

Article

A Difficult Pattern to Change in Romania, the Perspective of Socio-Economic Development

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Abstract: The rural area is a basic component from a socio-economic point of view, being closely linked to the activities that take place in these areas. Normally, Romanian rural localities should show significant differences from one development region to another, being influenced by a number of factors (geographical positioning, the influence of agriculture in the economy, etc.). In this sense, data were collected from the town halls of the localities from Calarasi and Timis counties. The analyzed data were processed by the linear regression method, and the estimation of the evolution of the population was determined using the Vensim simulation program. The paper identifies a pattern in rural localities in Romania that hinders their development, reflected by various socio-economic indicators available in the analyzed localities. The main factor that can change this pattern in rural localities is the influence of local and national decision-makers, who can encourage investment in these areas either through the development of local and national infrastructure or through fiscal measures that encourage the development of quality non-agricultural activities that can generate financial resources and jobs at the local level. Moreover, it is not only the low number of non-agricultural activities that is causing the poor development of rural areas, but rather the low number of economic operators in general and the quality of these types of activities, which in most cases do not have the capacity to create new jobs.

Keywords: rural development; sustainable; rural area; localities; evolution; local authorities; Romania



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1. Introduction

The concept of "rural" includes several dimensions that refer on the one hand to the predominant activity in rural areas—agriculture—and life in rural areas, including people engaged in agriculture or other related activities [1–4].

According to Bold and Buciuman (2003), "rural" can be defined as the totality of activities that take place in a space other than an urban one, with a relatively small number of inhabitants, who have multiple relationships with each other and where agriculture and forestry have an important role [5,6].

According to some authors who have researched this complex concept, over time the idea has emerged that "rural space" includes everything that is not urban. Among the multiple definitions assigned to the term of rural space, the most representative are [7–9]:

- The rural area can be characterized by a relatively small number of inhabitants, with a small number of buildings, and where there are mainly natural landscapes, where

nature blends perfectly with the activities that man undertakes. In the rural space, the activities mainly carried out by its inhabitants are agriculture, animal husbandry, forestry, or beekeeping.

- The rural area can also be characterized as having a multitude of non-urban areas, which include fields and people carrying out activities associated with field work;
- The rural area is the ideal environment in which agricultural activity can be developed and where, compared to urban areas, the concentration of people is low.

Taking into account the “artisanal” dimension of the rural space, we can say that the rural is not only related to agriculture, but also includes all the activities carried out by folk craftsmen or activities with a tourist profile. Whether it is wood carving, weaving, or making traditional sandals called *opinci*, all these activities are specific to the rural area and define the identity of the Romanian people [10–13].

Various authors consider that the modern rural area is the result of a complex process of continuity and discontinuity, where the new life models replace the traditional ones and the modernization of the villages and rural communities implies its transformation as a whole [14].

The term “rural area” is also widely used in politics and economics, but there is no accepted unitary definition. However, it can be stated that a more accurate definition of rural space consists of a “diverse and complicated economic structure that includes villages, small towns, forests, commercial activities that may include tourism, small companies, craft workshops, small and medium industry, landscapes, and cultural traditions. This indicates the high degree of complexity that such an area has [15].

In recent times, rural regions from Romania and beyond have seen significant population declines [16,17], with people often choosing to migrate to urban centers or other countries. The factors behind this phenomenon are particularly complex and interrelated [18,19]. Most research indicates that the two main aspects that lead to the successful development of a locality are its geographical location and local and regional resources [20–23]. Being located close to urban centers generates multiple advantages for neighboring localities, as they can find jobs in urban centers [24,25]. Mountain areas, with their impressive landscape potential, can also develop other related activities and tourism, but this cannot be achieved without a developed road infrastructure (Figure 1) [26,27].

With the depopulation of rural areas, not only is cultural heritage lost [28,29], but food security is also under threat, especially as most food resources are obtained in rural areas [30–32]. Even the United Nations proposed that food security should be addressed at international, national, and local levels (Figure 1) [33].

Various authors have stated that the main activity in rural areas is agriculture, whether developed farms or household activities that provide a daily livelihood for the population. With the widening gap in living standards between urban and rural areas, more and more people, especially young people, have chosen to migrate, leaving the ageing population behind [34,35]. This has led to a fall in the birth rate and an increase in the death rate. The low rate of EU funding attracted by local authorities is reflected in the poor infrastructure in a significant proportion of rural localities, which can also be attributed to low interest and lack of funds to finance investments [36–38].

The aging population can no longer carry out the usual activities of growing crops or raising livestock, and households are unkempt [39]. The legal heirs of these properties have also left their native places, and selling the farms is not an option as there is no market demand, thus increasing the degradation of these farms [40].

A locality with a high number of inhabitants also has a high number of economic agents to satisfy local needs, but this is also influenced by the standard of living, which in rural areas is much lower than in urban areas [41,42].

With an aging population and an acute shortage of jobs, a high number of people on social assistance is generated, who have no other source of income to ensure their daily living [25,26,43].

incomes, low density, sustained population exodus), and areas with specific disadvantages (unfavorable natural conditions) [45].

According to Steiner, the main disadvantages of rural areas include low density, special social and economic structures, dependence on agriculture, low incomes, and difficult accessibility [46].

The Evolution of Rural Development in Romania

Until 1990, the emphasis of the communist regime was on the development of industry, which contributed to the development of cities, to the detriment of rural areas. Due to this aspect, there is still a significant gap between the two areas. In addition, during that period, a large part of the population in rural areas worked partly from their residences, until the emergence of the collectivization process, profoundly transforming the Romanian village, especially by dispossessing them of owned agricultural land [47].

After this period, the rural environment entered a new stage, with the return of the population to the rural area, where the process of restitution of agricultural land occupied by the communist regime was quite difficult and impartial, with small and very small areas being returned to the population and agricultural practiced being one of subsistence. The restitution of these lands led to the emergence of small and medium-sized farms, but with low productivity due to the lack of machinery and equipment needed to work the land. This led to the practice of subsistence farming, based on the production of primary agricultural products in small quantities [47].

A negative characteristic of the Romanian rural area is the demographic decline, caused by the decrease in the rural population, determined by the aging population, but also due to the migration of the population to the areas with better-paid jobs. Small businesses, especially those that create jobs, cannot grow due to lack of funding (co-financing), but also due to poor infrastructure. There has been a change in rural areas in recent years, especially in terms of demographic change, core occupations, and moral value [47].

According to data published in 2019, only 11.3% of the rural population had access to sewerage services, and only 40% of households have constant access to drinking water. It should be mentioned that a part of the rural population of Romania has the possibility to connect to these sewerage services, but the costs related to construction and connectivity are much too high for them [47].

The road infrastructure has significant deficiencies, with only 15% of the road network in rural areas being modernized, with the rest as dirt or cobbled roads (in 2019). Gas supply is also low, due to high connection costs but also poor infrastructure, including in areas with a high population concentration [47].

Due to the poor condition of primary and secondary schools, in recent years their number has been reduced by a third, which has contributed to an overcrowding of functional schools, but also an increase in schooling costs of students in the environment, Determined by their transport to nearby functional educational units [47].

Rural space, at the European level, is precious natural space as a result of a long history, and whose survival and revitalization is a constant concern for modern society [48–50].

At the European level, the member states of the European Union use their own definition of the term “rural area.” In France, the rural area is the territory where agricultural production is predominant and the landscape elements are found in their natural state [51,52]. On the other hand, the Belgians chose to define rural space as a set of natural landscapes and cultivated areas. The Germans consider that the rural area represents all the areas that are positioned outside the areas that have a large number of inhabitants [53–55]. In the United States of America, two terms are widely used to differentiate between rural and urban: “rural farm” (rural agricultural) and “rural non-farm” (rural non-agricultural), and this can be explained by the existence of two rural areas, some mainly agricultural and others where non-agricultural activities predominate in rural areas [56].

In Russia, rural areas are considered to be ones where the main functions are agriculture, forestry, fishing, and industrial activities of primary processing of these branches [56–58].

In other countries (UK, USA, Brazil), the definition is given according to the main occupation of the majority of the active population.

The most important regulation on sustainable development was given by Agenda 21, adopted at the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, attended by 178 countries and 120 leaders. The defined principles provided for measures to prepare people and authorities to produce and live differently than how they had before. Agenda 21 is the most important moment for the concept of sustainable development [33].

In its report entitled “Our Common Journey: A Transition towards Sustainability,” the Academy of Sciences of the United States of America tried to establish an order in terms of the definitions given so far of the concept of sustainable development. The authors of the US report believe that it is important to differentiate between the priorities to be supported by specific measures and the priorities to be developed. The scientists who contributed to this report found three important categories involved in sustainable rural development: nature, life support systems, and the human community. The first studies on sustainable development addressed, first of all, the economic aspects of the job-generating sectors. Subsequently, consumption and human health were taken into account. The authors of the American report believe that the approach to the concept of sustainable development has focused on the progress of society and the values and security of the welfare of countries, areas, and authorities at the national and local levels [58].

Sustainable development and rural areas are topics that have been analyzed and researched by scientists from countries such as Germany, Austria, and Poland. The need to preserve and develop the village has recently been studied due to the fact that people have become increasingly concerned with having a better, healthier life and the preservation of natural landscapes.

