

**DEMOGRAPHIC SPASMS –
A LIMIT OF SUSTAINABLE TERRITORIAL DEVELOPMENT.
CASE STUDY: THE DISTRICT OF CICEU**

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ABSTRACT. – Demographic Spasms – A Limit of Sustainable Territorial Development. Case Study: The District (“Ținut”)² of Ciceu. Human component is currently the most precious resource, the only one which can generate production and consumption, fact that makes it play an important part in the sustainable development of the territorial unit it occupies. However, we know that most of the changes take place at the level of this component, of action and interaction, usually materialized in malfunctions, in demographic spasms constraining the support and design of a certain trend of development. Starting from this assumption, in this study, we analyzed the demographic spasms manifested in the District of Ciceu, a rural micro-region located in the central part of the North-West Development Region, where the decline of the population, especially the young one, as a result, distinctly or cumulated, of several mechanisms, has increased the imbalances between the age groups, leading to an increase of the economic dependency ratio and the age dependency ratio, a situation that raises serious questions as it appears that the population is below the limit required to support the sustainable development of this unit.

Keywords: *demographic spasms, the District of Ciceu, sustainability, dependency ratio, birth rate, death rate, emigration, immigration.*

1. INTRODUCTION

The demographic decline, obviously noted after 1990 in most of the developed or developing countries as Romania, is caused, at the level of each territorial unit, by a series of negative demographic phenomena, such as the decrease of birth rate, the increase of rural emigration and the massive emigration of adults, leading to a reduction of the ratio of the middle aged group, of the active population, of the fertile female population and of the children. In fact, these are the main causes directly contributing to the damaging of the age structure, of the social-professional structure, implicitly of the entire demographic mechanism, leading, therefore, to an imbalance between inbounds (birth rate and immigration) and outbounds (mortality and emigration) of the demographic system³.

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² “Ținut”, in Romanian, is equivalent of a regional taxon – microregion.

³ According to Vert C. population is to be studied “in a systematic vision” because at this level there is a continuous change in the number, structure and distribution of elements which, moreover, are interconnected. (Vert, C., 2001, *The geography of population, theory and methodology*, Edit. Mirton, Timisoara, pp. 16, 17)

However, the imbalance is caused by a lack of a counterweight between the demographic increase (demographic boom in the case of poor countries) and the biotic capacity of feeding a continuously increasing population. *These processes, with fundamentally negative evolutions, are seen as **demographic spasms**⁴, that constrain sustainable territorial development, drawing limits in its path, beyond which the demographic system becomes unable to support.* Of course, negative effects will be visible in the first instance at the level of the social development, but they will have a negative, long-term economic development, i.e. on those dimensions that ensure sustainable territorial development.

Without pretending to be exhaustive, the study aims to examine the phenomena that are in demographic spasm and the effects (conditionalities, consistencies) that they have on the sustainable development of the District of Ciceu, a rural micro-region where the population decline caused a reduction in workforce, thus stagnating in terms of human resource development. Also, this paper assesses the current state as well as the future possibilities of development of the District of Ciceu by means of human resources.

2. METHODOLOGICAL ISSUES

Sustainable development is the main objective of EU policy, and must be understood as “an indestructible aggregate of phenomena, processes and rules, unique in their spatial dynamics and interrelation”⁵, by which is aimed at economic and social affirmation of the territorial unit which it contains, removing disparities between countries, but also within the same country, in fact asserting territorial cohesion⁶.

Sustainable development aims to be a human development, achieved by the will of men able to produce, through the activities they carry out, the economic assertion of the region (state, etc.) they occupy, and its final result is welfare both individually and collectively. Thus, we find that natural and human resources are the main vectors of development in any territory, but the emergence of negative demographic phenomena endangers the optimum ratio population-resources and sustainable development can not be sustained in these conditions.

Demographic spasms, as limits of development in general, the sustainable one in particular, can be analyzed in terms of their component phenomena and their worrying evolution. Globally, there are two situations that cause demographic spasms. The first one is about overpopulation, as in the case of certain territories (South America, Africa, Asia) where population growth has become a problem because it was not linked to economic growth (underproduction as a result of the multiplication of the population). Secondly, there are territories with various resources (most of Europe, North America), but the population is below the one required to support sustainable development, as it

⁴ Cocean P., notes that certain phenomena are established as the true limits beyond which sustainability becomes questionable. (Cocean, P., 2010, *Regional Geography* - third edition restructured and added, Edit. Presa Universitară Clujeană, Cluj-Napoca, pag. 145)

⁵ Cocean, P. (2010), *op. cit.*, pag. 133.

