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CHARACTERISTICS OF DEMOGRAPHICAL DYNAMICS IN AREAS OF URBAN INFLUENCE. CASE STUDY: INFLUENCE AREA OF RÂMNICU VÂLCEA CITY

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Abstract: The article captures the main characteristics of the demographic dynamics in the influence area of Râmnicu Vâlcea city, between 1985 and 2007. In this respect, we analyzed the evolution in numbers of the population in the area of influence in the respective period, as well as a set of indicators such as birth rates, mortality rate, natural increase and the vitality index in order to identify the changes of quantitative and qualitative nature that influenced the mass of population in the area of influence during the period analyzed.

Keywords: population, evolution in numbers, birth rate, mortality rate, natural balance, vitality index.

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INTRODUCTION

In geographical terms, the city is the most complex system at work in a territory. No matter its size, as a result of its polarizing capacity, the city exerts its influence on the surrounding space (Ungureanu and Ţurcănaşu, 2008). Furthermore, the city is considered *„an optimal, open, thermodynamic and informational system"* (Ianoş, 2004, p. 4), a system that develops and survives thanks to the multitude of relationships it establishes with the other, neighboring systems in the

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territory. All these ties the city establishes with the surrounding space, ties which indicate a mutual dependence, eventually shape the area of influence of the respective urban center. This allows us to assert that the area of influence of a city is the primordial element in identifying and individualizing the main systems of localities (Ianoş, 1987). At the territorial level, this complex system is grounded in two sub-systems: the city itself and its area of influence. Both components are closely bound, by way of a multitude of relations, generated especially by the city, a major consumer of resources (Pintilii et al., 2008; Drăghici et al., 2009). This is an explainable situation, as the city is in a state of constant development, and it practically obtains most of the resources it needs from its area of influence (Ianoş, 1987; Negoescu, 1998; Mănescu, 1999; Istrate, 2008; Peptenatu et al., 2010a; Peptenatu et al., 2010b).

In this context the analysis of the relations established between the city and its area of influence becomes an important stage in understanding the transformations that impacted on the urban settlement, and especially the way it will evolve in the coming period. Among the multitude of ties, demographic ties are very complex, which can be explained by the force of the attraction the polarizing city exerts, especially on the workforce.

The changes of a socio-economic nature that have influenced Romania of late have left their imprint on demographic dynamics, too, especially in the case of cities and indirectly on the cities' areas of influence (Istrate, 2008). In general, population dynamics are linked to the population's natural movement and mobility in the territory, as they are among the main elements that convey a big picture of the way a city's area of influence has evolved in terms of demographics (Stașac and Stupariu, 2010). The main factors that influenced, in time, the number of inhabitants in a certain area of influence are the birth rate and mortality rate, as well as population exchanges between the area of influence analyzed and outer regions.

Population is the most active component in the dynamics of an area of influence, and in this respect the analysis of the dynamics of the population can be deemed an important stage in the study of areas of urban influence, and especially in territory planning and implementing a viable social policy (Cicharska, 2011).

METHODS

The analysis of the dynamics of population was conducted to encompass the entire area of influence, at city and commune level. Statistical data were processed and investigated, obtaining graphical and cartographical representations of various indicators that were used in the detailed analysis of the studied area. In order to ensure the accuracy of the representations, the statistical data used come from both population censuses (1912 - 2002) and annual series for the time from 1985 to 2007. Also the influence area of Râmnicu Vâlcea city has been established by overlapping three areas of influence, previously obtained (influence of health area, influence of cultural and educational area and the influence of transportation area) at a time resulting in a likely area of influence. The result is an asymetric expansion space, totaling a number of 33 localities (37% of total number existing settlements in the country) and with a population of 129.325 people (about 31% of the total number of country residents) (Drăghici et al., 2009).

RESULTS

Numerical evolution of the population

The most general indicator used in the description of a certain population refers to its size or numbers. In order to ensure a strict delimitation of human communities, the size of the population is always associated with the categories of space and time.

The evolution in numbers of the total population of the area of influence features an upward course, in general, but with certain fluctuations, a situation that allows a division into two distinct stages: 1912 - 1977 and 1977 - 2007 (figure 1).

The 1912 - 1977 stage registered a net increase of 39,046 inhabitants, with the exception of the 1941 - 1948 time period, when there was a drop in the number of inhabitants.