Moser et al. (2018) studied the extent to which the lives of people living in rural areas of Germany can be improved. In the paper entitled “Improving the quality of life through rural development programs in Germany (2007–2013). Evidence of the assessment,” the researchers from Germany analyzed the extent to which the rural development programs implemented in the 16 German Länder have fulfilled their purpose, that of enabling the sustainable development of the rural environment and improving the quality of life of the villagers. The results of the study showed that the improvement of the quality of life through the implemented development programs was achieved only in certain regions [59].

The LEADER axis, which is found in many rural development programs in the member states of the European Union, has been studied in terms of the effect felt by member states such as France, Germany, and Italy. In the paper entitled “LEADER as a European policy for rural development in a multilevel governance framework: a comparison of implementation in France, Germany and Italy,” Pollermann et al. (2020) analyzed the way in which the implementation of the LEADER axis in three different countries brought substantial changes to the rural area. The paper analyzed the similarities and differences between the three countries in terms of implementation mechanisms of the LEADER axis. The study was based on the analysis of documents and a series of interviews with stakeholders, and the institutional differences in the implementation of LEADER at the local level were analyzed in order to identify the best strategy for the development of the LEADER axis in the future [60].

3. Methodology

The focus of the study on the two development regions of Romania was based on the share of the rural population in the total population, and the extremes were selected. Thus, in the South-Muntenia region, in 2019, the share of the rural population in the total population was 60.3%, whereas the West region had the lowest rural population, with only 39.3% (except for the Bucharest-Ilfov region, whose socio-economic situation is extremely favorable in the context of its location in the immediate vicinity of the Romanian capital) (Figure 2).

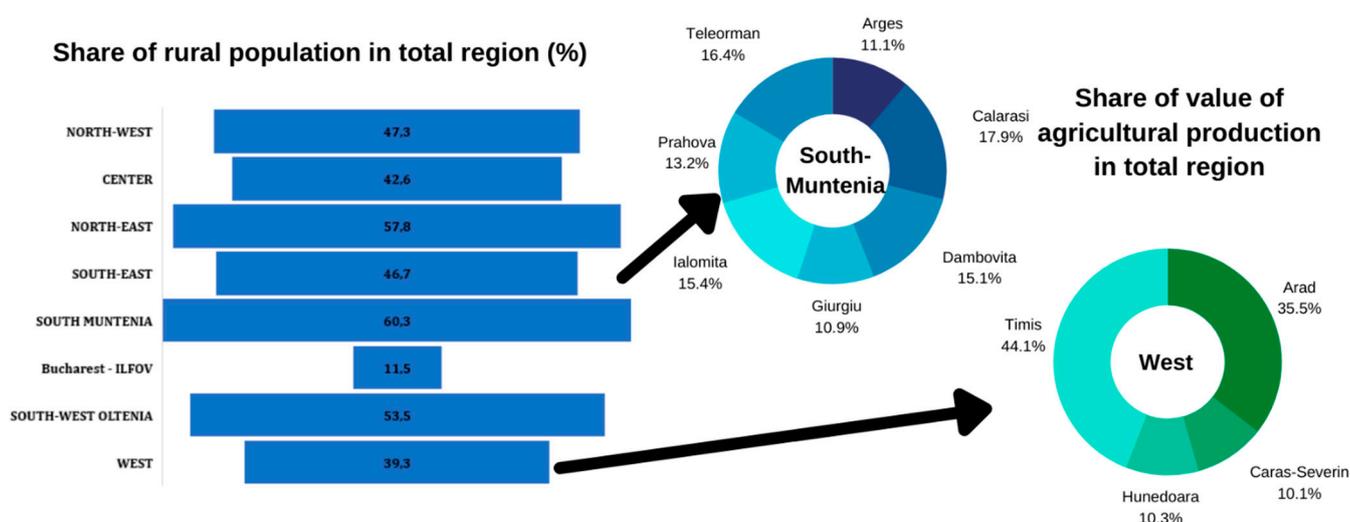


Figure 2. Relevant aspects concerning the focus of the study on these regions. Source: data processing INS through the Canva program.

Based on the situation described above, the counties with the highest share of agricultural production value in the region were selected, namely, Timis (West region) and Calarasi (South-Muntenia region), reflecting the influence of agriculture in local socio-economic development (Figure 2).

Hypotheses 1 (H1). *The high mortality rate due to the high number of elderly people contributes to the decline of the rural population.*

Hypotheses 2 (H2). *The number of households in rural areas tends to decrease as a result of the decrease in the number of inhabitants.*

Hypotheses 3 (H3). *The number of economic agents, which reflects the economic situation of the localities, influences the number of inhabitants.*

Hypotheses 4 (H4). *Population influences the number of people on social assistance. The number of people on social assistance is influenced by the number of inhabitants.*

In order to carry out this section, all the localities from the rural area (communes) existing in the two counties of Calarasi and Timis were identified. According to law 544/12.10.2001 regarding the free access to information of public interest, a request was sent by e-mail to all these local authorities in order to obtain information about them, classified in demographic/social, economic, and infrastructure indicators for the period 2015–2020 as follows [61]:

- Number of inhabitants;
- Number of households;
- Number of newborns;
- Number of deaths;
- Number of persons receiving social assistance;
- Number of economic agents, including those with an agricultural profile;
- Number of tourist units (including agrotourism units).

Given the fact that the request to the local authorities was official and binding for them, the number of requests received was quite low (Table 1).

It should be mentioned that the centralization of the information was carried out 45 days after the last e-mail sent in order to provide the maximum term, provided by law, to respond to the request.

Table 1. The centralizing situation of the answers received from the local authorities.

| County | No. Localities to Which Requests Were Sent | No. Localities That Responded to the Request | No. Localities That Did Not Respond | Share of Localities That Responded of the Total (%) |
|----------|--|--|-------------------------------------|---|
| Calarasi | 50 | 19 | 31 | 38.0 |
| Timis | 88 | 35 | 53 | 39.8 |
| Total | 138 | 54 | 84 | 39.1 |

Source: centralized data.

Because the large volume of data transmitted by the authorities does not make it possible to present them in this article, it was decided to present and analyze the following localities that responded to the request (Table 2):

- Criterion 1—the locality with the highest number of inhabitants in 2020;
- Criterion 2—the locality with the lowest number of inhabitants in 2020;
- Criterion 3—the locality with the largest number of economic agents in 2020;
- Criterion 4—the locality with the lowest number of economic agents in 2020.

Table 2. Communes that were selected according to the criteria needed to determine mathematical models.

| No. Crt. | Locality from Calarasi County | Locality from Timis County |
|----------|-------------------------------|----------------------------|
| 1 | Dragalina | Sanmihaiu |
| 2 | Nicolae Balcescu | Valcani |
| 3 | Soldanu | Peciu Nou |
| 4 | Sarulesti | Fardea |

Source: centralized data.

The rural localities, which will be analyzed from a socio-economic point of view and were determined according to the criteria mentioned above, were Dragalina, Nicolae Balcescu, Soldanu, and Sarulesti for Calarasi County. Regarding Timis County, the localities that were selected were Sanmihaiu, Valcani, Peciu Nou, and Fardea (Figure 3).

The socio-economic analysis of the localities also took into account aspects related to geographical location and local resources (Table 3).

Table 3. Classification of the analyzed localities.

| No. Crt. | Localities | Distance to Nearest Urban Center (km) | Local Resources |
|----------|------------------|---------------------------------------|---|
| 1 | Dragalina | 22 (Slobozia) | Close to the A2 highway; agricultural land |
| 2 | Nicolae Balcescu | 12,4 (Lehliu-Gara); 70 (Bucharest) | Close to A2 highway; agricultural land; railway access |
| 3 | Soldanu | 20 km (Oltenita); 47 (Bucharest) | Near National Road 4 (access with Bulgaria); agricultural land; railway access; lake (recreation) |
| 4 | Sarulesti | 21 (Fundulea); 26 (Lehliu-Gara) | Near the A2 highway; agricultural land; lake (recreation) |
| 5 | Sanmihaiu | 12 (Timisoara) | Bega river, agricultural land |
| 6 | Valcani | 20 (Sannicolau Mare) | Agricultural land, close to the border with Hungary and Serbia |
| 7 | Peciu Nou | 21 (Timisoara) | Agricultural land, lake (recreation) |
| 8 | Fardea | 90 (Deva); 88 (Timisoara) | Agricultural land, hills, natural lake, cultural buildings |

Source: data centered using Google Earth.