⁶ In the documents SDEC (*Schéma de Développement de l'Espace Communautaire*) „[...]territorial cohesion is assigned a central role in the organization and management of community space. It becomes not only the third dimension, along with the economic and social one [...],but also a corollary of the development itself.” (Cocean, P. (coord.), 2009, *Mărginimea Sibiului. Planning and landscaping*, [...]). (Cocean, P. (ed.), 2009, Edit. Universitară Clujeană, Cluj-Napoca, pag. 7)

is marked by a deep demographic decline resulted due to several mechanisms, such as the rural migration, higher than the natural increase; increased mortality; decline of the birth rate and its continuous low level.

Methods and techniques used during the study:

- The *observation method* (direct observation of demographic phenomena, especially those related to migration) was used during the field stage to collect data, and both *observation* (on maps, satellite images), as well as *bibliographic documentation* (census data) were used in the office;
- For data analysis and processing we used *analysis method* either inductive, deductive or geographic description, *statistical-mathematical methods* (data interpretation, graphics, age pyramid), as well as *cartographic methods* (GIS);
- The *synthesis* (comparison, classification) and *hierarchization* were used to deliver the results.

To perform this study, the data were provided by the Cluj County Department of Statistics, INSSE Bistrița-Năsăud, INSSE Sălaj, the data recorded at the censuses of the years 1992, 2002, 2011, or those collected during the bibliographic documentation.

3. STUDY AREA

The District of Ciceu (fig. 1) is located in the North-North-West part of Romania, in the contact area of the counties Bistrița-Năsăud, Cluj and Sălaj. From the administrative point of view, fourteen communes are included within the limits⁷ of the District of Ciceu. Most of the territory of the land is located northwards from the confluence area of Someșul Mare and Someșul Mic rivers.

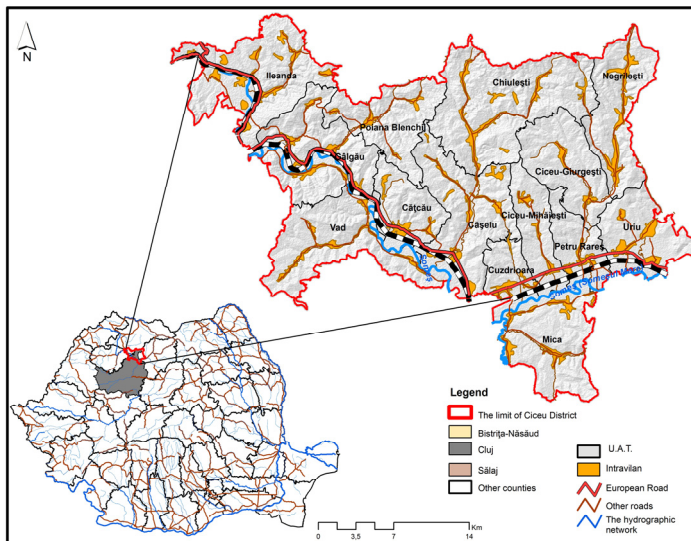


Fig. 1. Regional and national localization of the District of Ciceu.

⁷ In this study we use the historical limits of the District of Ciceu.

4. ANALYSIS OF DEMOGRAPHIC SPASMS IN THE DISTRICT OF CICEU

In the District of Ciceu, sustainable development is limited by demographic spasms which occurred as a result of population migration (both international and rural-urban migration), decrease of the natural balance and population aging, decrease of the economically active population (working in industry) and the resizing of the industrial activities of Dej City. Therefore, the demographic phenomena analyzed in this study are: *the numerical evolution of population, the general density and distribution of population, the population dynamic and the demographic structure of the population.*

3.2. Numerical evolution of the population

The numerical evolution of the population is an important indicator used to assess the quantitative trends of a population.

Analyzing the number of inhabitants in the 14 communes of the District of Ciceu at the censuses of the past 100 years, one finds that there were two trends, one of growth between 1890 to 1977 and a decrease since 1977, but decrease was higher after 1992. Evolutionary population trends were found by calculating *the absolute growth over a certain period* (fig. 2). Thus, we see that the District of Ciceu population decreased by more than 5500 inhabitants between 2000 and 2012. In 2012, the total population was 37308 people.