The 1948 - 1956 period saw the total number of inhabitants increase by 7,047, resulting in a positive total growth rate of 5.76%. Thus, 9 of the localities inside the area of influence register total growth rate values of more than 10% (among them, 5 feature total growth rates of more than 15%: Băile Govora - 27.30%, Băbeni - 22.15%, Voineasa - 19.26%, Băile Olăneşti - 18.06%, Călimăneşti - 16.13%).

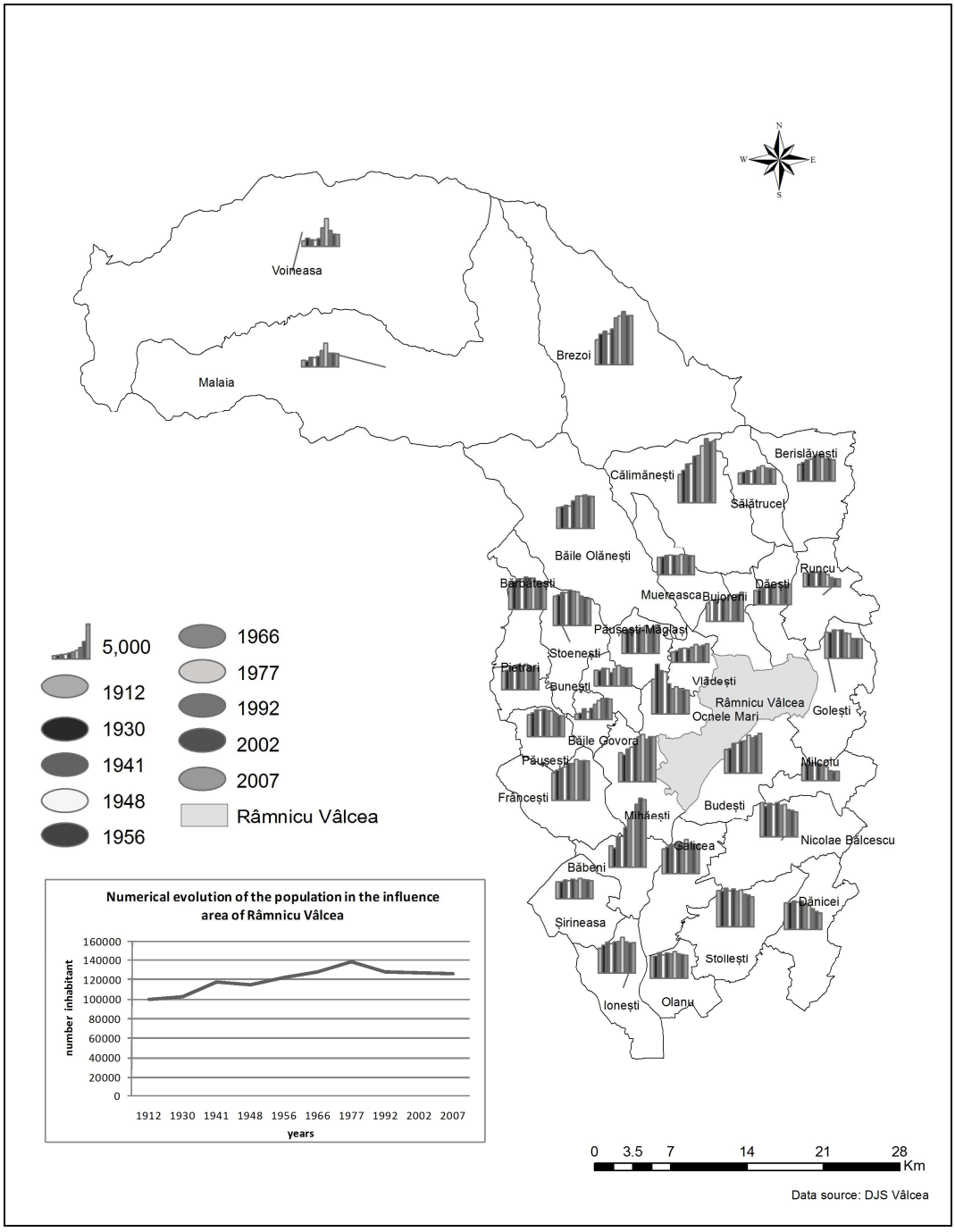

Figure 1. Numerical evolution of the population (1912 - 2007)

During this period, 5 localities stand out as they register negative values of the total growth rate, 2 of them registering very high values for that indicator: Ocnele Mari (-39.34%) and Buneşti (-29.33%).