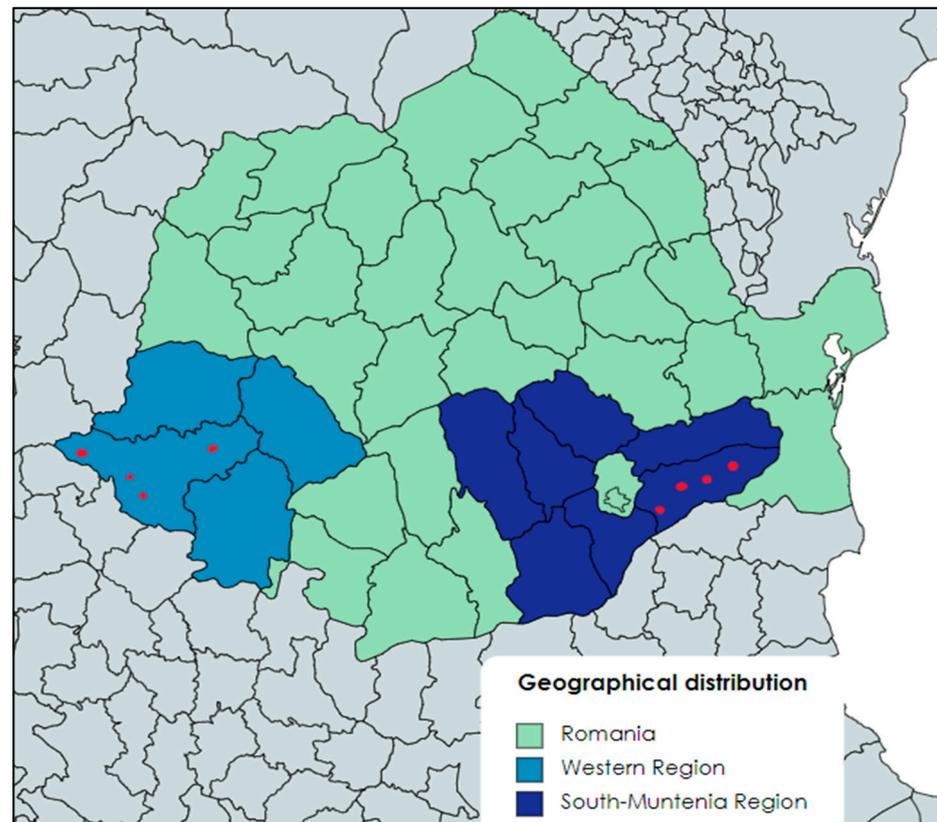


Figure 3. Territorial distribution of the analyzed localities. Source: geographical distribution using the MapChart application.

The data centralized as a result of the responses received from local authorities were processed using the statistical program SPSS version 27, thus determining the average and annual rate, and linear regression was performed. In addition, the establishment of links between variables and the simulation of the population evolution was carried out using the Ven-sim PLE program, based on the following relationship (Figure 4):

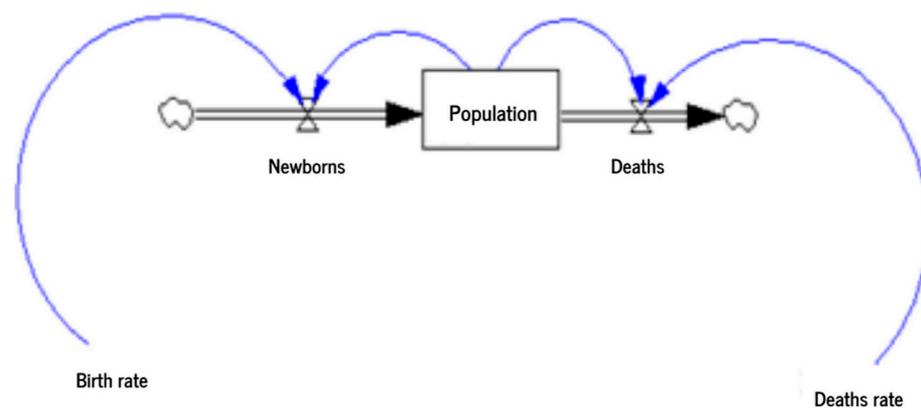


Figure 4. The relationship established between the variables through the Vensim simulation program. Source: data processing from the local authorities.

4. Results and Discussion

4.1. Results of Socio-Economic Analysis of Rural Localities Determined in Calarasi County

4.1.1. Case Study 1. Dragalina Locality

Analyzing the data provided by local authorities in Dragalina, Calarasi county, the population decreased slightly in the period of 2015–2020, with 2.71% fewer inhabitants in

2020 compared to the number recorded in 2015. Despite the decrease in the population number, the number of households in the commune registered an evolution of 4.66%, and the annual growth rate was at a low level, at only 0.9% (Table 3).

The birth rate in Dragalina commune remained low compared to the mortality rate, where on average around 77 people lost their lives annually. The persons receiving social assistance in Dragalina commune decreased, registering a decrease of 47.37% registered in 2020 compared to the number of persons benefiting from such support in 2015. The annual average of the persons receiving social aid was 172 people, with a negative annual rate of 12% (Table 4).

Table 4. Analysis of the evolution of the main demographic indicators in Dragalina commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 8775 | 8629 | 8537 | 8560 | 8427 | 8537 | −2.71 | 8578 | −0.5 |
| Households (no.) | 3303 | 3358 | 3465 | 3444 | 3519 | 3457 | 4.66 | 3424 | 0.9 |
| Birth rate (no. of newborns) | 2 | 1 | 0 | 0 | 1 | 0 | - | 1 | - |
| Mortality (no. deaths) | 84 | 79 | 76 | 75 | 68 | 78 | −7.14 | 77 | −1.5 |
| No. persons receiving social assistance | 209 | 208 | 207 | 172 | 128 | 110 | −47.37 | 172 | −12.0 |
| No. dispensaries/medical units | 4 | 4 | 4 | 4 | 4 | 4 | 0.00 | 4 | 0.0 |

Source: data processing obtained from local authorities.

In Dragalina commune, the number of medical units was constant, at four (Table 4).

An important indicator regarding the rural development of Dragalina commune in Calarasi county is represented by the number of economic agents registered in the local community. From 2015 to 2020, the number of economic agents increased by 98.1%, registering an annual rate of 14.7%. In 2020, there were 420 economic agents registered at the commune level, of which 197 were economic agents with an agricultural profile, representing 46.9% of the total economic agents. This distribution of economic agents present in Dragalina commune indicates that the economic activities were diverse and almost half of the economic agents carried out agricultural activities (Table 5).

Table 5. Analysis of the evolution of the main economic indicators in Dragalina commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|--|------|------|------|------|------|------|------|-------|---------------|
| Number of economic agents (companies, SRL, PFA, IL, etc.), of which: | 212 | 264 | 316 | 368 | 400 | 420 | 98.1 | 330.0 | 14.7 |
| Agricultural profile | 170 | 173 | 181 | 185 | 191 | 197 | 15.9 | 182.8 | 3.0 |
| Tourist units (including agrotourism units) | 0 | 0 | 0 | 0 | 0 | 0 | - | 0.0 | - |

Source: data processing obtained from local authorities.

In the period 2018–2020, the water supply for the population of Dragalina improved. Thus, in 2020 the water network covered 61.8 km out of a need of 80 km, with the existing network covering 77.3% of the need (Table 5).

On the other hand, in terms of the sewerage network, it remained at the same level throughout the analyzed period, covering 12% of the 80 km needed to fully cover the needs of the local community (Table 5).

We can say that of all the independent variables, the number of deaths had the highest impact on the dependent variable, with a beta value of 0.333, so the population was influenced by the number of deaths. However, we noted that the other variables, which showed negative values of the beta coefficient, showed us that when the population decreased, the number of households and economic agents increased (Table 6).

Table 6. The main indicators, using linear regression, Dragalina commune.

| Model 1 | R | R-Square | Std. Error of the Estimate | F-Change |
|---------------------------|--------|------------|----------------------------|----------|
| | 0.986 | 0.971 | 31.117 | 22.707 |
| Independent variable | B | Std. Error | Beta | t |
| No. deaths | 7.340 | 6.574 | 0.333 | 1.117 |
| Households (no.) | −0.849 | 0.653 | −0.575 | −1.299 |
| Number of economic agents | −0.164 | 0.400 | −0.114 | −0.410 |

Source: data processing from the mayor's office through the SPSS statistical program.

In addition, the beta coefficient (−0.575) regarding the independent variable “no. households” had a high impact on the dependent variable, so we can say that the population was influenced by the number of households. In this case study, it can be explained by the fact that the households owned by the elderly were divided by their children, who built their houses (households) near the parental home, being the place where they laid the foundations of a family (Table 6).

If the data, based on which the values were entered into the Vensim simulation program, remain constant, we can say that within 10 years the population of Dragalina will register a significant decrease, reaching a number of approximately 7800 inhabitants (Figure 5).

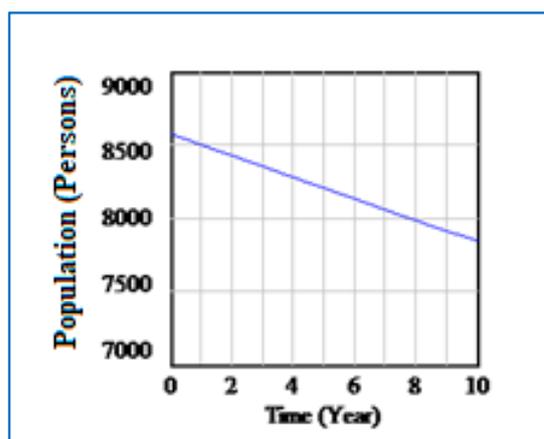


Figure 5. The result of the simulation regarding the evolution of the population in Dragalina over a period of 10 years. Source: data processing from the local authorities.

4.1.2. Case Study 2. Nicolae Balcescu Locality

Analyzing the data provided by the local authorities from Nicolae Balcescu commune, from Calarasi county, the population registered a slight decrease in the period 2015–2020, with 3.80% fewer inhabitants in 2020 compared to the number in 2015. Despite the decrease in the population, the number of households in the commune registered a slight evolution of 3.29%, and the annual growth rate was at a low level, at only 0.6% (Table 7).

