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The development of education in the rural areas in the post economic crisis period. Case Study: Argeş county, Romania

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Abstract

Education is the main pillar of any society, both worldwide and in Romania. The paper analyzes the evolution of the educational system in the rural areas from the county of Argeș during the crisis period and also after the financial crisis. The study has been based on statistical evidence data and also on the data provided by the Ministry of Regional Development, European Funds and Public Administration. The analysis has been applied on 95 communes, which form rural area in the county of Argeș. In addition to the educational variables, the study also took into account social and economic indicators in order to obtain a greater veracity over the analysis. In the methodological approach the article uses the principal components analysis and the hierarchical ascendant classification analysis, taking into consideration the year of 2010 and the year of 2016. The analysis points to the fact that the villages close to Pitesti stands out, as these are more developed. They are followed closely by the category represented by the villages with an aging population, from where the majority of the young workforce has emigrated. Another category is represented by the villages which have their economy based on the primary sector, and the last category is the one containing the villages with a disadvantaged ethnic population.

Keywords: *education in the rural areas, school population, principal component analysis, hierarchical ascendant classification, Argeș county*

Rezumat. Dezvoltarea educației în perioada post-criză economică în zonele rurale. Studiu de caz: județul Argeș, România

Dezvoltarea educației în perioada post-criză economică în zonele rurale. Studiu de caz: județul Argeș, România. Educația, atât în lume cât și în România, reprezintă pilonul de bază al oricărei societăți. În acest articol se evidențiază modul de evoluție al sistemului educativ în zonele rurale din cadrul județului Argeș în perioada de criză și post criză financiară. Studiul s-a bazat pe date de evidență statistică, dar și din datele Ministerului Dezvoltării Regionale, Administrației Publice și Fondurilor Europene. Analiza se aplică la nivelul a 95 de unități rurale de la nivelul județului Argeș. Pe lângă variabilele educaționale, s-au luat în considerare și indicatori sociali și economici pentru a oferi o mai mare veridicitate anlizei. În demersul metodologic articolul recurge la analiza în componente principale și clasificării ierarhice ascendentă fiind analizată la nivelul anului 2010 și 2016. În cadrul rezultatelor obținute se remarcă tipologia specifică educației din comunele din proximitatea municipiului Pitești cu o dezvoltatare ridicată, urmată de categoria comunelor cu o populație foarte îmbătrânită de unde a migrat majoritatea forței de muncă tinere. O altă categorie este reprezentată de comunele în care predomină sectorul primar, iar o ultimă categorie este cea a comunelor cu populație etnică dezavantajată.

Cuvinte-cheie: *educația în zonele rurale, populația școlară, analiza în componente principale, clasificarea ierarhică ascendentă, județul Argeș*

Introduction

The central theme of this paper shows the main challenges we encounter and which the educational system is confronting with in the rural areas. Thereby, through keeping education at the high quality level, the society can answer fast to the sudden modifications in the local development (Smit & Wandel, 2006). Education, a constructive factor in any society (Borys, 2010), has in mind finding a solution to major problems, being considered the most sustainable method of dealing with the current challenges, among which the impact the society has over the environment is the most important one (Bühler et al., 2013; Mugi-Ngenga et al. 2016).

Out of the most challenging issues societies in the Eastern European countries are facing, education stands out through a drastic decrease in the school population (Pickup & White, 2003) and in the GDP share attributed to education. The foundation of these problems is representative for transition economies, which have known an ideological change, because, together with the economic decline, they have faced serious issues from a social point of view as well. The rural areas are more susceptible to changes in the socio-economic structure. There have been excessive migrations of the workforce to European countries, phenomena which has been amplified by the economic crisis in 2008 that has led the young population wanting to migrate to urban areas (Gatarić et al., 2016). At the same time, the educational system in the rural areas has had some downward dynamics in what is related to the quality

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of education, aspect underlined by the number of the teaching staff or by the school population.

The main idea in this article is the necessity to observe the challenges the rural areas were facing in the post-crisis period. These challenges concern both educational components and socio-economic aspects, aimed at society's development (Lukic et al., 2016).

Method

In our study we used advanced statistical methods as principal component analysis (P.C.A.) and hierarchical ascendant classification (H.A.C.) (Henning et al., 2011; Șerban & Ianoș, 2014) in order to organize the rural villages in the county of Argeș and in order to analyze the specificities of the main components resulted from the educational system when correlated with socio-economical aspects.