The 1956 - 1966 period meant an increase in population numbers from 122,255 to 128,077, which meant a net growth of 5,822 inhabitants, or a total growth rate of 4.55%. The emergence of large industrial facilities in the area, as well as the attraction of certain urban centers, caused the depopulation of certain rural settlements, while on the other hand the city of Râmnicu Vâlcea becomes an important hub of attraction in the area. 5 localities stand out with positive growth rates of more than 20%: Voineasa (58.14%), Malaia (27.36%), Brezoi (23.44%), Buneşti (22.29%). However, the number of localities with positive growth rates is 18, or more than 50% of the total of administrative units analyzed. Drops in the number of inhabitants are registered in 15 localities, drops reflected in the value of the total growth rate to negative values. Among them, 3 localities stand out, with steep drops in the population: Ocnele Mari (-21.06%), Milcoiu (-14.57%) and Goleşti (-12.34%).

The 1966 - 1977 period registered a total growth rate of 7.61%, meaning an increase in the number of inhabitants by 10,549. During this period 8 localities (Runcu, Milcoiu, Dănicei, Goleşti, Stoeneşti, Berislăveşti, Păuşeşti and Bărbăteşti) are those that register negative values of the total growth rate. The commune of Runcu stands out among them, there the value of the total negative growth rate is the highest, -14.74%. The other localities register positive values of the total growth rate, and several situations can be discerned:

- steep positive evolution, with outstanding values, characteristic of 9 localities (values exceeding 500 inhabitants). 3 localities stand out: Călimăneşti (1,360 inhabitants), Voineasa (1,325 inhabitants) and Malaia (1,067 inhabitants);
- moderate positive evolution, with values ranging between 200 and 500 inhabitants, in 11 localities: Buneşti, Vlădeşti, Mihăeşti, Olanu, Brezoi, Păuşeşti - Măglaşi and others.
- low positive evolution, with less than 200 inhabitants: Sălătrucel, Muereasca, Stoileşti, Nicolae Bălcescu, Băile Olăneşti.

The 1977 - 2007 stage meant a drop in the number of inhabitants in the area of influence from 138,626 people to 125,621 people (13,005 inhabitants). The main cause of this outstanding negative evolution was the migration of the population, both domestic and abroad, caused by the socio-economic conditions brought about by the post - 1990 changes.

The 1977 - 1992 period registered a negative total growth rate of -8.14%, the lowest rate in the post - 1977 stage. Only 5 localities register positive values: the towns of Băbeni -13.14%, Călimăneşti -11.35%, Băile Govora -9.06%, Băile Olăneşti -2.78% and Brezoi -8.48%. The exception is the town of Ocnele Mari, where the total growth rate is negative (-7.35%), a situation mainly due to its proximity to the most important polarizing city, that is the city of Râmnicu Vâlcea. In the other 17 localities the total growth rate registers negative values, with the highest value found in the commune of Voineasa (-75.92%). Other localities with high negative values are: Malaia (-73.55%), Milcoiu (-36.86%), Runcu (-31.51%), and Goleşti (-23.69%). This steep drop has several causes:

- first of all the drop in economic activity as a result of certain production facilities closing down after 1990, but also as the result of the completion of work on certain economic assets (the hydrotechnical work on the Olt and Lotru rivers);
- the high degree of isolation of certain localities, which brought about the migration of the young population to towns in the near vicinity or to the polarizing hub;
- the change in the status of certain localities from rural into urban areas, which resulted in an increased attractiveness for the population in the neighboring localities;
- the little-developed infrastructure at commune level, which caused the migration of the population to urban settlements with a superior level of social infrastructure.

The 1992 - 2002 period is characterized by the continued downtrend but with a lower intensity than in the previous period (-1.33%), with the observation that the trend is reversed in the

case of the towns. In the case of the towns this drop can be explained by the reorganization that encompassed industrial units inside the towns, with the aftermath of the loss of jobs and the population's return to their home communities. At an individual scale, the situation is as follows:

- 8 localities registered positive growth rates, with the highest being those registered in the localities: Bujoreni - 10.86%, Băbeni - 8.35%, Dăeşti - 8.04%. Mention should be made that these growth rates are mainly registered by the rural localities in the first ring of settlements around the city of Râmnicu Vâlcea;

- 25 townships posted negative growth rates, with the most massive depopulation registered in the commune of Voineasa where the value stood at -30.50%.

