui	ALBESTI	125	135	141	3311	3312	3186
Vaslui	ALEXANDRU VLAHUTA	63	95	94	1570	1492	1313
Vaslui	BALTENI	100	75	140	1572	1593	1525
Vaslui	BOGDANA	42	82	80	1827	1838	1714
Vaslui	BOGDANESTI	64	88	121	3547	3464	3378
Vaslui	BOGDANITA	43	70	72	1583	1561	1527
Vaslui	BOTESTI	57	84	79	2244	2188	2079
Vaslui	BUNESTI-AVERESTI	132	125	110	2948	2841	2602
Vaslui	CODAESTI	163	157	155	4886	4792	4597
Vaslui	COSTESTI	133	142	157	3287	3202	3126
Vaslui	COZMESTI	55	75	81	2489	2490	2471
Vaslui	CRETESTI	65	86	97	1824	1812	1838
Vaslui	DANESTI	55	75	100	2375	2304	2144
Vaslui	DELENI	77	95	91	2549	2514	2427
Vaslui	DELESTI	81	95	89	2617	2569	2319
Vaslui	DRAGOMIRESTI	127	146	168	4975	5044	5032
Vaslui	DUDA-EPURENI	88	112	121	5002	4886	4637
Vaslui	FERESTI	52	75	81	2174	2196	2183
Vaslui	GHERGHESTI	66	103	111	2838	2827	2775
Vaslui	HOCENI	69	99	110	3163	3057	2870
Vaslui	IANA	85	145	120	4154	4227	4148
Vaslui	IBANESTI	37	56	76	1471	1573	1539
Vaslui	IVANESTI	157	143	160	4991	4838	4572
Vaslui	LAZA	126	126	148	3293	3315	3109
Vaslui	LIPOVAT	119	157	176	4345	4360	4373
Vaslui	MICLESTI	75	96	101	2928	2937	2755
Vaslui	MUNTENII DE JOS	96	219	222	3812	3931	4132
Vaslui	MUNTENII DE SUS	98	112	113	3857	3940	4225
Vaslui	OLTENESTI	86	133	153	2988	2914	2767
Vaslui	OSESTI	72	99	109	3229	3288	3249
Vaslui	POIENESTI	65	97	103	3206	3201	3169
Vaslui	PUIESTI	155	172	177	4909	4907	4813
Vaslui	PUNGESTI	116	123	117	3522	3450	3365
Vaslui	PUSCASI	60	87	103	3524	3631	3865
Vaslui	REBRICEA	84	121	121	3719	3811	3768
Vaslui	ROSIESTI	122	97	194	3654	3621	3369
Vaslui	SOLESTI	82	99	115	3957	3938	3810
Vaslui	STEFAN CEL MARE	91	107	125	3366	3469	3468
Vaslui	TACUTA	87	109	118	3445	3404	3317
Vaslui	TANACU	79	75	94	2375	2313	2006
Vaslui	TATARANI	66	83	94	2579	2460	2296
Vaslui	VALENI	169	349	118	4757	4721	4717
Vaslui	VOINESTI	83	109	120	3959	3970	3943
Vaslui	VULTURESTI	77	130	117	2396	2435	2329
Vaslui	ZAPODENI	105	114	202	4130	4109	4003
TOTAL		**35.797**	**37.922**	**31.372**	**258.011**	**255.427**	**251.998**