For the statistical analysis of the educational system, we used four indicators: school population, school laboratories, teaching staff, classrooms; apart from that, we can add two economic indicators: expenses for education in the local budget and the number of employees, but also two social indicators: the number of households and the number of unemployed persons.

Through our analysis, we have identified the degree of correlation between the indicators taken into consideration and also casualty issues which prove the functional mode of the socio-educational system. The methods that have been used were analyzed with the aid of Philcarto.

As mentioned above, the analysis comprises two different stages after the 2008 crisis period, 2010 and 2016 (except the number of employees - 2015). The period is determined by data availability. At the same time, the problem of education needs was analyzed across the entire post-socialist period (Stanilov, 2007), when the Romanian socio-economic system is evolving (Șerban & Ianoș, 2014). In this regard, we have used the percentage of the school population from the total population in the entire period of time between 1991-2016 in the county of Argeș.

Results

The analysis of the entire post-socialist period indicated the existence of three great significant periods in the evolution of the school population (Figure 1): the first one is comprised between 1992-2000 and it has been dominated by school population values of about 20%, which was due to the birth stimulating politics imposed by Nicolae Ceaușescu. The second one (2000-2008) overlaps the period of economic growth, but also a certain regress for the school population mainly due to the opening borders to the European Union and to the demographic "gap" in the 1990's (Nancu et al., 2011). The third one (2008-2016) coincides with the financial crisis period, continuing through a mass exodus of the young population, who chose to leave to foreign countries (Oberhauser, 2016).

Based on the dynamics of the share of population aged between 20-39 years old in the county of Argeș, between 1992 and 2016, but also based on the rural population with the same characteristics, we will be able to prove some interesting facts. One can notice (Figure 2) that the dynamics of the rural population aged between 20-39 years old is divided by two different trends: the first one (1992-2007) shows an ascending trend, while after 2007 it fell below 30%. The reasons for these phenomena can be explained through a high migration rate of the young population to the urban areas to cities with better economies (e.g. Bucharest, Brașov or Sibiu), and also through the specifics of the age categories we encounter in the rural areas from the vicinity of the major towns in the county (Miletić et al., 2011).

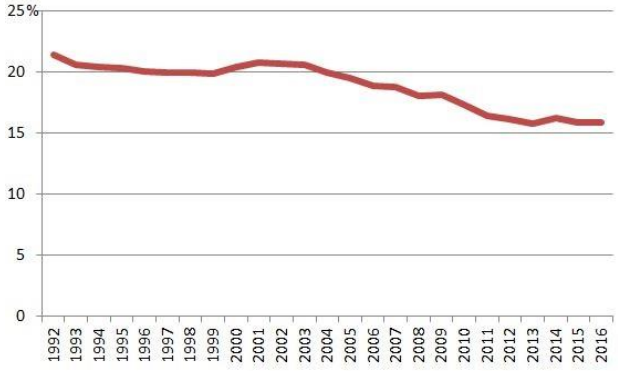

Fig. 1: The evolution of the school population share between 1992-2016 in county of Argeș

Source: National Institute of Statistics

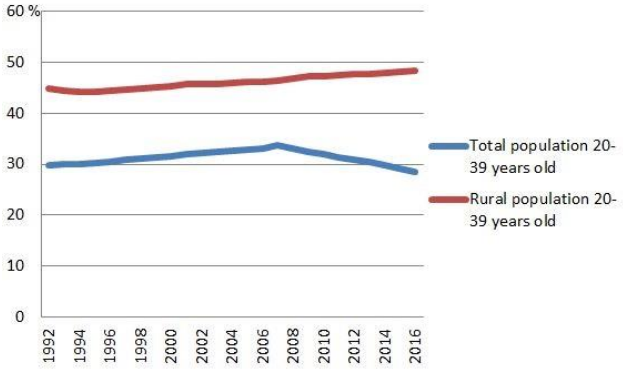

Fig. 2 The evolution of the population ratio with ages between 20-39 and the evolution of the rural population with ages between 20-39 in the period between 1992-2016, in the county of Argeș

Source: National Institute of Statistics

Continuing the analysis on the same path, by comparing the total gross variables for the indicators that were used in the principal component analysis and in the hierarchical ascendant classification for the time between 2010 and 2016, the following percentage values are highlighted: a drop of -14.93% in the school population, a drop of -5.32% in the number of labs, a drop of -18.10% in the teaching staff, and an increase of 38.71% of the local budget expenses in education. We can state that the main problems in the two years which have been analyzed are represented by the decline in the number of the school population and of the teaching staff. Given the fact that the young population has migrated (Sagynbekova, 2016), the number of pupils for each form of education has dropped considerably (because of the number of teachers who do not want to teach in rural areas (Ankrah-Dove, 1982), because of resignations and because of a poor wage motivation).