The 2002 - 2007 period is characterizes by a trend towards a drop in the population, but the value is smaller than during the previous period, i.e. -0.71%. The following matters can be highlighted:

- 8 localities register positive values of the total growth rate, 5 of them having registered positive values in the preceding period as well. The steepest growth rates are registered in the localities Bujoreni, Vlădeşti, Păuşeşti-Măglaşi, Budeşti and Dăeşti;

- the other 25 units registered negative values of the total growth rate, with the highest value registered by Dănicei (-7.25%).

Birth rates

The analysis of this geo-demographic variable was meant to highlight the intensity of birth rates across environments (urban-rural) and across the territory with the goal of identifying the trends of future evolution of the localities inside the area of influence of the city of Râmnicu Vâlcea.

The average birth rate during the 1985 - 2007 period fluctuated between a minimum of 8.61‰ in the commune of Milcoiu and a maximum of 14.29‰ registered in the commune of Muereasca. The highest values of the average birth rate, above 12.7‰, are registered in 7 localities, more exactly: Brezoi, Sălătrucel, Berislăveşti, Muereasca, Bujoreni, Frâncești and Stoileşti. For the overall area, the birth rate values ranged from a maximum of 16.6‰ in 1987 to a minimum of 8.4‰ in 2007 (table 1).

The outstanding growth during the 1985 – 1987 period was due to the legislation passed by the Romanian state in the field of demographic policies. Furthermore, in 1987 the birth rate in 15 localities registered very high rates, which exceeded the average rate of that year, 16.6‰. Among them, stand out the localities of Sălătrucel - 23.9‰, Brezoi - 22.6‰, Muereasca - 20.8‰, Milcoiu - 20.8‰. The trend continued on into next year, 1988, when the average birth rate in the area of influence of the city of Râmnicu Vâlcea stood at 16.38‰.

Furthermore, those two years saw the highest number of live births in the entire time period analyzed: 2,169 in 1987 and 2,133 in 1988. The next year the birth rate dropped slightly, but it remained at a high value - 16.23‰.

The post - 1990 socio-economic changes left their mark on the demographic behavior of inhabitants of the area of influence of the city of Râmnicu Vâlcea. Practically, starting 1990 and through to 2007, the drop was a constant one, with a slight rise in 1997 and 2005. Subsequently, by 2007, 21 localities register values below the mean average of the area of influence. Among them, the commune of Dănicei stands out, with the lowest value, 3.4‰ (other localities with low values are: Şirineasa - 5.4‰, Runcu - 5.4‰, Goleşti - 5.5‰ and Galicea - 5.8‰).

Mortality rate

Socio-economic factors have a special importance in determining the evolution of mortality rate. The ever-rising level of economic development led to an improvement of living conditions of the population, which meant improved diets, improved healthcare services; if one adds shorter working hours and higher wages, all these factors contributed to the drop of mortality rate. The average value of the mortality rate in the area of influence of the city of Râmnicu Vâlcea during 1985

- 2007 remained between 12‰ - 14‰, with a peak in 1997, with 14.91‰ (values exceeding 14‰ were also registered in 1996 - 14.34‰ and in 1998 - 14.63‰), and a low in 1986, 11.65‰ (table 1).

If one analyzes the situation across the two environments - urban and rural - one can notice that the population in the urban environment registered the lowest values of the average mortality rate, below the annual average rate of the area of influence, values that endured throughout the time analyzed. Furthermore, by 2007, 4 of the towns registered a mortality rate below 10‰, a value below the mean average of the entire zone that year - 11.92‰. This situation can be explained by means of the higher ratio of young and adult groups of the total population.

In exchange, in the case of localities in the rural sector the mortality rate values were higher, above the annual mean average registered throughout the time period. As a supporting argument, one can mention that in the time period analyzed 22 localities registered mortality rate values above 13‰, 21 of them communes (the exception is the town of Ocnele Mari), and 6 of them actually exceed 16‰ (Milcoiu - 19.65‰, Runcu - 18.99‰, Dănicei - 17.96‰, Goleşti - 16.24‰, Stoeneşti - 16.05‰).