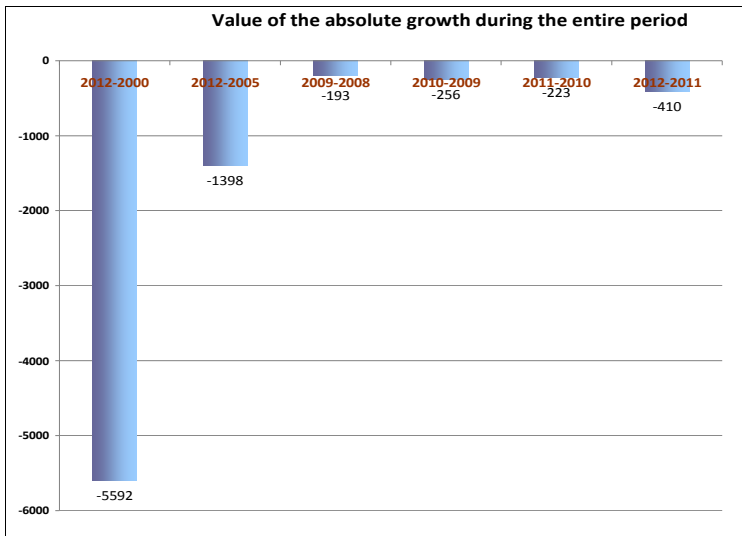


Fig. 2. The District of Ciceu. Value of the absolute growth during the entire period.

3.3. Population dynamics

The negative natural and migration balance are the main demographic characteristics of the population dynamics in the District of Ciceu.

The birth rate at the level of the area analyzed, is recorded in the relatively low trend, its values being, during the analyzed years, lower than the **mortality rate**. Analyzing birth rate and mortality rate at the level of administrative-territorial units, we notice certain significant differences. The lowest value of birth rate was recorded in the communes belonging, from the administrative point of view, to Bistrița-Năsăud County (for example, in Ciceu-Giurgești, in 1992, birth rate exceeded mortality rate, having the value of 15‰ and mortality was of 12‰, while in 2012, birth rate dropped to 6‰, and mortality rate increased to 25‰). Of the communes, Ileanda makes it self noticed, with a remarkable birth rate, higher, during the last analyzed year, than the mortality rate (fig. 3).

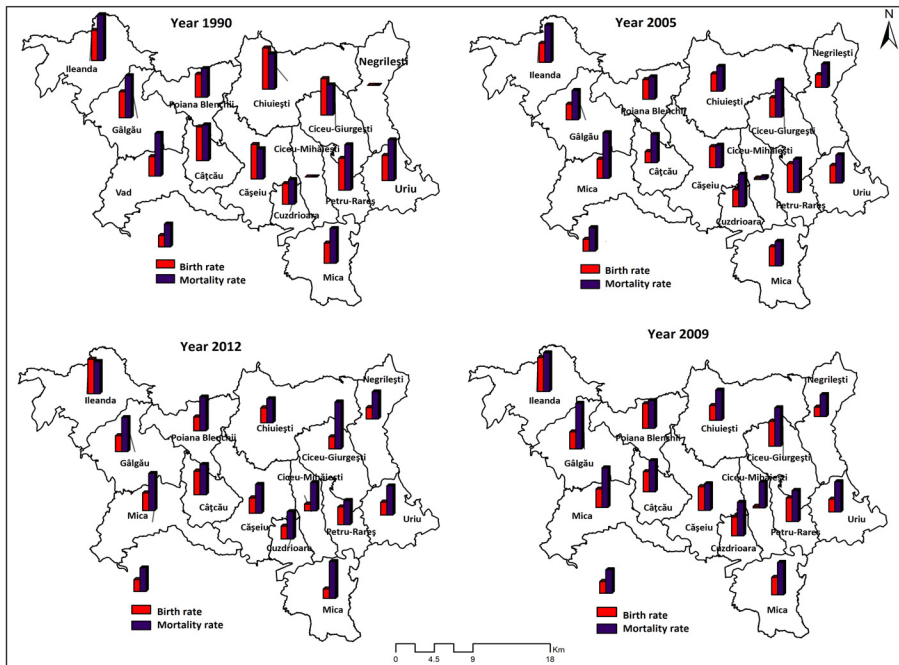


Fig. 3. Evolution of birth rate and mortality rate in The District of Ciceu (‰).

Natural demographic balance, the expression of the difference between the birth rate and the mortality rate has mostly negative values during the years analyzed, its values giving us a picture of the county population natural decrease.

This is one negative demographic feature of ex-communist countries, where economic and social transition has had an impact on the evolution of birth rate.

The fall of the communist political system influenced the decreasing of birth rate, because after 1990, every woman had the right to abortion, and if you look at the map of the evolution of birth rate and mortality (fig. 3), we see that the general trend is the decrease of the birth rate until 2012. This may be explained by the change in the mentality of the population, as the traditional family (specific to rural areas) is fading away.