The birth rate in Nicolae Balcescu commune remained low compared to the mortality rate, where on average, annually, around 32 people lost their lives. On average, 18 children were born annually in Nicolae Balcescu commune. The number of people benefiting from social assistance in Nicolae Balcescu commune decreased, registering a decrease of 73.17% in 2020 compared to the number of persons benefiting from such support in 2015. Annually, the average of persons benefiting from social assistance was 24 people, with a negative annual rate of 23.1%. The number of people receiving social assistance represented a percentage of 0.7% from the total number of inhabitants (Table 7).

Table 7. Analysis of the evolution of the main demographic indicators in Nicolae Balcescu commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 1631 | 1620 | 1598 | 1584 | 1572 | 1569 | −3.80 | 1596 | −0.8 |
| Households (no.) | 760 | 760 | 771 | 771 | 781 | 785 | 3.29 | 771 | 0.6 |
| Birth rate (no. of newborns) | 18 | 15 | 20 | 19 | 22 | 12 | −33.33 | 18 | −7.8 |
| Mortality (no. deaths) | 29 | 37 | 34 | 31 | 25 | 35 | 20.69 | 32 | 3.8 |
| No. persons receiving social assistance | 41 | 36 | 26 | 16 | 12 | 11 | −73.17 | 24 | −23.1 |
| No. dispensaries/medical units | 1 | 1 | 1 | 1 | 1 | 1 | 0.00 | 1 | 0.0 |

Source: data processing obtained from local authorities.

In Nicolae Balcescu commune, the number of medical units was constant, with only 1 such medical unit found (Table 7).

An important indicator regarding the commune of Nicolae Balcescu, in Calarasi county, is represented by the number of economic agents registered at the commune level. From 2015 to 2020, the number of economic agents increased by 58.8%, registering an annual rate of 9.7%. In 2020, the commune registered 27 economic agents, out of which 14 economic agents had an agricultural profile, representing 51.85% of the total economic agents. This distribution of the economic agents present in the commune indicates that the economic activities carried out by the inhabitants were mainly agricultural (Table 8).

Table 8. Analysis of the evolution of the main economic indicators in Nicolae Balcescu commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|--|------|------|------|------|------|------|------|------|---------------|
| Number of economic agents (companies, SRL, PFA, IL, etc.), of which: | 17 | 21 | 22 | 23 | 27 | 27 | 58.8 | 22.8 | 9.7 |
| Agricultural profile | 9 | 13 | 14 | 14 | 14 | 14 | 55.6 | 13.0 | 9.2 |
| Tourist units (including agritourism) | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - |

Source: data processing obtained from local authorities.

Comparing the number of inhabitants to the number of economic agents registered in Nicolae Balcescu commune, it was found that there was one economic agent per 58.1 inhabitants, a fairly high proportion, which reflects the need to promote the development of local businesses and the evolution of the number of economic agents to cover the necessary job needs (Table 8).

Taking into account the criterion for which this locality was chosen, a mathematical model was created using linear regression to observe the relationship between the factors that can influence, in this case, the population. To determine the mathematical model, independent variables were selected, which were closely related to the independent variable, according to the table below (Table 9).

Table 9. The main indicators, using linear regression, Nicolae Balcescu commune.

| Model 2 | R | R-Square | Std. Error of the Estimate | F-Change |
|-------------------------------------|--------|------------|----------------------------|----------|
| | 0.999 | 0.999 | 1.541 | 456.226 |
| Independent variable | B | Std. Error | Beta | t |
| Households (no.) | −0.364 | 0.213 | −0.148 | −1.709 |
| Number of socially assisted persons | 1.540 | 0.181 | 0.770 | 8.487 |
| Number of economic agents | −0.625 | 0.578 | −0.094 | −1.082 |

Source: data processing from the local authorities through the SPSS statistical program.

In order to establish the intensity of the connection between the variables, the coefficient R^2 was determined, in this case with a value of 0.999, which indicates that the dependent variable (population) was explained in a proportion of 99.9% by the independent variables (no. households, number of persons receiving social assistance, and number of economic agents) (Table 9).

We can say that, of all the independent variables, the number of people receiving social assistance had the highest impact on the dependent variable, with a beta value of 0.770, so the population was influenced by the number of people receiving social assistance. We noted that, although the number of inhabitants tended to decrease, the same was true for people receiving social assistance, being directly proportional, which can be explained by the fact that in an aging population, usually the people benefitting from this help are elderly or have health problems (Table 9).

In addition, the beta coefficient (-0.148) regarding the independent variable “no. of households” had a high impact on the dependent variable, so we can say that the population was influenced by the number of households, being inversely proportional. In this case study, we can explain that once the population tended to decrease, the number of households increased. Basically, the households of the elderly who died were inherited by their children, who chose not to sell them (for reasons of attachment) or had no one to sell them, but the newly founded families chose to build new households (Table 9).

If the data on the basis of which the values were introduced in the Vensim simulation program remain constant, we can say that within 10 years the population of Nicolae Balcescu will register a significant decrease, reaching approximately 1400 inhabitants (Figure 6).

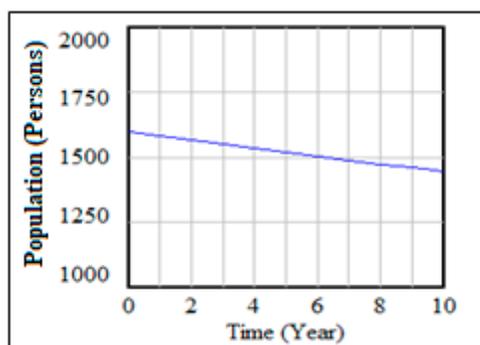


Figure 6. The result of the simulation regarding the evolution of the population in Nicolae Balcescu for a period of 10 years. Source: data processing from the local authorities.

4.1.3. Case Study 3. Soldanu Locality

In Soldanu commune, no births were registered in the period analyzed. Regarding the number of deceased persons, a downward trend was registered in 2020 compared to 2015, with a decrease of 28.81%. On average, in the analyzed period, 43 people died every year (Table 10).

Table 10. Analysis of the evolution of the main demographic indicators in Soldanu commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 3280 | 3290 | 3300 | 3300 | 3310 | 3320 | 1.22 | 3300 | 0.2 |
| Households (no.) | 1432 | 1470 | 1491 | 1520 | 1531 | 1544 | 7.82 | 1498 | 1.5 |
| Birth rate (no. of newborns) | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - |
| Mortality (no. deaths) | 59 | 38 | 47 | 46 | 28 | 42 | -28.81 | 43 | -6.6 |
| No. persons receiving social assistance | 190 | 203 | 220 | 240 | 240 | 229 | 20.53 | 220 | 3.8 |
| No. dispensaries/medical units | 1 | 1 | 1 | 1 | 1 | 1 | 0.00 | 1 | 0.0 |

Source: data processing obtained from local authorities.

The persons receiving social assistance in Soldanu commune increased in the analyzed period, with an evolution of 20.53% registered in 2020 compared to the number of persons benefiting from such support in 2015. The annual average of persons who benefitted from social assistance was 220 people, with a positive annual rate of 3.8%. The number of people receiving social assistance represented a percentage of 6.89% of the total number of inhabitants (Table 10).

In Soldanu commune, the number of medical units was constant, with only one such medical unit found at the commune level. Relating the population to the number of medical units in the commune, it can be seen that the only existing medical unit served almost 3320 people (Table 10).

An important indicator regarding the Soldanu commune, in Calarasi county, is represented by the number of economic agents that carried out their activity in the commune. From 2015 to 2020, the number of economic agents registered an upward trend. In 2020, the commune registered 135 economic agents, of which only six economic agents had an agricultural profile, representing 4.44% of the total economic agents. This distribution of the economic agents present in Soldanu commune indicates that there was a diversification of economic activities, and the share of agricultural activities was insignificant. In the commune, no tourist unit was registered (Table 11).

Table 11. Analysis of the evolution of the main economic indicators in Soldanu commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|--|------|------|------|------|------|------|------|-------|---------------|
| Number of economic agents (companies, SRL, PFA, II, etc.), of which: | 80 | 87 | 93 | 117 | 120 | 135 | 68.8 | 105.3 | 11.0 |
| Agricultural profile | 4 | 4 | 4 | 4 | 6 | 6 | 50.0 | 4.7 | 8.4 |
| Tourist units (including agritourism) | - | - | - | - | - | - | - | - | - |

Source: data processing obtained from local authorities.

Comparing the number of inhabitants to the number of economic agents registered in Soldanu commune, it was found that there was one economic agent per 24.59 inhabitants—a good proportion, given that we are talking about a commune located in the southern part of Romania, where the diversification of agricultural activities is significant (Table 11).

In order to establish the intensity of the connection between the variables, the coefficient R^2 was determined—in this case, with value of 0.929, which indicates that the dependent variable (no. of economic agents) was explained in proportion of 92.9% by the variables independent (population, no. of households and no. of persons receiving social assistance) (Table 12).