Table 1. The average birth and mortality rate in the influence area of Râmnicu Vâlcea for 1985 and 2007
(Source data: calculated data)

Nr. Crt.	Localitate	Average birth rate (1985 - 2007)	Average mortality rate (1985 - 2007)
1	BĂBENI	12,11	9,08
2	BĂILE GOVORA	8,95	10,30
3	BĂILE OLĂNEŞTI	12,69	11,49
4	BREZOI	13,63	9,68
5	CĂLIMĂNEŞTI	12,02	11,83
6	OCNELE MARI	11,60	13,20
7	BĂRBĂTEŞTI	9,62	15,77
8	BERISLĂVEŞTI	13,75	12,92
9	BUDEŞTI	11,61	12,06
10	BUJORENI	14,03	13,09
11	BUNEŞTI	12,66	13,42
12	DĂEŞTI	12,44	13,08
13	DĂNICEI	10,86	17,96
14	FRÂNCEŞTI	13,39	13,32
15	GALICEA	11,48	13,55
16	GOLEŞTI	10,77	16,24
17	IONEŞTI	11,03	14,52
18	MALAIA	11,98	9,40
19	MIHAEŞTI	10,91	13,89
20	MILCOIU	8,61	19,65
21	MUEREASCA	14,29	13,47
22	NICOLAE BĂLCESCU	12,13	13,97
23	OLANU	10,52	14,56
24	PĂUŞEŞTI	10,34	14,17
25	PĂUŞEŞTI –MĂGLAŞI	11,35	14,08
26	PIETRARI	10,52	14,94
27	RUNCU	10,95	18,99
28	SĂLĂTRUCEL	14,10	11,97
29	ŞIRINEASA	11,08	13,90
30	STOENEŞTI	10,21	16,05
31	STOILEŞTI	13,01	13,95
32	VLĂDEŞTI	12,28	12,31
33	VOINEASA	9,82	7,56

Natural balance (natural increase)

The evolution of the natural balance in the time analyzed follows, in general, the same course as the evolution of birth and mortality rates. Positive values of the natural increase rate are observed for the first six years (1985 - 1991), with a first peak registered in 1986 and 1987, 4.59‰ and 4.15‰, respectively, and a second peak, of smaller magnitude, in 1989 - 4.07‰. The lowest values in the entire region are regularly found after 1993, although negative values were observed as early as 1991 (-0.04‰). This drop occurred in the context of the constant drop of the birth rate and the mortality rate remaining at relatively the same levels.

By 1986, 29 localities registered positive natural balance values and only 4 of them registered negative values of that indicator (figura 2). However, out of the 29 localities, only 13 administrative units posted values that topped the mean average of the area of influence, 4.59‰. In the latter group, values above 9‰ were registered in the localities: Sălătrucel - 12.58‰, Budeşti – 10.93‰, Stoileşti - 9.71‰, Galice - 9.36‰, Băile Govora - 9.23‰, Brezoi - 9.12‰ and Muereasca - 9.01‰. Negative values were registered only in 4 localities: Runcu (-8.15‰), Milcoiu (-4.85‰), Bărbăteşti (-1.62‰) and Pietrari (-0.82‰).

By 2007 the situation had reversed, so that there were 27 localities that registered negative values and only 6 localities where the natural balance was positive. Therefore, there were 20 localities that featured rates above the -3.51‰ mean average, and 4 of them featured values above -10‰: Păuşeşti-Măglaşi (-13‰), Dănicei (-16.25‰), Bărbăteşti (-11.42‰), Milcoiu (-10.50‰).