Having many children is no longer a priority and most families have one or two children. The liberalization of the population movement led to increased migrant population, leading to a reduction of young population, and *of women of childbearing age*.

One must bear in mind that the female population of childbearing age, in the coming years, will come from generations born in a period (after 1990) when the birth rate remained low, so there will be a reduction of the fertile female population, automatically, the demographic aging process intensifies, one of the consequences being the increase of the mortality rate and further population decline, even of catastrophic dimensions.

Demographic spasms caused by **external migration** in conjunction with the **negative natural balance** hindered the development of the District of Ciceu due to their negative effects and, more specifically, due to the direct loss of the human resource and, more important, the effects in time of the deterioration of the population age structure. We have no data regarding the age of the population who emigrated from the analyzed area, but given that the value of the aging index of the population is very high, and knowing that labor migration in recent years has become the most important component of Romanian migration, we can say that the population who emigrated is mainly from the group of working age population (19-64 years). Because of this migration, but also the causes mentioned above, the birth rate stays low so in the future there will be a drastic reduction in the quantity of labor force when the current active population will fall into the category of aged population and its place will be taken by those born in this period of demographic decline.

Migration involves severe consequences at different levels: the economic, the social and the demographic one. In the District of Ciceu, migration reached its climax after 1989, in 1990, when the border barriers fell, but one notices (fig. 4) that the **rate of emigration** reached peak levels, higher than the net immigration. In 2004, when we can speak of national economic stability, the **immigration rate** exceeded the emigration one, situation which also partially occurred in 2007.

After 2007, the situation changed because Romania was already a member state of the European Union and the movement of Romanians was completely liberalized (in some European countries). This determined that another wave of massive loss of human resources through emigration, on the grounds of the economic crisis which was felt after 2008, but also the reshaping of industrial activity in Dej City, which ensured the jobs needed by the people of the surrounding areas for a long period, so the emigration rate of 2012 is comparable to 1990.

If we look at the values of migration rate at the commune level, it comes out that Vad commune lost the highest number of people in this way. In 1990, in Vad, the highest rate of emigration from the analyzed area was recorded, 183 emigrants out of 1000 inhabitants, and the rate of immigration on the same year was only 5 ‰. However, Vad commune is to be noticed in terms of reducing the number of inhabitants due to the natural balance, as the mortality rate remained at values above 25 ‰ between 1990-2012, while the birth rate had annual values under 8 ‰.

It should be noted that the immigrants include those who migrate to another place than home. In this regard, we point out the rural migration to urban centers, especially the developed ones. At the level of the province (land), their share in the total number of

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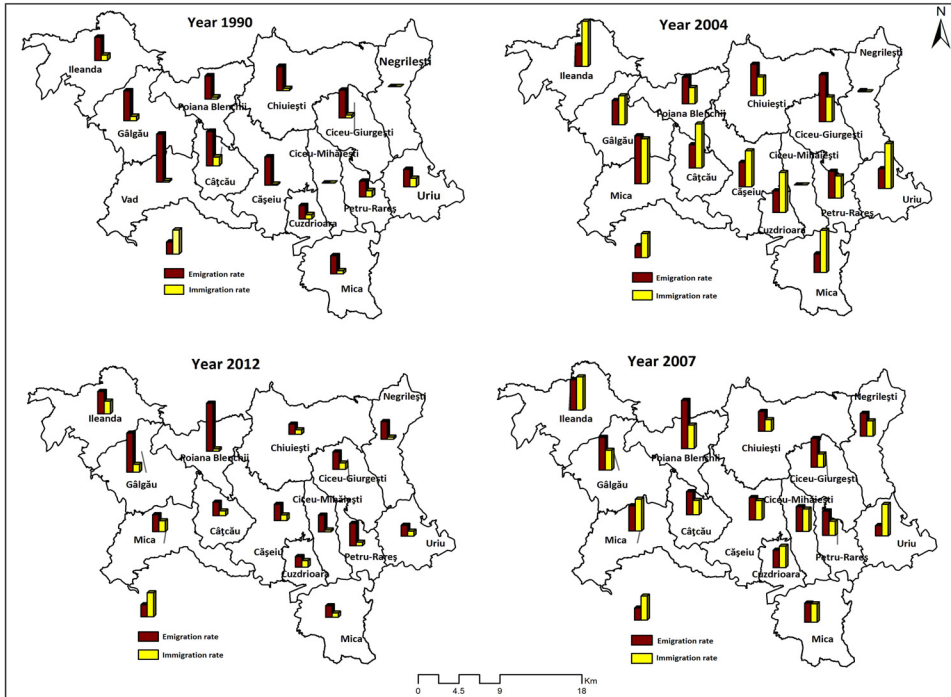