Table 12. The main indicators, using linear regression, Soldanu commune.

| Model 3 | R | R-Square | Std. Error of the Estimate | F-Change |
|-------------------------------------|--------|------------|----------------------------|----------|
| | 0.964 | 0.929 | 9.182 | 8.670 |
| Independent variable | B | Std. Error | Beta | t |
| Population (no.) | −0.432 | 1.612 | −0.281 | −0.268 |
| Households (no.) | 0.853 | 0.862 | 1.654 | 0.989 |
| Number of socially assisted persons | −0.495 | 0.867 | −0.464 | −0.571 |

Source: data processing from the local authorities through the SPSS statistical program.

We can say that of all the independent variables, the number of households had the highest impact on the dependent variable, with a beta value of 1654, so the number of economic agents was influenced by the number of households. It is noted that, while the number of households increases, the same happened with the number of economic agents, with the variables being directly proportional. We noted that although the number

of deaths was high, the population seemed to remain constant, which can be explained by the fact that the town managed to attract people from other towns who wanted to start economic activities due to the location of the commune, being located halfway between Bucharest and Oltenita (near the Danube River) (Table 12).

In addition, the beta coefficient (-0.464) regarding the independent variable "no. of people receiving social assistance" had a high impact on the dependent variable, so we can say that the number of economic agents was influenced by the number of people receiving social assistance, being inversely proportional. By increasing the number of economic agents, jobs are created, to which the persons belonging to this category can be introduced (Table 12).

If the data on the basis of which the values were introduced in the Vensim simulation program remain constant, we can say that within 10 years the population of Soldanu will register a significant decrease, reaching approximately 2900 inhabitants (Figure 7).

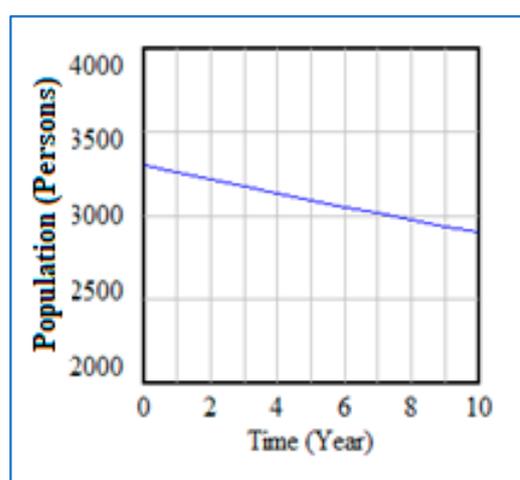


Figure 7. The result of the simulation regarding the evolution of the population in Soldanu for a period of 10 years. Source: data processing from the local authorities.

4.1.4. Case Study 4. Sarulesti Locality

The number of inhabitants in Sarulesti commune, in Calarasi county, registered a slight decrease of 0.28% in 2020 compared to 2015. The average population in the five years was 3214 inhabitants. In addition, against the background of the slight decrease in the number of inhabitants, the number of households in the commune registered an evolution of 9.30%, and the annual growth rate was positive, at 1.8%. Relating the number of inhabitants to the number of households in the commune, it was found that 2.85 people lived in a household (Table 13).

Table 13. Analysis of the evolution of the main demographic indicators in Sarulesti commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 3230 | 3205 | 3201 | 3215 | 3210 | 3221 | −0.28 | 3214 | −0.1 |
| Households (no.) | 1032 | 1025 | 1140 | 1137 | 1133 | 1128 | 9.30 | 1099 | 1.8 |
| Birth rate (no. of newborns) | 7 | 6 | 3 | 2 | 4 | 5 | −28.57 | 5 | −6.5 |
| Mortality (no. deaths) | 34 | 35 | 30 | 41 | 37 | 33 | −2.94 | 35 | −0.6 |
| No. persons receiving social assistance | 191 | 163 | 149 | 126 | 108 | 150 | −21.47 | 148 | −4.7 |
| No. dispensaries/medical units | 2 | 2 | 2 | 2 | 2 | 2 | 0.00 | 2 | 0.0 |

Source: data processing obtained from local authorities.

In Sarulesti commune, in the five years analyzed, the birth rate registered a significant decrease. In 2020 28.57% fewer children were born than in 2015. Regarding the number of deceased persons, a downward trend was registered in 2020 compared to 2015, with a decrease of 2.94%. On average, 35 people died per year during the analyzed period. Analyzing comparatively the number of newborns with the number of people who lost their lives in 2020, it was found that the number of deceased persons was six times higher than that of newborns (Table 13). The persons receiving social assistance in Sarulesti commune decreased in the analyzed period, registering in 2020 a decrease of 21.45% compared to the number of persons benefitting from such support in 2015. The annual average of persons benefitting from social assistance was 148 people, with a negative annual rate of 4.7%. The number of people receiving social assistance represented a percentage of 4.65% of the total number of inhabitants (Table 13). In Sarulesti commune the number of medical units was constant, with two such medical units at the commune level. Relating the population to the number of medical units in the commune, it can be seen that one medical unit served almost 1610 people (Table 13).

The number of economic agents operating in the commune of Sarulesti is an important indicator. From 2015 to 2020, the number of economic agents registered an upward trend. In 2020, the commune registered 27 economic agents, out of which only seven economic agents had an agricultural profile, representing 25.92% of the total economic agents. This distribution of the economic agents present in Sarulesti commune indicates that there was a diversification of economic activities, and the share of agricultural activities was not significant. In 2020, there were four tourist units in the commune. The existence of these tourist units can be attributed to the fact that fishing activities take place in this commune (Table 14).

Table 14. Analysis of the evolution of the main economic indicators in Sarulesti commune (CL) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|--|------|------|------|------|------|------|------|------|---------------|
| Number of economic agents (companies, SRL, PFA, II, etc.), of which: | 22 | 23 | 25 | 27 | 27 | 27 | 22.7 | 5.2 | 4.2 |
| Agricultural profile | 7 | 7 | 7 | 7 | 7 | 7 | - | 7.0 | 0.0 |
| Tourist units (including agritourism) | 2 | 2 | 3 | 4 | 4 | 4 | - | - | - |

Source: data processing obtained from local authorities.

Relating the number of inhabitants to the number of economic agents registered in Sarulesti commune, it was found that there was one economic agent per 119.29 inhabitants (Table 14).

In order to establish the intensity of the connection between the variables, the coefficient R² was determined—in this case, with value of 0.985, which indicates that the dependent variable (no. economic agents) was explained in a proportion of 98.5% by independent variables (no. of households, no. of persons receiving social assistance, and number of tourist units) (Table 15).

Table 15. The main indicators, using linear regression, Sarulesti commune.

| Model 4 | R | R-Square | Std. Error of the Estimate | F-Change |
|---|--------|------------|----------------------------|----------|
| | 0.993 | 0.985 | 0.430 | 44.205 |
| Independent variable | B | Std. Error | Beta | t |
| Households (no.) | 0.002 | 0.008 | 0.055 | 0.283 |
| No. persons receiving social assistance | −0.011 | 0.012 | −0.143 | −0.922 |
| Tourist units (including agritourism) | 1.860 | 0.507 | 0.820 | 3.665 |

Source: data processing from the local authorities through the SPSS statistical program.

We can say that of all the independent variables, the number of tourist units had the highest impact on the dependent variable, with a beta value of 0.820, so the number of economic agents was influenced by the number of tourist units. It was noted that the two variables were directly proportional, so when the number of economic agents increased, there was an increase in tourist units. The fact that the Sarulesti locality benefits from favorable conditions for the establishment of these types of economic activities is also reflected by the total number of economic agents at the locality level (Table 15).

In addition, the beta coefficient (-0.143) regarding the independent variable “no. people receiving social assistance” had a high impact on the dependent variable, so we can say that the number of economic agents was influenced by the number of people receiving social assistance, being inversely proportional. By increasing the number of economic agents, jobs are created to which the persons belonging to this category can be introduced (Table 15).

If the data based on which the values were entered in the Vensim simulation program remain constant, we can say that within 10 years the population of Sarulesti will register a significant decrease, reaching approximately 2900 inhabitants (Figure 8).

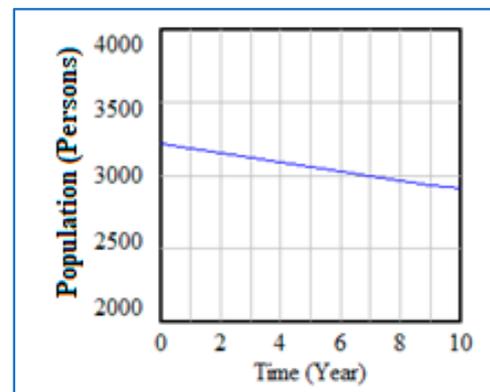


Figure 8. The result of the simulation regarding the evolution of the population in Sarulesti for a period of 10 years. Source: data processing from the local authorities.

4.2. Results of Socio-Economic Analysis of Rural Localities Determined in Timis County

4.2.1. Case Study 5. Sanmihaiu Roman Locality

The number of inhabitants in Sanmihaiu Roman commune in Timis county registered a slight increase of 9.43% in 2020 compared to 2015. The average population over the five years was 8671 inhabitants. The number of households in the commune also registered a significant evolution in 2020 compared to the number registered in 2015, at 70.42%, and the annual growth rate was positive, at 11.3%. Relating the number of inhabitants to the number of households in the commune, it was found that 2.19 people lived in a household (Table 16).