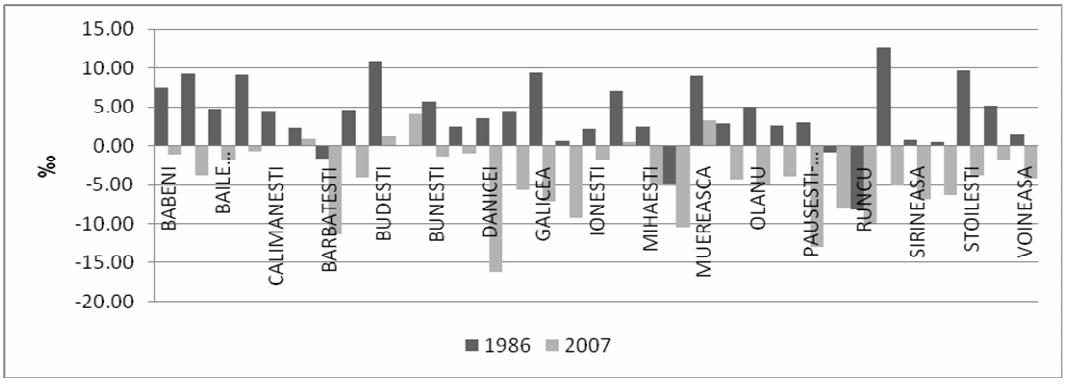

Figure 2. Natural balance in the influence area of Râmnicu Vâlcea for 1986 and 2007
(Source: calculated data)

The 6 localities with positive natural balance values were: Muereasca - 3.23‰, Malaia - 0.52‰, Bujoreni - 4.01‰, Budeşti - 1.23‰, Călimăneşti - 0.11‰ and Ocnele Mari - 0.86‰. These very low values of the natural increase rate can be explained by the drop in the birth rate and the mortality rate remaining at a relatively constant value. There are also localities where the ratio of people aged 60 and over is high. This situation is due on the one hand to the low birth rate and on the other hand to the shrinking young population group, as a result of migration to localities where economic outlooks are positive.

The vitality index

Information on this index allows one to issue forecasts on the evolution in number of the population, as well as the structure in terms of age groups. The mean average value for the entire area of influence of the city of Râmnicu Vâlcea was 91%, with an 85% value for the rural environment and 115% for the urban environment. During the time period analyzed, one can notice an increase of that index up to 1986, when it reaches a peak at 138% (figure 3). The next period stands out with a drop of that index to 71% by 2007, and thereafter the index value fluctuated from 65% to 71%, with an uptrend in the last year.

The evolution of the birth rate follows the same general trend in the two environments, urban and rural, with the mention that while in the case of rural localities the downtrend continues after 2001 (from 68% to 64% by 2007), localities in the urban environment register a slight increase in the value of that index (from 83% to 91% by 2007).