Fig. 4. The District of Ciceu. The evolution of emigration and immigration (%).

emigrants is not known, because there are no statistical data including domestic migration to other places in Romania. However, out of some discussions with representatives of the analyzed communes, it comes out that most of those who changed their residence moved to national urban centers, especially to the city of Cluj-Napoca. Regardless of the share of migration to another city in Romania or international migration, the total number of migrants remains important because it is obvious that those who are gone from one locality in the study area, changing residence or home, will be out for a long or permanent time, loss which results in fewer people of working age, in fact the population which these communities need for their economic, social and demographic development. In addition to this loss of human resources and the deterioration of the population age structure, there is another dimension of international migration, as dramatic as this one, acting especially at the social level. There are cases in the District of Ciceu where, from some families, parents are abroad and do not take their children with them, therefore grandparents, other relatives or friends take over their children' guardianship, which has negative repercussions. There are few cases of school abandonment, but this should be borne in mind, not to multiply such cases.

The loss of human resources results in slowing growth or even to decline in economic activity. In general, most people who migrate are young and their share is growing and therefore immigration affects the age groups with high rates of fertility,

thus reducing the potential for newborns. Due to this process and also due to increased longevity, the District of Ciceu is currently facing an accelerated process of **population aging**.

Another aspect of population decline, which has repercussions on the development of the District of Ciceu, is the deteriorating **age structure of the population**. Its effects in time are more important, as it leads to the aging of population. This demographic phenomenon is already known and has an impact in this micro-region, so the value of the demographic dependency ratio is very high. If we analyze the *population by age groups* (<19 years, 20-64 years, > 64 years), at the last three censuses (fig. 5), we notice that the elderly group increased by 6% during 1992-2011. The proportion itself is not very high, considering that 19 years have passed, but it should be noted that the share of 22.9% elderly population in the total population is a large one, which indicates that the population of the District of Ciceu is aged. It is more worrying that in 2011 the reduced number of young population was approximately equal to the number of elderly population, which supports the earlier claims that a decrease in working age population, an acceleration of the aging process of the population and an increase in the dependency ratio of elders will occur in the near future. Between 1992 and 2011 the group of adult population (19-64 years) decreased slightly (there were 4592 fewer people in 2011 compared to 1992).

The changes in population dynamics of the District of Ciceu have contributed greatly in a negative way, to the increase of the **dependency ratio** and **aging index**.

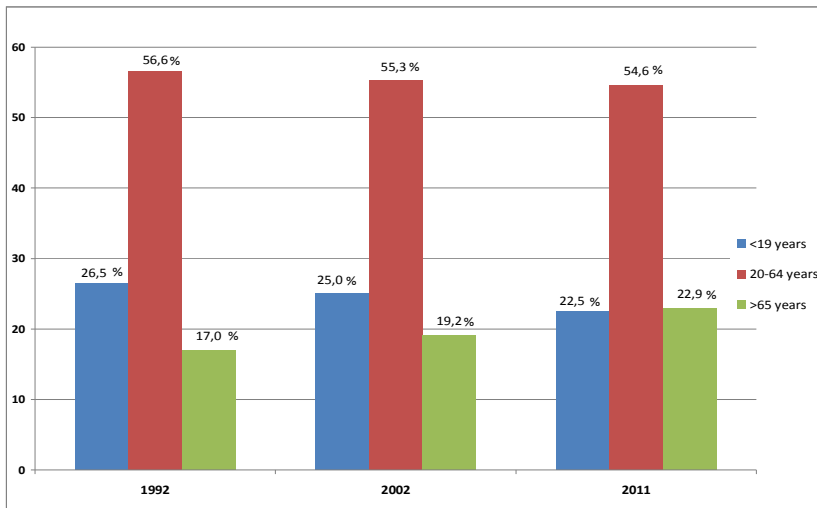


Fig. 5. The District of Ciceu. Evolution of population by age groups.

The *aging index* resulted by reporting the elder population (> 64 years) to the young one (0-19 years) indicates that the population of the District of Ciceu tends to grow older. Its value during the years analyzed was over 0.42 at the level of every commune. Therefore young population is less than one third of the total population. The

decline in active population and the aging of workforce is a major trend characterizing the demographic evolution of the District of Ciceu. Therefore, demographic dependency ratio has values indicating a high “pressure” of the population aged 0-19 years and 65 years and over on the population aged 20 - 64 years.