The higher figures for the investments are the result of a constant financial growth for the Romanian economy, which is confirmed by a 31.54% growth in the number of employees and also by a decrease of the unemployed by -18.82%. The social category represented by the number of households records an increase of 3.17% given the cultural perceptions of the Romanian people. Therefore, based on the above-mentioned factors, we can better understand the direction of the educational development in the rural areas in the county of Argeș.

In terms of the principal components analysis, we can see how in the year of 2010 the value of the first principal component is 67.74%, while in 2016 the value for the same component is 64.8%, aspect which is sustained by the Pearson coefficient (Fig. 3, Fig. 4), which shows that not all the indicators can be correlated because they express different social phenomena or contrary aspects (it is very unlikely for the number of employees to grow, when the number of unemployed grows). The variables that are expressed through the first principal component are represented in both analyses by: school population, teaching staff, number of classrooms, local budget expenses for education and the households, while the variables expressed through components 1 and 2 are represented by the number of employees, whereas the ones expressed through components 1 and 3 are represented by the number of laboratories. An interesting aspect to notice is the number of unemployed in 2010, which was at first represented by components 1 and 3, and then by component 2, aspect which is given by the dramatic decline in the number of unemployed (2401 persons).

The observation of the villages' general characteristics from an educational point of view, has been done through HAC, with 5 different classes, so as to highlight the socio-educational evolution for the villages under discussion, based on the standard deviations.

For each of the 5 classes there is a denomination, based on the category's characteristics. Thereby, 4 of these appear at the level of both the analyses and one of them disappears, being completely replaced by a new class.

We call the first class for the year of 2010 the category of settlements with a high level of education and which is characterized through low values for the number of unemployed, due to proximity to the county seat Pitesti. Because of this, some companies have decided to move their headquarters there. This aspect is strengthened by the expenses in education, which occurred because of big number of employees. As for the educational variables' values, they are positive because, having many employees and also taking into account the way the villages are positioned, there comes a great possibility to have children and also to have teachers willing to teach.

	The Inertia Matrix (*1000) . Coefficients of Pearson linear correlation							
	V01	V02	V03	V04	V05	V06	V07	V08
V01 School population 2010	1000	545	769	944	488	865	587	908
V02 Laboratories 2010	545	1000	444	611	283	585	248	539
V03 Households 2010	769	444	1000	781	550	748	421	783
V04 Teaching staff 2010	944	611	781	1000	417	892	573	889
V05 Employees 2010	488	283	550	417	1000	379	244	637
V06 Classrooms 2010	865	585	748	892	379	1000	497	830
V07 Unemployed 2010	587	248	421	573	244	497	1000	547
V08 Expenses in the local budget dedicated to education 2010	908	539	783	889	637	830	547	1000

Fig. 3 The Inertia Matrix for the year of 2010

	The Inertia Matrix (*1000) . Coefficients of Pearson linear correlation							
	V01	V02	V03	V04	V05	V06	V07	V08
V01 School population 2016	1000	563	745	946	438	895	376	927
V02 Laboratories 2016	563	1000	383	595	288	612	49	566
V03 Households 2016	745	383	1000	724	592	716	167	800
V04 Teaching staff 2016	946	595	724	1000	409	924	320	919
V05 Employees 2015	438	288	592	409	1000	377	-99	649
V06 Classrooms 2016	895	612	716	924	377	1000	302	875
V07 Unemployed 2016	376	49	167	320	-99	302	1000	244
V08 Expenses in the local budget dedicated to education 2016	927	566	800	919	649	875	244	1000

Fig. 4 Fig. 4 The Inertia Matrix for the year of 2016

An interesting fact is that the population in these villages has also high values for the school population and this is because of the local population's educational profile, when compared to the one in the cities.

We need to notice that we encounter the same category in the year of 2016. Modifications in this group are based on a larger population and on a much more developed school infrastructure, but we also encounter a bigger number of unemployed when compared to 2010. This development has been based on a high evolution of the social system, represented by the excessive migration to the suburbs and, consequently, the local economy did not have the same rhythm as the number of newcomers (a growth in population of 9.1% between 2010-2016).