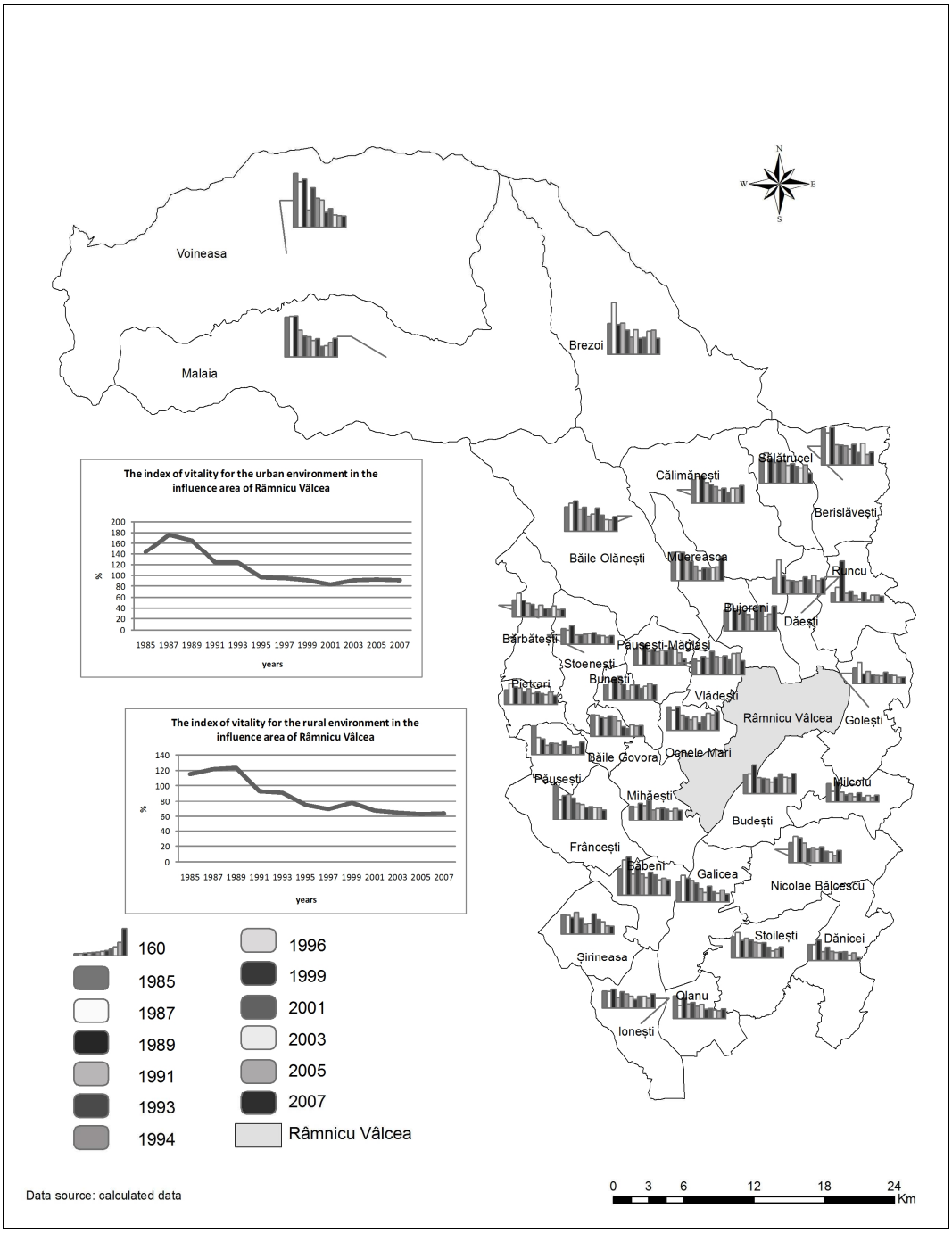

Figure 3. Vitality index (1985 - 2007)

Evolution across the territory, by 1985, indicates that three communes - Voineasa, Berislăveşti and Malaia - feature values exceeding 200% (Voineasa - 311%), 18 localities feature vitality index values ranging from 100% to 200% (this category includes the 6 towns in the area of influence) and 12 localities with values below 100% (Runcu - 56%, Pietrari - 83%).

By 2007, the situation is completely different from the situation early in the time analyzed, so that there are no more localities where that index would exceed 200%, and there are only 6 localities with values exceeding 100%, more exactly 2 towns (Călimăneşti - 101% and Ocnele Mari - 107%) and 4 communes (Budeşti - 115%, Bujoreni - 144%, Muereasca - 139% and Malaia - 108%). The other localities register values below 100%, and some actually below 50% (Dănicei - 17%, Păuşeşti-Măglaşi - 33%, Runcu - 35%, Goleşti - 38%, Milcoiu - 39% and Şirineasa - 44%).

CONCLUSIONS / DISCUSSION

To conclude, one can remark that in the time period analyzed, the number of inhabitants in the area of influence posted an overall increase (26,041 inhabitants). Furthermore, the peak was reached in the 1980s, when a very high birth rate was also registered (16.6‰ in 1987) as a consequence of the pro-birth policy adopted by the Romanian state at that time. However, starting 1990, there has been an obvious downtrend as far as the number of inhabitants in the entire area is concerned.

This drop is grounded in the socio-economic transformations of society at this time, transformations that inevitably influence the area of influence of the city of Râmnicu Vâlcea (Mălăescu, 2009). There is the additional factor of migration abroad in search of better jobs (Staşac and Stupariu, 2010). The extant situation as far as the post - 1990 number of inhabitants is concerned is reflected by the very low values of the natural increase rate, as the result of the drop of the birth rate and the relatively constant mortality rate at this time. In addition, the vitality index values for the time period analyzed, but especially for 2007, indicate a downtrend for the number of inhabitants in the area of influence of the city of Râmnicu Vâlcea as a result of the very low birth rate.

One solution that would temper the drop in the number of inhabitants could be the development inside the area of influence of those complementary branches of the economy that would be capable of ensuring a sustainable development, so that that development would eventually be reflected at the individual level. This thing can only be achieved by creating a multiple-center network that would practically ensure a more efficient distribution of the development, at both zonal and especially regional scale (Ianoş et al. 2009, Peptenatu et al., 2009, Peptenatu et al., 2010; Humeau et al., 2010).

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