The demographic dependency ratio in the entire area studied had slightly higher values in 2011, when 83 people of inactive age corresponded to 100 people of working age (fig. 6).

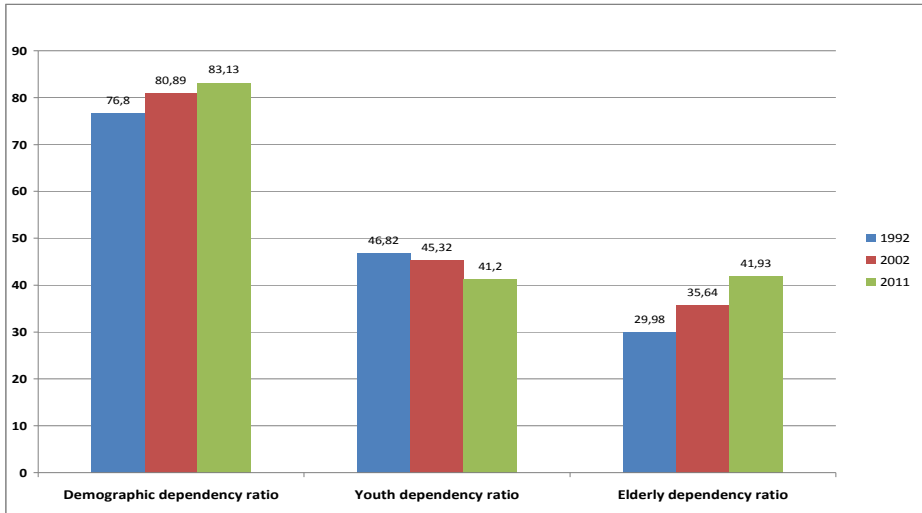


Fig. 6. The District of Ciceu. Evolution of the demographic dependency ratio (%).

Analyzing separately the categories that exert pressure on the working age population, we note that the elderly dependency ratio increased while the youth dependency ratio fell. Therefore, there will be less young population to enter the segment of the active population. The alarming increase in the elderly dependency ratio in the District of Ciceu, amid fluctuations in other categories of the population, has many social and economic implications, especially in terms of sustainability of pension systems. Reduction of the working age population may result in structural problems in the labor market.

Analyzing the population by gender, it came out that the share of the female population over 55 years is higher than the percentage of the male population of the same age, which causes a greater pressure on the pension system, knowing that the standard retirement age of the female population is lower than the one for the male population.

Under these conditions, of high demographic dependency ratio and deteriorating age structure of the population, the natural question is: what is the future of the working age population in the District of Ciceu? To find an answer to this question, we calculated the labor replacement rate, which renders the number of entries (population 15 to 19 years) in the population of working age per 100 outputs (population 60-64 years) of

the working age population. According to the result (fig. 7), the perspectives are highly questionable from this point of view. We note that in the communes affected by a deep process of population aging, the chances of the population exiting the active segment are minimal.

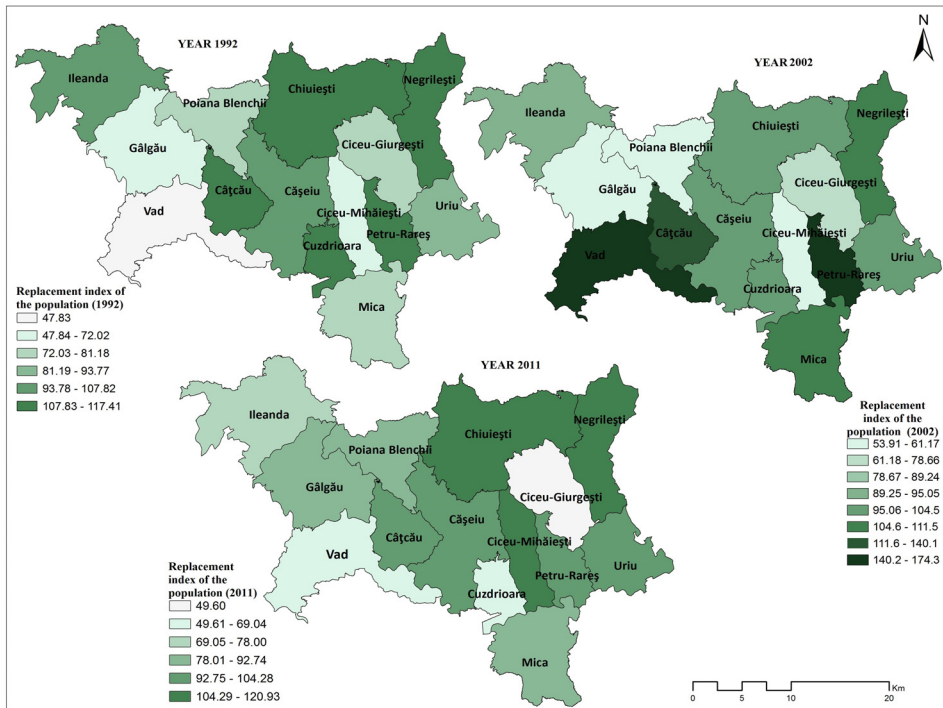


Fig. 7. The District of Ciceu. Evolution of the replacement index of the active age population (%).

