

THE POPULATION IN THE APUSENI MOUNTAINS AREA:
PAST, PRESENT AND PERSPECTIVES (1900–2030)

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ABSTRACT

Among the phenomena that drew attention to the Apuseni Mountains area, the population dynamics recorded over time has a prominent place. The present article carries out research regarding the evolution of this phenomenon over the last 110 years. The information the article relies upon was gathered from the censuses that were started in 1900 and continued in the years 1910, 1930, 1941, 1956, 1966, 1977, 1992 and 2011.

The problem that requires attention nowadays concerning the population of the Apuseni Mountains is the constant and gradual population decline, which registered different intensities in all villages of the area included in the perimeter. The period we analyze witnessed different types of intervals: some of them were characterized by significant increases in population, others by relative stagnations and the last ones (since the 1966 census) by a dramatic reduction in the number of inhabitants. The demographic decline which has taken place in the Apuseni Mountains area over the last 60 year has, among other consequences, that of modifying the age structure of the population in an unfavorable direction with regards to the population stability in the area on the medium and long term. The changes in the population structure have led, and will continue to do so, to acceleration in the demographic decline over time. As it stands, the prognosis for the year 2030 underlines an increasingly worrisome situation.

Keywords: population dynamics, demographic phenomena, depopulation, population age structure, demographic decline.

INTRODUCTION

On approximation, the mountainous regions in Romania occupy over a third of the total national territory (37,9%) and account for over 15,4% of the population in their 824 administrative centers (744 counties and 80 cities and municipalities),

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which include 3,580 villages (Rey, 2010, p. 86). Among them, the Apuseni Mountains area accounts for 15% of the mountain dwelling population, 22% of the agricultural land and 31% of cultivable area, with its 850 villages organized inside 122 communes (Plăiaș, 2013, p. 91). The extent of the mountain areas (*Table 1*), their role in Romania's economic and social life and, also, the number of people living there (*Table 2*), signify the importance of the region to any national development strategy.

Table 1

The number and total surface area of the counties included in the study

County	Number of communes	Total surface area (ha)	The county's share in the total surface area (%)	Cultivated surface area (ha)	The county's share in the total cultivated surface area (%)
Alba	37	303,235	27.0	129,611	26.1
Arad	13	137,836	12.3	46,768	9.4
Bihor	27	241,147	21.5	112,696	22.7
Cluj	20	232,234	20.6	120,197	24.2
Hunedoara	17	153,783	13.7	54,081	10.9
Sălaj	8	54,972	4.9	32,934	6.6
Total	122	1,123,207	100	496,287	100,0

The Apuseni Mountains area have been one of the earliest places with a human population, as it was proven in a significant number of studies, reports, dissertations and communications on the area and its population, which were written in several scientific domains (history, archeology, sociology, economy, biology, ethnographical studies, anthropology, medicine and linguistics).

What is specific to the Apuseni Mountain area is the extend of the human settlements up to 1,300–1,350 m altitude (Miftode, 1978) as a result of the gentle incline of the cliffs, which does not appear anywhere else in the Carpathian Mountains. This domestication of the mountain was initiated through *„deforestation, by needs and means, the result being a void, a clean place, used for creating a household and its dependencies, which then turned into pastures and cultivated areas. A more numerous family created another void, for another household and so, by successive steps a grove was created, which included all the members of the family with a common ancestor, common name, name that was then given to the location which turned into a village with a pastoral and forest based economy”* (Toth, 1965, p. 102).

Once all the available space has been occupied by the local population and the properties – called *„seșii”* became so fragmented that they couldn't sustain a household anymore, the population spilled out into the neighborhood areas, other regions of the country and, more recently, other countries.

Table 2

The total population of the counties included in the study (census of 2011)

County	Number of communes in the Apuseni Mountains area	County's total population (people)	Population in the Apuseni Mountains area / county (people)	The share of the population in the Apuseni Mountains area in the county's total population (%)	The county's share in the population in the Apuseni Mountains area (%)
Alba	37	342,376	86,161	25.2	28.0
Arad	13	430,629	23,185	5.4	7.5
Bihor	27	575,398	77,453	13.5	25.2
Cluj	20	691,106	57,086	8.3	18.5
Hunedoara	17	418,565	45,546	10.9	14.8
Sălaj	8	224,384	18,518	8.3	6.0
Total	122	2,682,458	307,949	11.5	100.0

Therefore, between the phenomena that represented the region over time, a special place was reserved to the study of the massive increase of the population in the Apuseni Mountains area over time. Eventually, the excess population was absorbed in other areas with a population deficit (Banat, the German areas, The Western Plain where some of the new villages took names found in the Apuseni area, such as Albacu Nou and Scărișoara Nouă) or industrialized areas where workforce was needed.

The excess population occurred even when the material situation of the inhabitants of the Apuseni area was very low. This behavior changed however overtime, and now the demography in the Apuseni Mountains area is in a completely different situation.

The problem that needs to be resolved today, regarding the population in the Apuseni Mountain area, is the constant and progressive population decline, which happened in the last decades at various intensities, by sub-zones and time intervals, in all the rural settlements in the region included in the study. This is a phenomenon that can be seen as well in other mountainous regions of the globe (Brown, 2008).

For all the countries with an interest in mountainology (Gascon and Pașca, 2012), the central idea, on which all the studies and development projects are focused upon, is that of the mountain depopulation, as a result of the natural and social and economic gaps between mountain and non-mountain areas, and, implicitly, on the possible solutions for stopping this dramatic trend. Stopping the decrease in the mountain area population is justified not only as an interest for the local administration, but also as a national and general interest as well. This is because the depopulation of the mountain areas intensifies not only the problems these regions are facing, but it will have negative consequences on the entire

Romanian society. The population present in the mountain areas can help realize at least the following national objectives (Plăiaș, 2013): **a.** ensuring the societal use of natural food producing resources; **b.** maintaining the normal exploitation potential of the soil, which is paramount when it comes to ensuring Romania's general food security, but especially important in times of military or economic crises; **c.** contributing to the soil's protection from corrosion; **d.** it represents an important, pollutant-free, natural food source, with an always available internal and external market; **e.** contributing to an decentralized habitat; **f.** participating to the realization and protection of attractive landscapes; **g.** it is at the basis of the system for the protection of traditional cultural goods and values.