Table 16. Analysis of the evolution of the main demographic indicators in Sanmihaiu Roman (TM) commune in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 8215 | 8452 | 8452 | 9006 | 8912 | 8990 | 9.43 | 8671 | 1.8 |
| Households (no.) | 2404 | 3450 | 3632 | 3632 | 3944 | 4097 | 70.42 | 3527 | 11.3 |
| Birth rate (no. of newborns) | 95 | 92 | 114 | 105 | 116 | 107 | 12.63 | 105 | - |
| Mortality (no. deaths) | 49 | 37 | 43 | 41 | 54 | 53 | 8.16 | 46 | 1.6 |
| No. persons receiving social assistance | 25 | 35 | 31 | 20 | 19 | 18 | -28.00 | 25 | -6.4 |
| No. dispensaries/medical units | 4 | 4 | 4 | 4 | 4 | 4 | 0.00 | 4 | 0.0 |

Source: data processing obtained from local authorities.

In Sanmihaiu Roman commune in the five years analyzed, the birth rate registered a significant evolution. In 2020 12.63% more children were born than in 2015. Regarding the number of deceased persons, an ascending trend was registered in 2020 compared to 2015, at an evolution of 8.16%. On average, 46 people per year died during the analyzed period. Analyzing the number of newborns compared to the number of people who lost their lives in 2020, it was found that the number of newborns was two times higher than the number of people who lost their lives (Table 16).

The persons receiving social assistance in Sanmihaiu Roman commune decreased in the analyzed period, with a 28% decrease registered in 2020 compared to the number of persons benefiting from such support in 2015. Annual average of persons benefit from social assistance is 25 people, with a negative annual rate of 6.4%. The number of people receiving social assistance represents a percentage of 0.20% of the total number of inhabitants (Table 16).

In Sanmihaiu Roman commune, the number of medical units was constant, with four in the commune. Relating the population to the number of medical units in the commune, it can be seen that one medical unit served almost 2247 people (Table 16).

The number of economic agents operating in Sanmihaiu Roman commune is an important indicator. From 2015 to 2020, the number of economic agents registered an upward trend. In 2020, the commune registered 552 economic agents, out of which only 10 economic agents had an agricultural profile, representing 1.81% of the total economic agents. This distribution of the economic agents present in Sanmihaiu Roman commune indicates that there was a diversification of economic activities, and the share of agricultural activities was insignificant. In 2020 there was only one tourist unit in the commune (Table 17).

Table 17. Analysis of the evolution of the main economic indicators in Sanmihaiu (TM) commune in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|--|------|------|------|------|------|------|------|-------|---------------|
| Number of economic agents (companies, SRL, PFA, II, etc.), of which: | 323 | 436 | 445 | 474 | 527 | 552 | 70.9 | 486.8 | 11.3 |
| Agricultural profile | 8 | 9 | 10 | 10 | 10 | 10 | 25.0 | 9.5 | 4.6 |
| Tourist units (including agritourism) | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - |

Source: data processing obtained from local authorities.

Comparing the number of inhabitants to the number of economic agents registered in Sanmihaiu Roman commune, it was found that there was one economic agent per 16.28 inhabitants (Table 17).

In order to establish the intensity of the link between the variables, the coefficient R² was determined—in this case, with value of 0.908, which indicates that the dependent variable (population) was explained in a proportion of 90.8% by the independent variables (no. of households, number of persons receiving social assistance, and number of economic agents) (Table 18).

Table 18. The main indicators, using linear regression, Sanmihaiu Roman commune.

| Model 5 | R | R-Square | Std. Error of the Estimate | F-Change |
|---|---------|------------|----------------------------|----------|
| | 0.953 | 0.908 | 163.124 | 6.548 |
| Independent variable | B | Std. Error | Beta | t |
| Households (no.) | 0.308 | 0.328 | 0.543 | 0.941 |
| No. persons receiving social assistance | −25.356 | 11.238 | −0.523 | −2.256 |
| Economic agents with agricultural profile | 39.181 | 237.383 | 0.097 | 0.165 |

Source: data processing from the local authorities through the SPSS statistical program.

We can say that of all the independent variables, the number of households had the highest impact on the dependent variable, with a beta value of 543, so the population was influenced by the number of households. It was noted that the two variables were directly proportional, so as the population grew there was an increase in households (Table 18).

In addition, the beta coefficient (-0.523) regarding the independent variable “no. people receiving social assistance” had a high impact on the dependent variable, so we can say that the population was influenced by the number of people receiving social assistance, being inversely proportional (Table 18).

If the data based on which the values were introduced in the Vensim simulation program remain constant, we can say that within 10 years the population of Sanmihaiu Roman will register a significant increase, reaching approximately 9250 inhabitants (Figure 9).

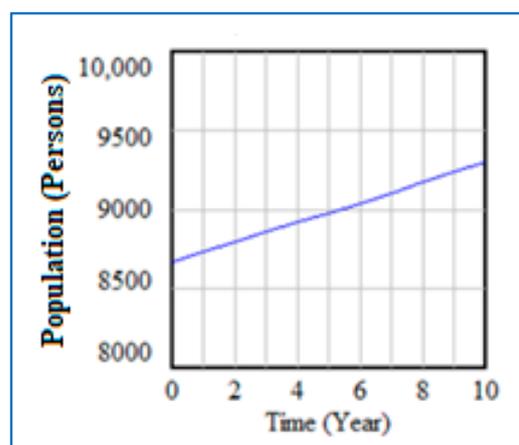


Figure 9. The result of the simulation regarding the evolution of the population in Sanmihaiu for a period of 10 years. Source: data processing from the local authorities.

4.2.2. Case Study 6. Valcani Locality

The number of inhabitants in Valcani commune from Timis county registered a slight decrease of 0.94% in 2020 compared to 2015. The average population in the five-year period was 1379 inhabitants. Regarding the number of households in the commune, it remained constant in the analyzed period (2015–2020), with 534 households. Relating the number of inhabitants to the number of households in the commune, it was found that there were 2.56 people per household (Table 19).

Table 19. Analysis of the evolution of the main demographic indicators in Valcani commune (TM) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 1385 | 1390 | 1380 | 1374 | 1370 | 1372 | −0.94 | 1379 | −0.2 |
| Households (no.) | 534 | 534 | 534 | 534 | 534 | 534 | 0.00 | 534 | 0.0 |
| Birth rate (no. of newborns) | 11 | 14 | 9 | 6 | 13 | 13 | 18.18 | 11 | 3.4 |
| Mortality (no. deaths) | 18 | 15 | 16 | 12 | 9 | 15 | −16.67 | 14 | −3.6 |
| No. persons receiving social assistance | 1 | 0 | 0 | 0 | 0 | 0 | - | - | - |
| No. dispensaries/medical units | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - |

Source: data processing obtained from local authorities.

In Valcani commune, in the five-year analyzed period the birth rate registered an evolution. In 2020 18.18% more children were born than in 2015. Regarding the number of deceased persons, a downward trend was registered in 2020 compared to 2015, with a decrease of 16.67%. On average, 14 people died per year during the analyzed period. Analyzing the number of newborns compared to the number of people who lost their lives

in 2020, it was found that the number of newborns was exceeded by the number of people who lost their lives (Table 19).

In the commune of Valcani in Timis county, in the analyzed period there was only one person with social assistance in 2015; after this year there was no other beneficiary of social benefits (Table 19).

In Valcani commune, the number of medical units was constant, with only one such medical unit. Relating the population to the number of medical units in the commune, it can be seen that one medical unit served 1372 people (Table 19).

The number of economic agents operating in Valcani commune is an important indicator. From 2015 to 2020, the number of economic agents registered a slight evolution. In 2020, the commune registered 10 economic agents, half of whom were represented by economic agents that had an agricultural profile, indicating a significant share of agricultural activities carried out in the analyzed area (Table 20).

Table 20. Analysis of the evolution of the main economic indicators in Valcani commune (TM) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|------|------|---------------|
| Number of economic agents (companies, SRL, PFA, IL, etc.) of which: | 9 | 10 | 10 | 10 | 10 | 10 | 11.1 | 9.8 | 2.1 |
| Agricultural profile | 4 | 5 | 5 | 5 | 5 | 5 | 25.0 | 4.8 | 4.6 |
| Tourist units (including agritourism) | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - |

Source: data processing obtained from local authorities.

Comparing the number of inhabitants to the number of economic agents registered in Valcani commune, it is found that there was one economic agent per 137.2 inhabitants, which indicates an insufficient development of economic activities at the commune level and a possible lack of jobs (Table 20).

In order to establish the intensity of the link between the variables, the coefficient R² was determined—in this case, with a value of 0.462, which indicates that the dependent variable (population) was explained in a proportion of 46.2% by the independent variables (number of deaths and the number of economic agents) (Table 21).

Table 21. The main indicators, using linear regression, Valcani commune.

| Model 6 | R | R-Square | Std. Error of the Estimate | F-Change |
|---------------------------|--------|------------|----------------------------|----------|
| | 0.679 | 0.462 | 7.476 | 1.286 |
| Independent variable | B | Std. Error | Beta | t |
| Mortality (no. deaths) | 1.675 | 1.298 | 0.677 | 1.291 |
| Number of economic agents | −0.096 | 10.134 | −0.005 | −0.010 |

Source: data processing from the local authorities through the SPSS statistical program.