Demographic spasms, have the worst implications in the process of sustainable development for any territorial entity and have an impact on the **social-economic structure of the population**. The economic structure of the population is given by the categories of the active and inactive one. In particular, the working population consists of people employed and those seeking employment (in the latter category we included the unemployed or those who are looking for their first job), while the inactive population includes all the persons not engaged in an economic-social activity and who are not looking for a job.

In the District of Ciceu, at the level of the professional structure of the population, demographic spasms occur due to numerous factors, including: the aging of the population, loss of labor through immigration, social-economic transition, reducing economic activity, especially the industrial one, leading to an increase of the number of unemployed, anticipated pensioners; also, it shows that many young people opt to continue their education after they turn 20 years of age without having a job.

The overall activity rate of the population, given the weight of the active population in the total population, was calculated at the last three censuses. It has experienced two opposite trends: a decline between 1992 and 2002, and an increase between 2002 and 2011. The overall activity rate decreased, which was felt, especially in the area bordering Dej City (fig. 8), where the scaling of industrial activity in the period immediately following the fall of communism, led to a rapid growth in the number of unemployed persons on the background of social-economic changes during the post-communist period and the inability of economic structures (services sector) to absorb the labor force from the industry.

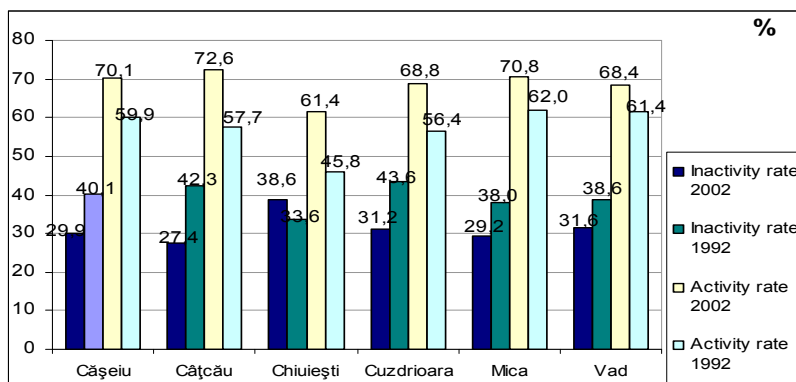


Fig. 8. Evolution of the activity and inactivity in the surrounding area of Dej City (%).

The overall inactivity rate had high values throughout the analyzed period (1992-2011), determining a very high economic dependency ratio. In 2002, in each commune, the share of inactive population in the total population exceeded 65%, reaching a maximum of 72.6% in Cățcău commune. A significant increase of the activity rate in the period 2002-2011 was recorded in the communes belonging to Sălaj County. Thus, in 2011, in these administrative-territorial units, the activity rate increased by over 15% compared to 2002, when the activity rate of the population was low. The highest values of the activity rate, between 2002 and 2011, were recorded in the communes which belong to Bistrița Năsăud County. In some cases the activity rate values were higher than the inactivity rate, as for example in Ciceu-Giurgești and Negrilești, where the rate of activity had higher values than the inactivity rate both in 2002 and in 2011.

Analyzing the inactive population categories between 1992-2011, we find that the share of the population supported by other persons or the state increased significantly. Thus, in 1992 their share was reduced, while in 2011 it increased significantly. The situation is worrying because this category includes, among other social cases, those depending on the welfare state, which means that although there are people considered of active age, they do not hold a job, amplifying the pressure on the state economy.

At the basis of the claim according to which the rate of active population of the District of Ciceu has decreased due to resizing industrial activity, sits the *professional structure of the active population*, according to which a high proportion of the active

population worked in the secondary sector in 1992 (fig. 9). Therefore, at the level of the entire studied area, there was a sharp drop in the employment in the secondary sector. In 1992, over 30% of the total population was active in this segment, while in 2011 only 9.1% of the population was active in this sector. The reduction of the working population in the secondary sector led, besides the growth of the inactive population, to a conversion of redundant labor from industry to the primary sector. Many of these people currently work in agriculture, but this is worrying for the economic development of the province, as the agriculture specific to Romanian rural areas is subsistence farming and most people working in agriculture actually work in their own household.