Although the agricultural natural resources are economically weaker in the mountain areas, especially when compared with those from the hills and plains areas, because of their extent and their potential as a national food source, they are too important to ignore.

The objectives of the current research are that to determine the population dynamics over the past 11 decades, the age structure of the current population in the Apuseni Mountains area, and to create a prognosis regarding the demographic evolution until 2030.

In most countries the cause for the massive exodus from the mountain area is seen as the existence of a complex gap between the mountain and non-mountain areas, centered on the differences that exist between the personal incomes of the inhabitants. Furthermore, a Swiss study (Leibungut, 1976) proves the existence of a strong parallel between the extent of the personal income gap between the mountain and non-mountain areas and the tendencies and overall depopulation dynamics in the after mentioned areas. Therefore, in the before mentioned study, and many others, the authors consider that one of the solutions to the critical situation presented by depopulation is to significantly increase the inhabitants personal income, by diversifying the available human activities (such as industry, tourism, services and others), modernizing the economy, implicitly the agriculture and the habitat, including here the infrastructure as well.

THE RESEARCH METHODOLOGY

For the current article, the information was provided mainly by nine censuses of the Romanian population, starting with the one performed in 1900 and ending with the one from 2011 (Plăiaș, 2014). More than that, the research uses data from the databases of the National Institute of Statistics, especially from the six Regional Statistics Departments relevant to the six counties covered in the study (Alba, Arad, Bihor, Cluj, Hunedoara and Sălaj), not to mention a diverse reference list dedicated to the socio-economic development of the mountain areas.

To better underline the way in which the population dynamics in a mountain area are dependent on altitude and complementary natural and socio-economic factors, we grouped the communes from the studied area by their placement in the territory by altitude groups, a criterion which was then used to calculate and interpret several indicators. In order to group the communes by altitude groups we used the study: *Climate zoning of farmland soil in R.S.R. – scale 1:500,000 (Raionarea pedoclimatică a terenurilor agricole din R.S.R. – scara 1:500,000)*, written by the Institute of Pedology and Agrochemical Research in 1972. The administrative territorial delimitation of the region, especially for the five altitude groups identified within it, was done by selecting the communes with the entire or most of the surface area as part of the Apuseni Mountains area, which can be considered as the region between the Mureş corridor, in the south, and the Someş corridor in the north, the Transylvanian plateau in the east and the West Plain and Hills in the west.

For complex regional studies (with both a natural and a social and economic point of view) it is imperative to use an administrative territorial delimitation which, in most cases, is not identical with the natural delimitation of the territory. This type of delimitation is necessary since the current study contains social and economic indicators (total population, population density, birthrate, migratory rate, population dynamics, total land use, production indicators, territory usage indicators etc.) which in turn is based on data evidence that is available only on communes level, whose territory extends most of the time over several natural areas (the Apuseni Mountains area and its neighbors). In order to better underline the particularities of the mountain area, there were several communes not included in the study, since most of their territory is outside the studied region, although their social and economic life is closely linked to the mountain (Ilia, Brănişca, Soimuş, Hărău, Rapoltu Mare, Geoagiu etc.).

Solving this apparently simple problem created several practical difficulties when it came to grouping the territory on altitude levels, because sometimes the difference in altitude between the lowest and the highest point within the territory of one commune is greater than 1,000 m. Considering the way the 122 communes are grouped by altitude, five sub-zones were created:

– **low sub-zone (100–600 m)**, which includes 36 communes, with more than 75% of their territory inside the 100–600 m altitude range;

– **mixed-low sub-zone (100–1,000 m)**, which includes 25 communes, with more than 60% of their territory under 600 m altitude, while more than 75% of it being situated under 800 m altitude;

– **mixed sub-zone (400–1,000 m)**, which includes 20 communes, with more than 75% of their territory inside the 400 and 1000 m altitude range;

– *mixed-high sub-zone (600–1,000 m)*, which includes 20 communes, with more than 75% of their territory inside the 600 and 1000 m altitude range;

– *high sub-zone (over 800 m)*, which includes 21 communes, with more than 75% of their territory over 800 m altitude;

For the rest of the article we will provide a differentiated assessment of the indicators on these five sub-zones, every time the research requires it.

THE RESEARCH RESULTS

THE EVOLUTION OF THE TOTAL POPULATION

The first instances of the census, called “urbarii”, had a fiscal origin and included only the head of the household. They were done in 1652, 1691, 1692, 1698 (the last one known as „nova connumeratio”), 1714, 1715, when they started to get better, and by the 1750 the census was based on more scientific criteria, although only in 1784–1785 they mentioned the number of people.

In those times, as a result of the social and economic conditions, the locals in the Apuseni Mountains area used to hide their wealth and especially their livestock. “*The people of the mountain used to hide many things, and even themselves.*” (Toth, 1965, p. 102) Hiding goods and even the entire household was how the mountain people fought for survival, by using the forests around them to create new groves and households, even without the knowledge of the local authority. And while living there was tough, they at least had the illusion of freedom.

As a result, the “urbarii” from the Apuseni Mountains area were not the most accurate appraisal of the total population living there. However, one can conclude that between 1692 and 1750 there was a progressive increase in the population in the area, despite the disasters from that time: “*the changes in authority, the extremely high fiscal taxes, the wrongdoings of the armed forces, and the lack of security inside the country, all of which led to devastation, partial emigration and emptied villages.*” (Toth, 1965, p. 102)

The census of 1784 finds a more numerous population at high altitude compared to the one before it. What followed are the censuses of 1900, 1910, 1930, 1941, 1956, 1966, 1977, 1992 and 2011 which provided the data for the current study (*Figure 1*).