We can say that of all the independent variables, the number of deaths had the highest impact on the dependent variable, with a beta value of 0.677, so the population was influenced by the number of deaths. It was noted that the two variables were directly proportional (Table 21).

If the data on the basis of which the values were introduced in the Vensim simulation program remain constant, we can say that within 10 years the population of Valcani will decrease, reaching approximately 1350 inhabitants (Figure 10).

4.2.3. Case Study 7. Peciu Nou Locality

Peciu Nou commune in Timis county is composed of Dinias, Peciu Nou (residence), and Sanmartinu Sarbesc villages. Regarding the population, in this commune the trend increased slightly, registering 5.34% more inhabitants in 2020 than in 2015. The annual

average population in the analyzed period was 5567 inhabitants, and the growth rate was positive one, at 1% (Table 22).

Table 22. Analysis of the evolution of the main demographic indicators at the level of Peciu Nou (TM) commune in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|------|---------------|
| Population (no inhabitants) | 5412 | 5490 | 5591 | 5591 | 5615 | 5701 | 5.34 | 5567 | 1.0 |
| Households (no.) | 2040 | 2040 | 2040 | 2147 | 2149 | 2224 | 9.02 | 2107 | 1.7 |
| Birth rate (no. of newborns) | 37 | 58 | 49 | 42 | 28 | 45 | 21.62 | 43 | 4.0 |
| Mortality (no. deaths) | 47 | 46 | 45 | 42 | 50 | 48 | 2.13 | 46 | 0.4 |
| No. persons receiving social assistance | 13 | 16 | 15 | 13 | 13 | 11 | −15.38 | 14 | −3.3 |
| No. dispensaries/medical units | 4 | 4 | 4 | 4 | 4 | 4 | 0.00 | 4 | 0.0 |

Source: data processing obtained from local authorities.

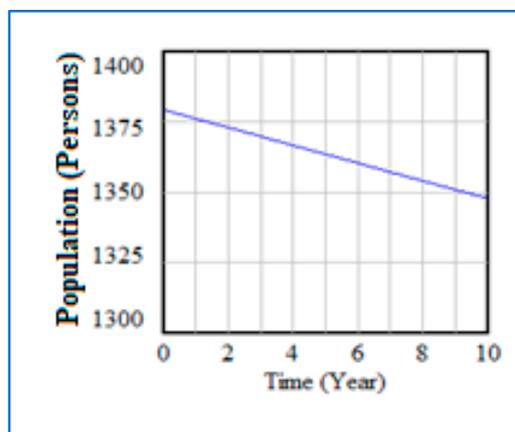


Figure 10. The result of the simulation regarding the evolution of the population in Valcani for a period of 10 years. Source: data processing from the local authorities.

From 2018 until 2020, the number of households in the commune of Peciu Nou registered a positive evolution, with an increase of 9.02% in the number of households in 2020 compared to the value registered in 2015. The average number of households in the period analyzed was 2107, and the annual rhythm was positive, at 1.7% (Table 22).

Regarding birth and mortality, the number of newborns in the commune fluctuated, registering a maximum in 2016, when 58 children were born, whereas the minimum registered was in 2019, when 28 children were born. In 2020, the number of newborns was 21.62% higher than the number registered in 2015, and the average number of newborns in the analyzed period was 43 children per year. Regarding the mortality indicator, the number of people who died in 2020 was 2.13% lower than the number of deaths recorded in 2015. The number of people who died in 2020 slightly exceeded the number of newborns (Table 22).

In Peciu Nou commune in 2020 a total of 11 people benefited from social aid, 15.38% less than the beneficiaries of social aid in 2015. Comparing the number of inhabitants to the number of social aid beneficiaries, it was noted that those who received social benefits represented 0.19% of the commune's population (Table 22).

In 2020, in the commune of Peciu Nou there were four medical units, and each unit served, on average, 1425 people (Table 22).

The number of economic agents from Peciu Nou commune registered an ascending trend in the analyzed period. Thus, if in 2015 there were 485 economic agents, in 2020 that number increased by 8.2%. The annual growth rate of the number of economic agents was positive, at 1.6%. Of the 525 economic agents existing in 2020, 45 of them had an agricultural profile, representing 8.5% of the total economic agents. This report indicates

that there was a diversification of the economic agents' activity, and agriculture was little represented at the level of existing economic agents in Peciu Nou commune (Table 23).

Table 23. Analysis of the evolution of the main economic indicators at the level of Peciu Nou (TM) commune in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|--------|-------|---------------|
| Number of economic agents (companies, SRL, PFA, IL, etc.) of which: | 485 | 490 | 494 | 497 | 501 | 525 | 8.2 | 498.7 | 1.6 |
| Agricultural profile | 18 | 25 | 30 | 34 | 40 | 45 | 150.0 | 32.0 | 20.1 |
| Tourist units (including agritourism) | 1 | 1 | 1 | 1 | 1 | 0 | −100.0 | 0.8 | - |

Source: data processing obtained from local authorities.

In order to establish the intensity of the link between the variables, the coefficient R2 was determined—in this case, with a value of 0.878, which indicates that the dependent variable (number of economic agents) was explained in a proportion of 87.8% by the independent variables (population, no. of households, and no. of economic agents with agricultural profile) (Table 24).

Table 24. The main indicators, using linear regression, Peciu Nou commune.

| Model 7 | R | R-Square | Std. Error of the Estimate | F-Change |
|---|--------|------------|----------------------------|----------|
| | | 0.937 | 0.878 | 7.764 |
| Independent variable | B | Std. Error | Beta | t |
| Population (no inhabitants) | 0.115 | 0.154 | 0.828 | 0.745 |
| Households (no.) | 0.128 | 0.117 | 0.714 | 1.095 |
| Economic agents with agricultural profile (no.) | −0.785 | 2.092 | −0.551 | −0.375 |

Source: data processing from the local authorities through the SPSS statistical program.

We can say that, of all the independent variables, the population had the highest impact on the dependent variable, with a beta value of 0.828, so the number of economic agents was influenced by the population. It was noted that the two variables were directly proportional, so when the number of economic agents increased, there was an increase in the population (Table 24).

If the data based on which the values were introduced in the Vensim simulation program remain constant, we can say that within 10 years the population of Peciu Nou will decrease, reaching approximately 5535 inhabitants (Figure 11).

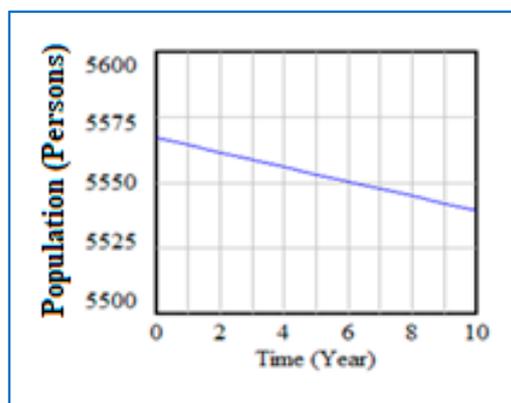


Figure 11. The result of the simulation regarding the evolution of the population in Peciu Nou for a period of 10 years. Source: data processing from the local authorities.

4.2.4. Case Study 8. Fardea Locality

Fardea commune in Timis county is composed of the villages of Dragsinesti, Fardea (residence), Gladna Montana, Gladna Romana, Hauzesti, Matnicu Mic, and Zolt. Regarding the population, in this commune the trend decreased slightly, registering 5.89% fewer inhabitants in 2020 than in 2015. The annual average population in the analyzed period was 1699 inhabitants and the annual rhythm was negative, at 1.2% (Table 25).

Table 25. Analysis of the evolution of the main demographic indicators in Fardea commune (TM) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|---|------|------|------|------|------|------|---------|------|---------------|
| Population (no inhabitants) | 1750 | 1742 | 1712 | 1680 | 1662 | 1647 | −5.89 | 1699 | −1.2 |
| Households (no.) | 543 | 544 | 546 | 550 | 551 | 552 | 1.66 | 548 | 0.3 |
| Birth rate (no. of newborns) | 12 | 10 | 11 | 10 | 9 | 7 | −41.67 | 10 | −10.2 |
| Mortality (no. deaths) | 21 | 23 | 23 | 34 | 18 | 25 | 19.05 | 24 | 3.5 |
| No. persons receiving social assistance | 2 | 1 | 2 | 1 | 2 | 0 | −100.00 | 1 | - |
| No. dispensaries/medical units | 1 | 1 | 1 | 1 | 1 | 1 | 0.00 | 1 | 0.0 |

Source: data processing obtained from local authorities.

From 2018 until 2020, the number of households in Fardea commune registered a positive evolution, with an increase of 1.66% in the number of households in 2020 compared to the value registered in 2015. The average number of households in the analyzed period was 548, and the rate was positive, at 0.3% (Table 25).

Regarding the birth and mortality rates, the number of newborns in the commune registered a significant decrease in 2020 compared to 2015, with 41.67% fewer newborns in 2020 compared to 2015. The average number of newborns in the analyzed period was 10. Regarding the mortality indicator, the number of people who died in 2020 was 19.05% higher than the number of deaths recorded in 2015. The number of deaths in 2020 was 3.5 times higher than the number of newborns. In Fardea commune in 2020, no one benefited from social assistance, whereas in 2019 two people received social assistance. In 2020, in the commune of Fardea there was only one medical unit, which served a total of 1647 inhabitants (Table 25).