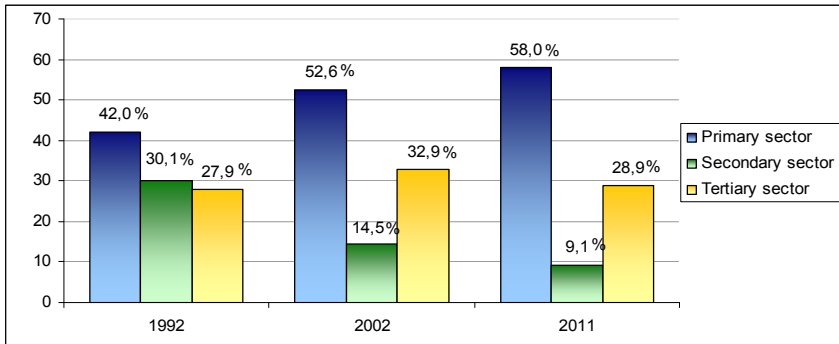


Fig. 9. Active population by economic sectors.

Analyzing the *unemployment rate of the population* in the District of Ciceu (fig. 10), it came out that it decreased between 1992 and 2011, but it should be noted that the decrease in the unemployment rate did not occur due to jobs available to the unemployed, but due to the short legal period of unemployment. Most of the unemployed joined the inactive segment, thereby increasing the economic dependency ratio.

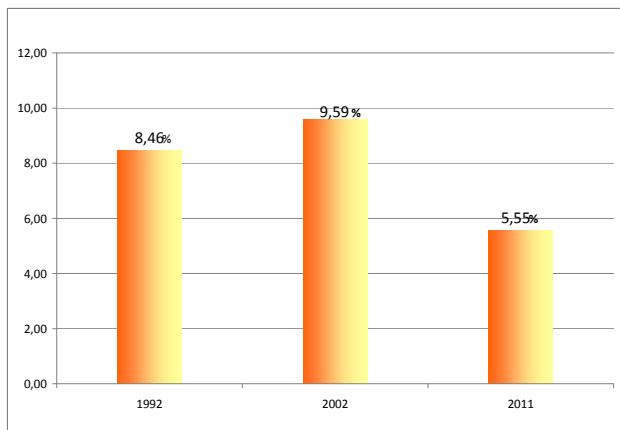


Fig. 10. Evolution of the unemployment rate in the District of Ciceu (%).

4. CONCLUSIONS AND PROPOSALS

Demographic spasms limiting sustainable development arise from the imbalance that occurs between inputs and outputs of the demographic system. In this sense, globally, demographic spasms occur either in the territories where the population boom is not related to the carrying capacity of the territory or in the territories where population decline compromises the production by drastically reducing the human resource. This latter situation characterizes Romania, respectively the District of Ciceu, micro-region whose capacity in terms of human resource development has been analyzed in this case study.

The current demographic situation of the District of Ciceu is the cumulative result of complex developments, birth rate (fertility), mortality rate and external migration after 1990. These negative fundamental developments deteriorated the age structure of the population, accelerating the aging process. It is worrying that due to an external migration higher than the natural growth and also mortality rates higher than birth rates, there has been a drastic reduction of labor active population, thus increasing the demographic and economic dependency ratio. This situation will worsen in the future, given the low percentage of young people who will enter age of employment in the coming years. The increase of the dependency ratio of elderly people deepens, on short and medium term, the effects of the economic crisis.

On the grounds of the lack of jobs, the population decline in the District of Ciceu after 1989 did not have, until now, dramatic economic effects, but the danger is imminent. With a population aging index exceeding the value 1 and a low economic activity rate (the active population is under 40% of the total population), the question is how viable is the District of Ciceu capacity of development, problem for which solutions must be found so as to stimulate the positive development of population and hence labor resources.

In terms of human resources, several strategic directions of development in the District of Ciceu could be:

- attracting investments and undertaking activities to capitalize intense and appropriate local labor, strictly correlated with its degree of skill;
- maintain the working population through the development of economic activities both in the secondary sector, of production, and the tertiary sector of services;
- helping people who left from the communes of the District of Ciceu to come back and start up businesses to capitalize the existing natural and human potential;
- starting projects to attract European structural funds for development;
- reduction of employment in agriculture by developing competitive agri-food economic sectors (processing of local agricultural products, marketing of traditional agro-pastoral products, creating organic farms whose products are required by the specific European markets).

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