In 2010, the second category is made up by localities which have all the values negative, being the most consistent category but also the most negative one from an educational point of view. The main aspect is given by the specificities of these localities with an aging population, whose children went to areas with a better possibility of economic stimulation (Scholich, 2007). One can say, based on the variable of the unemployed, which is very low, that the economy of these localities is based on elements belonging to the primary sector and that the only solution to this failure of capitalism is to sustain the poor rural population (Lipton ,1977). This category corresponds to the third class analyzing the year of 2016. An important thing to take into account is the geographic position of these localities (marginal areas in the county), having weak connections with the cities. The high number of communes in this category shows the inflexibility of these localities.

The third category is the opposite to the second one, having all the values positive, including settlements with high values but also high unemployment rate. This category has 5 standard deviations of maximums, being characterized by elevated values for the school population and the teaching staff, but also by a high degree of unemployment. An encouraging aspect is given by the high values of the expenses in education, which means that the local authorities want to offer the chance for social and educational development. This category is no longer identified in 2016.

The fourth category in 2010, i.e. localities with a disadvantaged population, includes settlements that are mainly situated in the north-eastern part of the county, being called the category of the . All the values are positive, but because of their disposal we can also state that this category has a high number of unemployed and a large school population, but lacking an advanced economy, in which the local communities do not offer sufficient funds for education. The low number of households indicates either low values for the local population or the fact that there are important communities of Romani people (Berevoiești 28%, Cetățeni 26%, Dragoslavele 21.6%, Stoenești 12.5% in the year of 2011). Similarly, in2016, we also have the fifth class, where one can see a greater compaction of the localities with these characteristics in the proximity of Câmpulung Muscel.