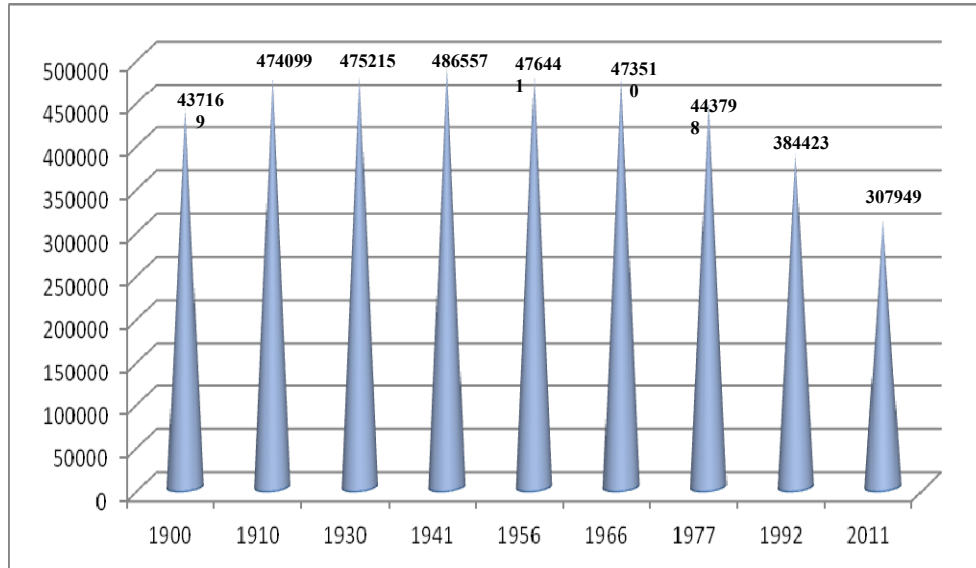


Figure 1 – The population dynamic in the Apuseni Mountains area (1900–2011).

Following the available data for the analyzed period, we can see that in the last 11 decades there have been time intervals when the population increased significantly, sometimes when it stagnated, and the last periods of time starting with the 1966 census, when the population decreased dramatically.

As the graph shows, by the 1992 census the population reached 384,423 individuals, a constant decrease compared to the maximum reached at the beginning of the Second World War (486,557 for the 1941 census), and this tendency continues: the 2002 census records only 350,315 individuals, while the 2011 census shows only 307,949 people. As a conclusion, it can be said that in the last decades the Apuseni Mountains area has experienced an accelerated depopulation process, which meant that by the year 2011 the population was under two thirds compared to the value registered before the Second World War and only 80.1% of the value registered at the end of the communist regime. The graph in *Figure 1* underlines the fact that decrease in the population from the mountain area is without precedent and, if not addressed with suitable recovery strategies, it could lead to total depopulation.

The depopulation of the Apuseni Mountains area started over six decades ago, yet became accentuated only after the political changes following the 1989 Revolution, changes that were added to the economic and social factors influencing the area (the existence of an inequality complex between the mountain and non-mountain areas) and other reasons (the emancipation of women, the increased cost for raising a child, the reduction of the economic role of children in the household economy, the use of modern contraception, the changes in legislation regarding

abortion, the changes in lifestyle philosophy etc.), not to mention the changes in the demographic behavior of the Romanian mountain population (the increase of social mobility).

The decrease in the number of inhabitants in the Apuseni Mountains area in the last six decades also happened while the country's population experienced continuous growth. However, lately there has been a decrease of the country's total population as well, especially in the rural areas, but this is a more recent development and at a lesser scale (*Table 3*).

Table 3

The evolution of the population in the Apuseni Mountains area, compared to that of the total population (1900–2011)

Area	The relative variation of the population compared to that of the 1900–1930 period								
	1900	1910	1930	1941	1956	1966	1977	1992	2011
Apuseni Mountains	100	108,4	108,7	111,3	109,0	108,3	101,5	87,9	70,4
Apuseni Mountains	–	–	100	102,4	100,3	99,6	93,4	80,9	64,8
Romania	–	–	100	111,1	122,5	133,8	151,0	159,3	111,4

Inside the Apuseni Mountains area there are also differences regarding the triggering moment for the depopulation phenomenon and the scale on which it has developed over time. To underline this aspect, and starting from causes that generally start the depopulation of the mountain regions (weak soil production potential, rough climate for the agriculture which provides the means for existing, lack of infrastructure and communications, terrain configuration with implications towards work output and possible work means, all these and many more generating a low standard of living for those living on the mountains) and considering the fact that each of these causes are a consequence of altitude, we considered that the population should be investigated based on the altitude sub-zones previously identified (*Table 4*).

Table 4

The evolution of the population by altitude sub-zones

Altitude sub-zone	The relative variation of the population compared to that of 1900 = 100%								
	1910	1930	1941	1956	1966	1977	1992	2011	
100–600m	109,2	108,0	111,4	113,6	117,7	111,5	101,4	81,3	
100–1000m	114,6	114,6	114,9	112,1	102,3	99,8	87,7	72,9	
400–1000m	107,0	106,4	104,5	99,7	96,1	92,2	74,1	55,5	
600–1000m	98,7	97,7	104,9	94,4	97,6	87,1	75,4	53,3	
Over 800m	111,8	118,6	122,4	124,7	126,4	112,5	91,4	71,2	
Total	108,4	108,7	111,3	109,0	108,3	101,5	87,9	70,4	

The evolution of the numbers in the before mentioned table confirms that the depopulation phenomena started earlier in areas with a higher altitude and it gets more intense with growing altitude, yet altitude, with all its implications is not the only cause for depopulation. Because of this, the group living at over 800 m altitude is in a different situation than the ones in the other sub-zones, being also the one with the more distinct evolution. The fact that the group living in the toughest conditions, when it comes to soil production, has, at least in the beginning of the depopulation phenomenon the lowest migration, confirms what Jonathan Power (cited by Miftode, 1984, p. 150) said when enumerating the causes of the rural exodus: *„the village remains behind when it comes to cultural and civilization development; the villagers understanding what a city is; the differences between the urban and rural standard of living; the frustration they feels as they come in contact with the city and its lifestyles etc. As long as the rural people didn't move away from their villages and didn't know about city life they didn't consider abandoning their village life. As they became aware of the existence of a different social medium, and especially of its advantages (economic, cultural, social status etc.) the rural people became potential migrants, waiting only for the opportunity to go to better, more favorable regions”*. As it appears, this awareness, and the occasion to migrate was made available later for those living more isolated at higher altitudes, who in this case are the group situated in the over 800 m altitude sub-zone.