Analyzing the data provided by local authorities, in 2020 there was no economic operator registered in the commune. During the analyzed period, it was noticed that in 2018 there were eight economic agents, of which two had an agricultural profile, and there were also three tourist units. Since in 2020 there was no registered economic agent, we can assume that those with an agricultural profile, as well as the tourist units, ceased their activities (Table 26).

Table 26. Analysis of the evolution of the main economic indicators in Fardea commune (TM) in the period 2015–2020.

| Specification | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % | Avr. | Annual Rhythm |
|--|------|------|------|------|------|------|--------|------|---------------|
| Number of economic agents (companies, SRL, PFA, IL, etc.), of which: | 5 | 5 | 1 | 8 | 2 | 0 | −100.0 | 3.5 | - |
| Agricultural profile | 0 | 5 | 1 | 2 | 1 | 0 | - | 1.5 | - |
| Tourist units (including agritourism) | 0 | 0 | 0 | 3 | 0 | 0 | - | - | - |

Source: data processing obtained from local authorities.

To establish the intensity of the link between the variables, the coefficient R2 was determined—in this case, with a value of 0.990, which indicates that the dependent variable (population) was explained in a proportion of 99.0% by the independent variables (no. households and no. newborns) (Table 27).

Table 27. The main indicators, using linear regression, Fardea commune.

| Model 8 | R | R-Square | Std. Error of the Estimate | F-Change |
|----------------------|---------|------------|----------------------------|----------|
| | 0.995 | 0.990 | 5.520 | 147.056 |
| Independent variable | B | Std. Error | Beta | t |
| Households (no.) | −10.585 | 1.152 | −0.953 | −9.189 |
| No. of newborns | 1.249 | 2.561 | 0.051 | 0.488 |

Source: data processing from the local authorities through the SPSS statistical program.

If the data on the basis of which the values were entered in the Vensim simulation program remain constant, we can say that within 10 years the population of Fardea will decrease, reaching approximately 1600 inhabitants (Figure 12).

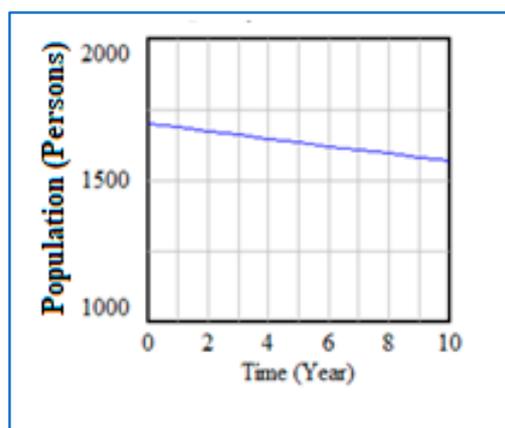


Figure 12. The result of the simulation regarding the evolution of the population in Fardea for a period of 10 years. Source: data processing from the local authorities.

5. Discussion

The aging population influences the high level of mortality in the localities analyzed, and there is a link between these two variables [62–64]. This highlights the high number of elderly inhabitants, more so as the number of deaths exceeds the birth rate, which is highlighted by the population trend over the next 10 years, which shows negative values. This hypothesis is therefore verified and proves true [65,66].

Drawing a parallel between the demographic situation of rural areas in Romania and other countries, Kasimis [67] presented in his paper that “demographic aging has been a major problem in rural areas of some Member States, especially in Spain, Greece, Portugal and France, where the rural population is made up of a higher proportion of people over the age of 65.” The study revealed a situation like the one facing our country, namely, that in the same countries mentioned above, there is a relatively low percentage of children compared to retirees, a low proportion of young adults compared to retirees, and a high overall dependency ratio (total population/ages 15–64).

At the EU level, about 17% of the rural population is already over the retirement age, and in countries such as Spain, France, Greece, and Portugal in particular, this share stands at 18–22%, which was also the case at the beginning of Romania’s accession [68].

Romania can be compared in many respects (similar agricultural area, similar past, Eastern Europe) with Poland. Analyzing the literature, we observed similarities in this phenomenon in the rural environment. Studies have shown that rural areas with a higher standard of living are often located along the most important transport routes. Additionally, the areas near big cities attract bigger investments. At the same time, the results of the study showed that in Poland, like in Romania, the standard of living in rural areas is very diverse, depending on the spatial distribution, industrialization, and urbanization. Rural

areas with economic and often social underdevelopment, with low development dynamics, appear in peripheral locations compared to the main urban network [69].

In all eight localities analyzed, the number of new births per population was extremely low [70]. This is due to the aging population and the low number of young people in these localities. The “lifestyle” factor, which is predominantly found in urban areas, was also evident in these rural areas, where young people are looking for ways to secure a better standard of living and are leaving their native villages [71].

An interesting aspect is the evolution of the number of households, which generally tended to increase [72]. Households of deceased people are usually taken over by legal heirs, who often choose not to return to their places of origin. Even if they would like to sell the household, due to the lack of demand for these households, they remain in a state of severe decay [73,74].

However, young people who still live in these rural areas prefer to build a new houses rather than live in the old ones. Thus, the number of such households tended to increase because old households remained and new ones appeared (if young people chose to stay in the villages) [75–77]. Clearly, there was an association between population and number of households, so H2 does hold.

The larger the population in the localities, the more the number of economic agents tended to increase to meet market needs [78]. However, this was also influenced to a large extent by the standard of living, which in rural areas is much lower than in urban areas [79,80].

As a rule, the economic activities existing at the local level do not create enough jobs, because to a large extent, these activities are service providers, mostly represented by bars, entertainment halls, shops, and betting shops, which are managed and run by a small staff [81]. In addition, large or very large agricultural activities are equipped with high-performance machinery and equipment, which do not require many staff, given that the cultivation of cereal and oilseed crops predominates in these two regions. In recent years, large companies (supermarkets and building materials) have entered the local market and tend to take over the normal economic activities of residents [82].

Insufficient funds at the disposal of local authorities, due to low contributions to the local budget both in terms of the reduced number of economic agents and the number of existing employees, are blocking local infrastructure development processes. Although European funds can be accessed, the lack of co-financing prevents them from being accessed [83,84]. Without adequate infrastructure, young people cannot be retained or attracted to rural areas. The exception is areas close to urban centers (peri-urban areas) where significant development is taking place [85,86].

All the localities analyzed have a minimal, partially developed local infrastructure, which limits the access of potential investors who can generate funds for the local budget and create new jobs [87].

The aging population and the lack of jobs are also reflected in the high number of people receiving social aid in relation to the population, but this aspect is characteristic of the analyzed localities in Calarasi county. In this case H4 is partially true, since in the case of the localities in Timis the links between the two variables were not strongly influenced.

6. Conclusions, Implications, and Limitations

The topic of this research has been and remains highly up to date, being debated by researchers around the world and drawing on both old and new policies applied at the European level. Its implications, so important from a social and economic point of view, continue to be relevant.

In some rural areas of some EU countries, socio-economic discrepancies may arise due to various factors, but in Romania these discrepancies are only found between rural areas close to cities and rural areas. At the regional level, whether the region is analyzed as a region with predominantly agricultural economic activities (South-Muntenia region,

Calarasi county) or with diversified activities (West region, Timis county), the rural area presents mostly the same characteristics.

The connections between internal and external factors that can contribute to the development of localities are extremely diverse. According to the localities analyzed, their geographical location limits their development in the sense that the distance to the nearest town is relatively far. The local resources available at local or regional level are mainly based on agricultural land.

The local economy has a direct influence on the population and local authorities. With a poorly developed economy, people tend to migrate to urban centers, depopulating rural areas, and local authorities lack funds to revitalize local infrastructure. Competition from large firms entering local markets also puts local activities at risk. In this way, instead of financial resources staying and circulating within the region, creating added value, they leave the locality or region [88–90].

It was found that the jobs are insufficient due to the fact that the local infrastructure is poorly developed and unable to attract external investors, but also due to the lack of entrepreneurship of the residents. At the same time, the generation of new jobs can contribute to the local economy and create conditions for retaining and attracting people to rural areas [90,91].

Taking into account all the elements analyzed, it can be concluded that the main factor that can change this pattern of rural localities is the local authorities and the government, which can encourage investment in these areas, either through the development of local and national infrastructure or through fiscal measures that encourage the development of quality non-agricultural activities that can generate financial resources and jobs at the local level.

However, the low number of non-agricultural activities is not the only factor causing the poor development of rural areas, nor is it the most important. Rather, it is the low number of economic agents in general and the quality of the types of activities undertaken, which cannot generate jobs. Economically viable family farms can contribute to the development of rural areas by functioning as an ecosystem.

In conclusion, rural areas have an interdependent relationship with both internal and external factors, where one variable is influenced by another, thus building a pattern that is difficult to break through to develop these rural areas.

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Limitations: We can consider the fact that the eight localities may not be statistically representative to extrapolate the situation at the national level for all localities, but we cannot notice the pattern that was found in seven of these localities, at a rate of 87.5%.

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