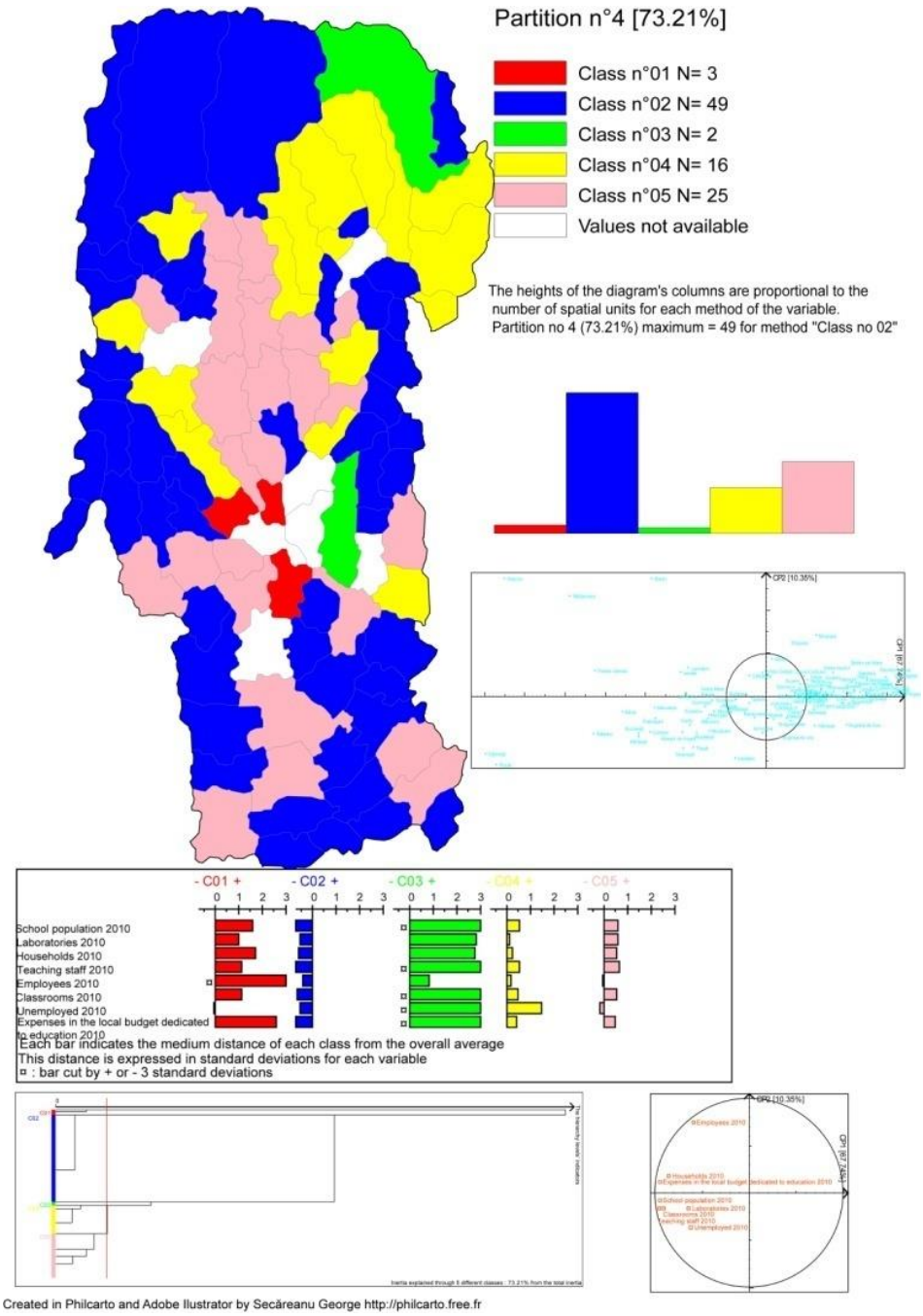

Fig. 5 HAC for the year of 2010. Processing after data from the National Institute of Statistics. Made with Philcarto (http://philcarto.free.fr)

The fifth category includes localities where most of the active population works in the primary sector, a trace attributed mainly to the central-southern part of Arges county. This category has a positive standard deviation of 0.5, except the number of employees and also the one of the unemployed, which proves the fact that these areas represent centers, which could be developed more, given the fact that they gave an adequate school population and infrastructure. Also, the low number of the school population shows a great weight of the aging population (Bârla 24.8% and Ungheni 32.2% population older than 65), being similar to the second category, but having a better economic profile.

The fourth category in 2016 is a new one and it is composed of two localities, Mărăcineni and Bradu, which were part of the first category in the year of 2010. These units are characterized by a high number of employees with a much lower school population when compared with the analysis at the level of 2010, because of the economic instability in the municipality of Pitesti. As in the case of Bascov, we can identify here an high number for the unemployed, because of the sudden fluctuations in economy.

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The category of the localities with a well-developed educational system but with a declining population in 2016 has been split off from the first category. This category replaces the one of the third class (from 2010). These units are characterized by an increased number of employees but with a much lower school population when compared the analysis based on the year of 2010 and this is due to the economic instability identified in the municipality of Pitesti. Also, there is a high number of unemployed, the same as in the case of Bascov.