The experience of other countries (France, Switzerland, Italy) shows that once the mountain dwelling people became aware of their situation, their frustration becomes more apparent as they are more isolated (at a higher altitude), and as a consequence of the massive migration depopulation occurs. This is done mainly by young people leaving to schools and workplaces which can provide them with a better standard of living. And young people leaving an area worsens not only the current demographic situation but also the future one.

The most intense overall depopulation in the Apuseni Mountains area took place in the last five decades, when the number of people decreased by 165,561, roughly 35% of the population existing in 1966.

To better understand the facts, we used the five altitude sub-zones we previously defined to research their recent demographic evolution (*Table 5*). What can be seen from the data is that the best situation is observed on lower based settlements, in the first and second sub-zone, which have big villages and communes, placed by river beds, on fertile soil and especially with access to main communication channels. Going up and over the 400 m or 600 m threshold, the population decrease intensifies as a result of the people's migration to better regions.

Table 5

The population's evolution in the Apuseni Mountains area (1992–2011), altitude sub-zones

Altitude sub-zone altitude	Absolute numbers			Percentage (1992=100)		
	1992	2002	2011	1992	2002	2011
100–600 meters	135,961	125,617	109,096	100	92.4	80.2
100–1,000 meters	83,724	77,702	69,633	100	92.8	83.2
400–1,000 meters	52,737	46,733	39,526	100	88.6	74.9
600–1,000 meters	59,710	53,033	42,214	100	88.8	70.7
Over 800 meters	52,291	47,230	40,742	100	90.3	77.9
Total	384,423	350,315	301,211	100	91.1	78.4

Still, currently the high altitude group is less affected by depopulation, as the decrease in the number of individuals was less intense than that in the other altitude sub-zones. The fact that the phenomenon reacted similarly in both high altitude and low altitude groups should not deceive us with regards of its causes and mechanism. People from low altitude areas have a generally better standard of living and can do a much more diverse number of economic activities compared with those living at higher altitude in the Apuseni Mountains area. Furthermore, they have better access to workplaces and urban services, so they are less inclined to leave their birthplace.

People living at high altitudes, on the other hand, do not have these facilities, so the answer to why they do not migrate too heavily, should be searched elsewhere. There is a distinct possibility that their lifestyle is based on a different set of values and aspiration than that of their low altitude brethren, as a result of the relative isolation in which they are living. Therefore, they are not so mobile, and, more likely, they do not have the same access to all the information needed to migrate, which in turn makes leaving a much more risky alternative. But this is not a stable solution, since anytime the living conditions at high altitude become very rough, it can trigger a migration wave which will cause a drastic reduction of the population, something that may have already happened recently, as the current study will show.

AGE STRUCTURE OF THE POPULATION

A graphical analysis of the 2011 census, putting the male population on the left side and the female population on the right side, by age group will give us the age pyramid for the analyzed region (*Figure 2*).

This analysis can help us see some important aspects regarding the population in the Apuseni Mountains area. The generic name of “age pyramid” is used by demography specialists to show a normal distribution of the population in a certain region: a large base for starting out, which becomes smaller and smaller as the age gets higher, until the two sides of the graph are united at very old age,

the end result looking like pyramid. Unfortunately, our graphical representation does not look like a pyramid, but more like a diamond. Its base is much more restricted compared with its middle, and, more importantly, it also has a high tendency for getting even smaller. The phenomena captured in this “photograph” of the current demographic situation in the Apuseni Mountains area underline an unnatural state for a demographic situation. The aspects shown in it are of a grave importance not only because of their current level, but also because their tendency shape up an unfortunate future for the region. Currently, there are less young people than they should for a healthy population. Furthermore, their numbers are rapidly declining. If we add to this the changes (Rotariu, 2009, 2010) that happened in the current demographic behavior (the decrease in fertility, birthrate, number of weddings and marriages, and the increase in the number of legal separations), and the growing tendency of the young to migrate, we can conclude that in the Apuseni Mountains area we are losing precisely the element needed to regenerate the population. In other words the area has the most important loses of population from the age group that is most relevant to maintaining a healthy population.

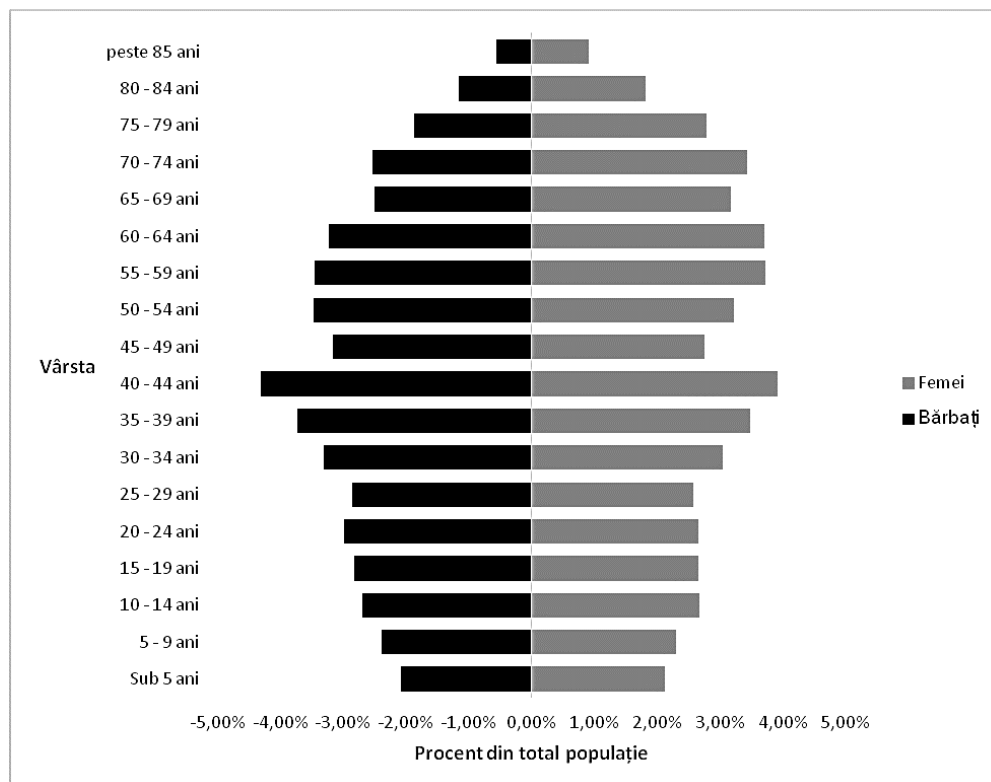


Figure 2 – The population in the Apuseni Mountains area, grouped by age and gender, according to the 2011 census.

Although the phenomena underlined in the five altitude sub-zones are the same overall, their intensity is significantly different. What needs a special attention is the situation present in the mixed sub-zones, where the population is most affected from a demographic point of view (*Figure 3*). As it can be seen, the percentage of children under five years of age in these regions is only 3.73%, and that of children aged between five and nine years is 4.19%, a situation even worse than that present overall in the Apuseni Mountains area, where children under 5 years of age account for 4.20%, and those aged between five and nine years are 4.68%. To make a broader comparison, at national level, the percentage is 5.19% for children under five years of age and 5.24% for those aged between five and nine years. As it stands, the danger of depopulation is far more present in the mountain region as compared to the national situation. And this is the result of the fact that the migration began earlier in these altitude sub-zones, as compared to the others we've already identified (Plăiaș, 1994).

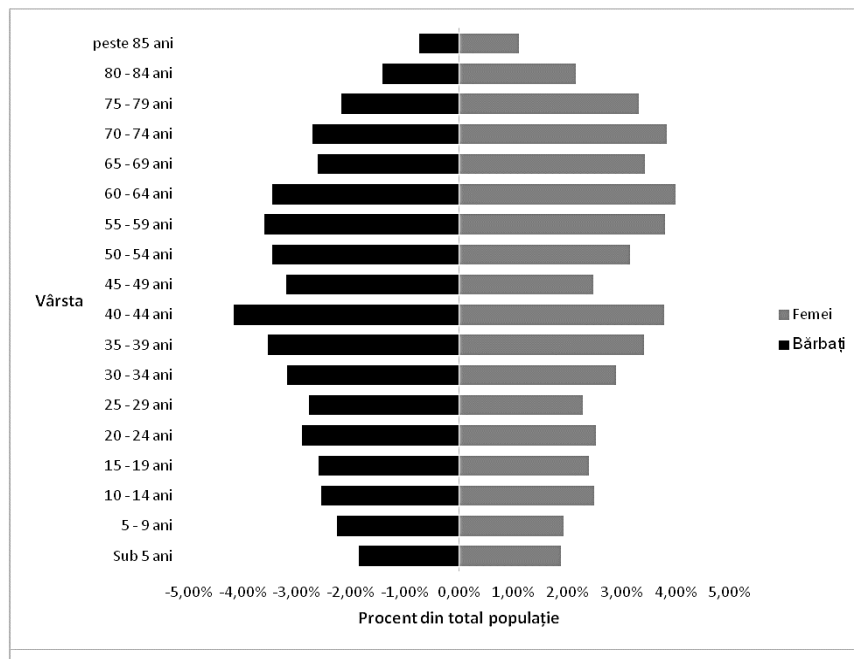


Figure 3 – The population in the mixed sub-zones in the Apuseni Mountains area, grouped by age and gender, according to the 2011 census Average age.

By observing the demographic decline from the last decades and the gravity of the aspects as shown by these age “pyramids”, one aspect that becomes hard to understand is the irresponsibility, lack of interest and vision shown by the authorities. We are heading towards disaster, like in the “fable of the blind”, while

none of the governments so far showing that they are mindful of Romania's demographic problems. And while the negative aspects we've identified are more developed in the Apuseni Mountains area, the current national demographic situation is not much better (Ghețău, 2007, 2012). We also want to underline that it is not the decrease in the number of inhabitants that is the most troubling aspect, but the structure of the pyramid that is weaker at its base, which shows a weakening natural capacity of the population to reproduce. The decrease in the number of young people, coupled with more numerous old people leads to hard to overcome economic and social situations.

The demography specialists (Trebici and Hristache, 1986) claim that the average age of a population is calculated based on statistics which reflect the age structure of the population by years and not by time intervals.

Table 6

The average age for the population in the Apuseni Mountains area, by altitude, 2011 census

Domain	Average age for the total population (years)	Average age for the female population (years)	Percentage of women aged between 15 and 49 years old (%)
Romania	40,60	42,1	23,37
Apuseni Mountains total area, of which:	42,44	43,88	21,05
– Low sub-zone (100–600 m)	41,82	43,46	21,39
– Mixed-low sub-zone (100–1000 m)	42,21	43,59	21,00
– Mixed sub-zone (400–1000 m)	44,23	45,98	19,74
– Mixed-high sub-zone (600–1000 m)	43,19	44,71	21,06
– High sub-zone (over 800 m)	41,74	43,28	20,31

Still, when lacking this type of data for the 2011 census, we used a computing artifice in which we used the number of individuals and the median age value for each sub-zone. Although this approach may influence the end results, the differences, whether they are on the positive or the negative side, annul one another, which eventually gives us the correct trend for the research phenomenon, even if the calculated value might differ by 1 or 2 decimals from the real one.