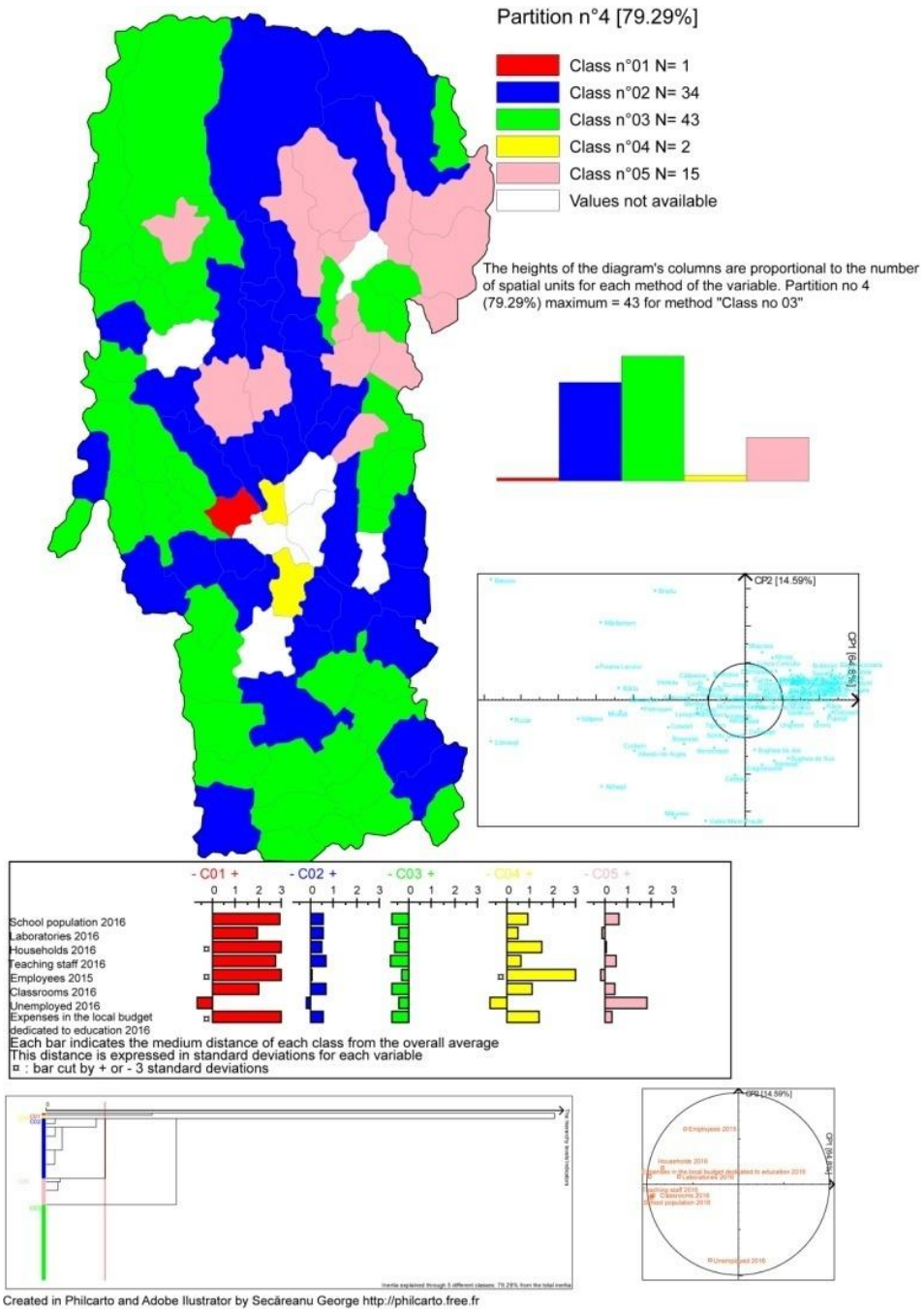

Fig. 6 HAC for the year of 2016. Source: National Institute of Statistics. Made with Philcarto (http://philcarto.free.fr)

The analyses for these two years, 2010 and 2016, offer a picture of the educational factors in the rural areas of Argeș, but it also shows a certain stagnation of the communities' characteristics: either they are at great distance from the main urban poles or they have a very well defined rural character which allows for changes throughout time. Another issue is represented by the disadvantaged communities who hardly want to give up their way of life. On the opposite side, we have the localities lying in the proximity of towns which are well connected to the national economy, therefore they constantly meet

major changes in their socio-educational infrastructure. The migration of the young population towards more economically attractive areas is a problem for schools, impacting on the school population.

Conclusion

In our analysis, there are several types of categories for the educational structures, and, with them, we have also adjacent problems. One of these categories is represented by the fact that the localities found in the vicinity of towns are very receptive to changes in the socio-educational field and are also economically developed (Cruz & Teixeira, 2015), therefore they can financially sustain expenses in education. These categories are represented by class I from each analysis, being considered stable-positive.

The second category refers to the localities at the opposite side, which are dominated by an aging population because the young one chose to migrate to more financially attractive areas. This category corresponds to the third class being considered a stable-negative category.

The fourth category is the one representing the disadvantaged ethnicities, who have many children whose educational structure doesn't change when the economy or the society does (Aslund et al., 2010). The localities have the same characteristics from one analysis to another, presenting a below average level of development.

The fifth category is represented by the population whose main activity is found in the primary sector. These localities keep their characteristics during the two reference year, having an average stable character.

In terms of changes over time, two different trends should be pointed out. When comparing groupings at the beginning and at the end of the study period, 69 localities (73%) have not changed their category, indicating stability in the quality of education services. At the same time, 18 localities (19%) switched their initial category to a better one, showing a progress in education service provision comparing to other administrative units in the county. There are, also, 8 cases in which localities changed their category to a worse one, suggesting that these units stay behind comparing to the rest.

The approach in the analysis of certain small communes increases the intensity with which the socio-educational phenomena impact the social structure of the area and thus, for long periods of time, certain villages can be highly depopulated because of the industry in the big cities (Crescenzi et al., 2012). There are also localities with a young population coming from disadvantaged areas and with a weak education given their family conditions or the impossibilities of the local agents to invest in the society's development (Torres & Carte, 2016).

Another consequence that can be traced within the developed communities is the phenomenon of social emancipation. In this case, young people form a family much later, they do not want to have children or they cannot raise more than a child.

Therefore, the educational situation has suffered alterations after the financial crisis and its categories are constantly being reorganized. Even if the majority of the migrations have been made towards higher categories, qualitatively speaking, the problem of the negative categories will still be significant due to high share of these communes in the county.

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Author contribution

All the authors had equal contribution.

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