In this case, the data from *Table 6* show without any doubt just how high the average age of the population is in general in the Apuseni Mountains area, and especially in the mixed sub-zone, the one which is most affected by depopulation. The current situation is worse than that at a national level, even though the average national age of 40,60 years, as it was according to the 2011 census, it's still quite alarming. The situation is graver still, as the indicator's value has grown in recent years, from 34,9 years as it was according to the 1993 census. So in less than 20 years, the average national age in Romania grew by almost 6 years. In the Apuseni Mountains the situation is even worse, especially considering the speed with which things are degenerating.

THE DEMOGRAPHIC AGING OF THE POPULATION

This indicator is calculated by reporting the number of people over 60 years of age to the number of people up to 20 years of age, and its interpretation is done by percentage (*Table 7*). When this ratio, which shows demographic aging, is equal or greater than 52%, the population is considered to be very aged. By comparing the values from the table below with the threshold of 52%, we can understand just how grave is the demographic situation in the Apuseni Mountains area, since an indicator of 125,92% highlights an extremely aged population. Even in this case, the mixed sub-zone is the worst with a value of 154,64%. We should also mention that even on national level the indicator is evolving in a negative direction, but the aging phenomenon is far less advanced.

Table 7

The demographic aging of the population

Domain	Demographic aging (%)	Dependency ratio (‰)
	+60/-20	-20+ 60/rest of the population
Romania	92,82	779,57
Apuseni Mountains total area, of which:	125,92	890,95
– Low sub-zone (100–600 m)	115,84	876,53
– Mixed-low sub-zone (100–1000 m)	125,26	882,25
– Mixed sub-zone (400–1000 m)	154,64	941,46
– Mixed-high sub-zone (600–1000 m)	135,65	886,81
– High sub-zone (over 800 m)	115,66	917,67

Compared with 1st of July, 1993 when our demographic aging indicator had a value of 52,8% at a national level, the 2011 census revealed a value of 92,82%. But in the Apuseni Mountains area the situation is incomparably worse. Because of this, we have a very high dependency ratio, when compared with the one at a national level, its value almost becomes 1 on 1 for the mixed sub-zone from the Apuseni Mountains area. This ratio shows the economic burden supported by the adult population in order to support the young and the old, who, in general, are not economically active.

What distributing the population on altitude sub-zones clearly shows is that demographic phenomena differentiate between high altitude and low altitude settlements, the former being obviously more affected by population loss. The more recent data indicate that there already has been a massive exodus of the population from the high sub-zone, which will have the consequences already visible on intermediate level, where the depopulation started much earlier: population aging, decrease of birthrate, increase in mortality etc. We will not get into too many details with regards of the subject, however we would like to

underline the fact that for many settlements the aging process is at a very advanced stage, so advanced, in fact, that total depopulation is imminent.

Specifically, the current demographic situation is the accumulated result stemming from the direct action of three important factors (birthrate, mortality and external migration). The decrease in birthrates is not something that happens only in mountain areas. As Jean Claude Chesnais (1986) said, “*the fertility changes are but an aspect of the great transformations which affect contemporary society, demographic evolutions are transnational and more and more on a global scale, just like the evolution of ideas, fashion and technology.*” From the three factors previously mentioned, the decrease in birthrates has the more important implications and it is also the hardest to control when it comes to demographic decline, as it is a contributing negative factor not only to the current population, but also to the future evolution of the number of individuals, by disturbing the age structure. Still, external migration should not be ignored either. External migration contributed not only to the decline of the current population, but, by having most of the young people leaving, it has influenced the structure of the fertile population, which in turn affected the birthrate and implicitly the future age structure in the area.

Table 8 shows that lately, the high sub-zone has had the most worrisome depopulation as a result of the massive migration from the area. Here, the phenomenon took place later than in other sub-zones where, although the people had access to higher quality food resources, they had also realized much sooner that they could achieve a better standard of living by migrating elsewhere. Still, the depopulation is accentuated, especially in the higher altitude areas, and it will get worse unless measures are taken to encourage population to remain in the region.

Table 8

The comparative evolution of demographic phenomena by altitude sub-zones

Altitude sub-zone	Average natural growth		Average migratory growth		Average total growth	
	1981–1990	2008–2010	1981–1990	2008–2010	1981–1990	2008–2010
100–600 m	–0,6	–6,9	–5,1	–1,7	–5,7	–8,6
100–1 000 m	–2,2	–7,7	–8,8	2,0	–11,0	–5,7
400–1 000 m	–3,5	–9,4	–10,8	–1,1	–14,3	–10,5
600–1 000 m	–0,4	–8,0	–11,2	–9,3	–11,6	–17,3
Over 800 m	4,9	–6,0	–17,3	–7,1	–12,4	–13,1
Apuseni Total	–0,5	–7,5	–9,4	–2,6	–9,9	–10,1

We can easily see that in the following years the evolution of the current demographic phenomena will lead to a rapid demographic decline, until the end result will be a complete depopulation of extended areas unless the Romanian authorities urgently intervene. Without control measures, the demographic phenomena described in the Apuseni Mountains area will lead to an unprecedented

degradation of the social and economic situation in the region, and as a consequence to an almost total depopulation.

The most sensible indicator with regards to structural changes, as it is mostly dependent on population aging, is the *mortality gross rate* (15,2‰). Also, another indicator that can influence the total number of individuals at a certain moment in time is the *infantile death rate* (deceased up to 1 year old reported to the number of live births in a calendar year), rate which has a value a bit higher in the area (12‰) than the national average (10,3‰) in the three years worth of data included in the study.

Considering the poor situation of the studied area for both dimensions (low birthrate and high mortality), it is obvious that the standardized value of the average natural growth can only be negative. And, as it can be seen from *Table 8*, this is actually the case in the region: the population in the Apuseni Mountains area is decreasing by this natural process of birthrates and mortality as well, on average by 7,5 individual to every 1,000.

Moreover, in the three years we've analyzed, the Apuseni Mountains area had a negative migration score (including here both population exchanges with other regions of the country and the external migration), the *average migration rate* being – 2,6‰.

The gravity of the depopulation of the Apuseni Mountains area is accentuated by the fact that, as foreign literature has already successfully stated (Egger, 1992), once a mountain area loses its population there are no viable solutions to repopulate it with inhabitants willing to take on all the responsibilities currently attached to mountain households. The experience from other countries has shown that repopulating the mountain regions with individuals coming from non-mountain areas is not a viable solution (Christians, 1991). All this means that there is only one possible strategy for the recovery of the population in the mountain area: increase in natural fertility combined with a massive reduction of external migration. However, the evolution of external migration is unpredictable, as it depends directly on the economic and social evolution of the zone. Our presumption is that people will continue to migrate from the area in the following years as well, which in turn will make the demographic situation in the Apuseni Mountains even worse.

Population prognosis (2015–2030). By using as computing basis the data acquired from the censuses (1900–2011) we created, by the least squares method, a prognosis for the evolution of the population in the Apuseni Mountains area for the next 15 years.

The curve in *Figure 4*, which was modelled after the evolution in the 1900–2011 time period, and the added prognosis up to 2030, indicates a continuous drastic reduction of the population, a situation unprecedented in the area. We can only presume that if there are no significant changes in the circumstances that created the problem in the first place, the trend will continue, leading to an estimated total population of 201,273 inhabitants by the year 2030. Compared to 2011 this is a reduction of the population by 31,7%.

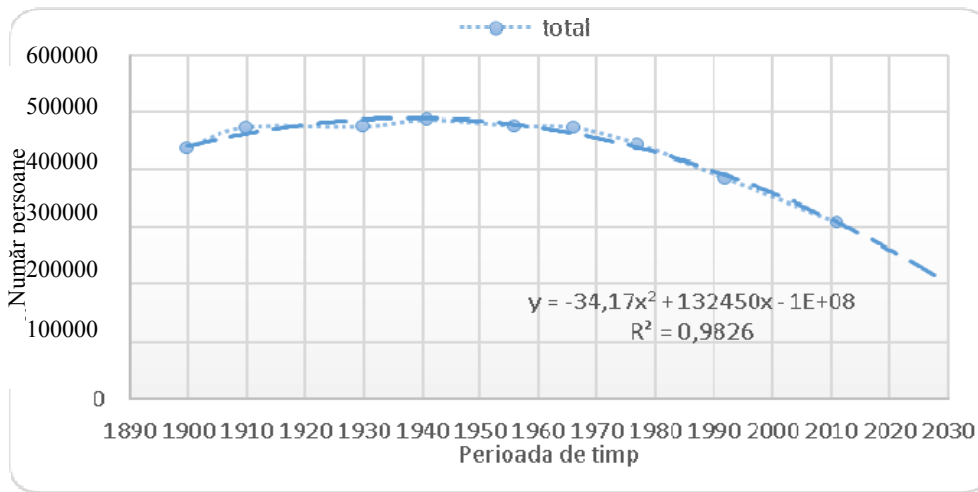


Figure 4 – Evolution of the total population in the Apuseni Mountains area (1900–2030).

The high degree of depopulation identified in the mixed sub-zone in the last decades, more pronounced than the overall one, will lead to an even more drastic reduction in the number of inhabitants, so that by 2030 the sub-zone might have only 21,735 people living there (*Figure 5*), that is 46,1% less than the numbers living there in 2011. As the analysis has shown, the depopulation phenomenon gets progressively worse, “feeding” on itself, and becoming both a cause and a consequence with effects similar to the factors which previously led to depopulation, as the ones who will leave first are the young people.

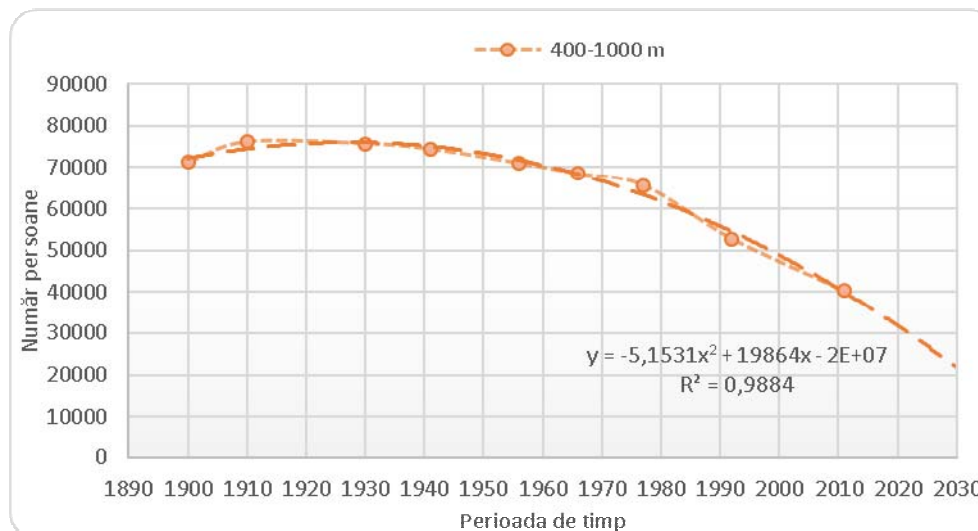


Figure 5 – Evolution of the population in the mixed altitude sub-zone (1900–2030).

The isolation, the lack of communication, infrastructure, of information and contact with the aspects of the modern and more economically developed world made the inhabitants of the high altitude sub-zone from the Apuseni Mountains area to understand later that there are better alternatives to the standards of living that they were accustomed to. Because of the rough living conditions in the area (poor soil, rough climate, lack of infrastructure and services, great distance to reach the minimum services they might need etc.), once they realized they had better alternatives for living, they started an accelerated depopulation of the area located at over 800 m altitude in the Apuseni Mountains, that will eventually be greater than the one present in lower altitude regions. The calculations show that by the year 2030, this sub-zone will have only 20,198 inhabitants, 51,6% less than the ones accounted for with the 2011 census.

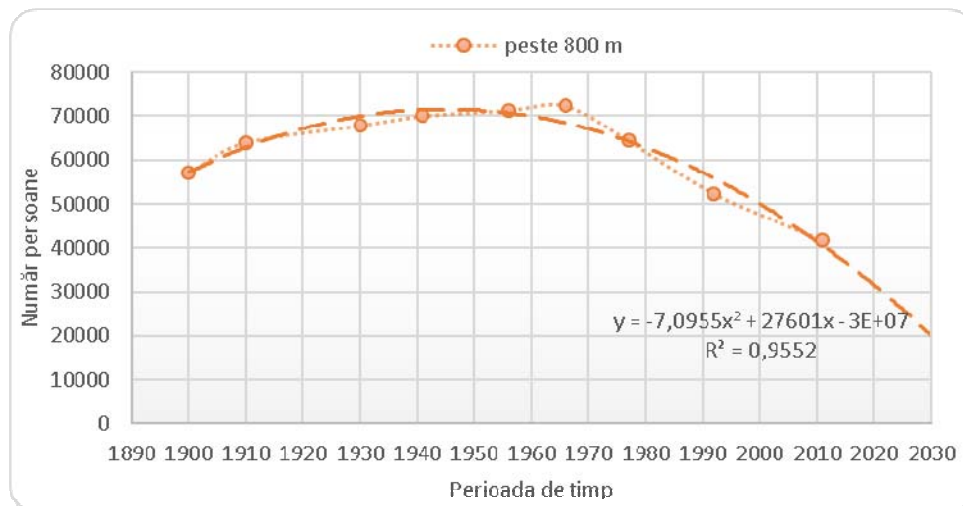


Figure 6 – Evolution of the population in the high altitude sub-zone (1900–2030).

Even if the prognosis we shown by our calculations may look exaggerated, that is not the case. We were fairly optimistic in our prognosis, relying on the data collected in the previous time periods. The results of the current prognosis show only the quantitative influence of the reduction in the number of the total population. The data show where we can find ourselves in the future, should the depopulation of the Apuseni Mountains continue at its current rhythm. But we are also fairly certain that this rhythm will increase considerably in the years to follow, as we not only saw a decrease in the total number of inhabitants in the studied area, but also a severe narrowing of the basis for the age pyramid and a qualitative degradation of the population's age structure, which in turn leads to depleting the "source" that should theoretically provide with new inhabitants. As a consequence, it is very possible that in the following 15 years the depopulation in the Apuseni Mountains will become even worse compared to our prognosis.

CONCLUSIONS

Based on the study of the population dynamic and age structure in the Apuseni Mountains area, we have reached the following conclusions:

- in the current period, the population in the studied region is at its lowest point in the last 11 decades;

- the rhythm in which the demographic situation from the Apuseni Mountains area degraded is extremely worrisome;

- nowadays, the population is dangerously aged, especially in the mixed sub-zone;

- the “demographic pyramid” has a dangerously narrow base, which signifies an important reduction of the number of young people, and implicitly an increase in the ratio of older people, with all the negative consequences which can spring from it (lower birthrates and fertility, lower number of women in their fertile years, higher mortality rates and dependency ratio);

- the average age and the ratio between the number of individual over 60 years of age and that of the population younger than 20 years, explicitly shows just how aged is the population in the Apuseni Mountains, with differences from one altitude sub-zone to another;

- the decrease of the population takes place not only because of lower birthrates, but it is also due to higher migration and mortality rates, as a general result of population aging;

- the main cause for the registered exodus of young people is the low standard of living, based on very low income coming from agriculture, which is the central economic activity in the area. To that, we can add as causes: the impossibility of supplementing the income with complementary activities due to their inexistence; the total or partial absence of infrastructures; the feeling of frustration generated by isolation and the perception that mountain inhabitants have been abandoned by the society etc.

- the projected prognosis shows a significant increase in the depopulation of the Apuseni Mountains area for the following years;

- the Romanian society should intervene, through its authorities, in order to stop this depopulation process;

- there should be no more delays in creating and implementing a strategy to encourage people to remain in the area. Even if we passed the point of no return, it is still worthwhile to implement an urgent strategy that will help avoid a total and irreparable depopulation.

As the study has shown, the current demographic situation in the Apuseni Mountains highlights the need for an intervention from the national authorities with a complex policy (economic, social and demographic), needed to sustain the interest of the local population to remain in the area and to insure that the proper demographic phenomena are taking place, at least when it comes to simple

reproduction. Without at least one component directed at stopping the current demographic decline in the region, any economic development strategy for the area would be incomplete and would fall short on the long term. Delays in implementing this type of strategy will lead, most certainly, to the worsening of the current demographic situation and implicitly to higher costs for future interventions.

Romania's interest regarding the capitalization of its natural resources in its mountain areas should be promoted in every long term policy, starting with a thoughtful demographic strategy for these regions, which should be supported by economic and social development, necessary to give the people living there an optimistic view of their future. Capitalizing the natural resources (agriculture, forestry, services, environmental protection etc.) cannot be done without the presence of people in the area, people who are at the right number and structure, by age and gender (education, religion, maintaining the local traditions and values, social life etc.)

It has become apparent the need for creating and implementing alternative projects which can, in turn, deliver solutions for revitalizing the mountain areas which are now experiencing demographic, social and economic decline. These projects should focus on improving the standard of living for the local residents. When elaborating a strategy for durable development of the Apuseni Mountains, the local population should be its central component. The solutions should provide with a substantial increase in individual income, habitat and infrastructure modernization and diversification of the available economic activities.

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