Aspects on the Transformation and Decline of Mining Communities in Romania

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A B S T R A C T

The paper aims to analyze the evolution of mining communities from Romania after 1997, period in which most of the mining exploitations were closed. We analyzed the influence of five factors on the change of population and number of employees between 1996 and 2015, namely: share of area covered with agricultural land in 1996; 2) area covered with forest, 3) distance from county seat; 4) share of young people (between 0 and 19 years old) in the total population in 1996; and 5) share of public housing in 1993. The analysis of statistical data was conducted for 383 mining communities. In addition, we conducted a qualitative analysis in two former mining communities of Maramureş County, namely Borşa and Cavnic, in order to grasp a better understanding of how the mining communities changed over time and identify the factors that influenced their evolution. The results indicate that share of youth in total population, area covered with agricultural land and forest, distance from county seat, and share of public housing do matter for the redevelopment of a mining community; however, the intensity of their influence depends on the conditions existing at local level.

1. INTRODUCTION

Our study aims to analyze the trajectory of mining communities from Romania after 1997 when the majority of mining activities were closed by assessing the current status of these communities comparatively with their status before mining restructuring, in order to identify the factors that influenced their redevelopment. The term community is used as a generic term referring to territorial-administrative units (be them communes, cities or municipalities), and not referring to the Tonnies' meaning of a community (respectively to the social relationships existing among residents) [1, p. 28]. When using the term mining communities we refer to settlements where most of the jobs are/were in the mining sector or in economic activities related to the mining sector, or where the majority of households are/were dependent on earnings from the work conducted in this field.

Mining communities have several characteristics that set them apart from other types of communities, such as: strong occupational identity and strong connections among miners (Warwick and Littlejohn, 1992; Dale, 2002; Strangleman, 2001), tendency to grow as mono-industrial settlements (Liljenäs, 1992; Lockie et al., 2009), dependency on public institutions (Bell, 2009), lack of entrepreneurial capital (Chiribucă et al., 2000; Johnstone and Lionais, 2004; Eikeland, 1992), a large share of population coming from other parts of the country, a large share of younger workforce, and a lower employment rate among women. Johnstone and Lionais (2004) described former mining communities as "depleted communities" arguing that they lost much of their economic rationale as space, while keeping strong social relationships and attachment to the place [9]. Wray and Stephenson (2012) identified in the de-industrialized mining communities a disintegration of social

infrastructure around which such communities usually join forces [11]. Hospers (2004) argues that former mining communities tend to face three types of blockages, economic, institutional and cognitive, that impede their redevelopment. The economic blockage manifests through paralyzing entrepreneurship, innovation and flexibility. The situation of "institutional blockage" occurs when the interest of institutions involved in the process of redevelopment is to preserve the existing economic structure, while "cognitive blockage" occurs when local actors have an over-optimistic view about the redevelopment potential of a community [12]. These types of blockages were found as hindering the redevelopment capacity of former mining communities.

In this paper, we analyze mining communities from a system perspective, seeing them integrated into larger geographical areas with which they interact. The decision to close a mine affects not only the community where it is located, but the wider geographical region that provides additional workforce or where the ore is processed. Understanding the trajectory of mining communities is important because many communities were affected by the restructuring of the mining sector in 1997. Therefore, our paper aims to analyze the trajectory of mining communities after 1997 and to identify the factors that influenced their path after restructuring. The rest of the paper is divided in the following parts: a short presentation of the development of mining communities in Romania, a literature review on factors that influence the redevelopment of mining communities, the description of the methodology that we used, the presentation of the findings and a conclusion and policy recommendations section.

2. THEORY AND METHODOLOGY

2.1. Development of mining communities during communist regime

During communist regime, the country went through a fast industrialization process which influenced the pattern development of settlements in Romania. The industrialization process required large quantities of mineral resources and, in the context of a predominantly closed economy characteristic for the communist period, many mineral deposits started to be exploited disregarding the quality of mineral ores or their distance to the processing centres. Many settlements were developed around mining exploitations and additional workforce was brought from other parts of the country or people commuted on daily basis from the surrounding communities. In this period of intensive economic development, the number of mono-industrial cities grew significantly (Dumitrescu, 2008), as there was little concern with sustainable development of these communities.

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After the fall of the communist regime in 1989, many state owned companies that were unprofitable collapsed generating a reduction in the demand for raw materials. In addition, at the beginning of the 1990s the price of mineral resources on the international market dropped significantly. In this context, Romanian government subsidized a large part of the mining exploitations; for example, between 1990 and 2007 the amount of subsidies paid by the Romanian government to this sector was 6,156.4 million dollars (Ministry of Economy, undated a). When Romania took loans from international organizations to cover the budget deficits, a condition was imposed to drastically reduce these losses, and therefore it was decided to close those economic activities (including mining exploitations) which were uneconomic. In the following years many mining exploitations were closed, which affected hundreds of communities across the country. According to the "Strategy for the Mining Industry for 2012-2035" (Ministry of Economy, undated b), 556 mines were closed between 1998 and 2010.

Table 1 shows the change in the number of employees in industry and extractive industry at national level between 1992 and 2015. The period between 1996 and 2006 faced the largest decrease in the number of employees as 160,300 employees lost their jobs in the extractive sector, while in the same period 771,400 of employees at industry level lost their jobs. The decrease in the number of employees continued in the following years. The data indicates the high amplitude of the economic restructuring of the mining sector and of the entire industry that took place in Romania in the 1990s.

The employees in the mining sector were stimulated to voluntarily leave the system through generous severance payments and through retirement policy starting with September 1997. The Government expected that those who accepted severance payments would return to their native regions; however, this did not happen (Haney and Shkaratan, 2003). At the moment the restructuring process was started, no programs for mitigating social consequences were in place. These programs started to be implemented with delay, and they were developed progressively. An Agency for Mining Areas was established in October 1997 through the Government Emergency Ordinance no. 64/1997; the agency was created based on an agreement between the government and the trade unions (Dani et al., 2005). The Agency for Mining Areas was designated to implement the two loans contracted by Romanian Government from World Bank in 1999 and 2005 for the socio-economic regeneration of the mining regions. 386 localities were declared eligible for programs implemented through Agency for Mining Areas. In addition to the programs implemented through the loans contracted from World Bank, other programs were designed to support economic redevelopment. At 30 September 1998, Government

Emergency Ordinance no. 24 was adopted for granting the status of disadvantage area to those areas that were affected from economic restructuring and had large unemployment rates. Between 1998 and 2002, 34 areas were granted this title and most of them were mining areas, meaning 25 out of 34. The status of disadvantage area granted financial advantages to those companies that decided to locate their activities in those areas, such as exemption from payment of custom duties for cars and machineries imported to invest in disadvantaged areas. In addition, the Law no. 76/2002 on unemployment insurance system and stimulation of

employment provides that an unemployed people who gets a job in a different locality and therefore changes his/her residency, receives a financial aid from the state. However, these policies could not slow down the decline of mining communities because they were implemented with delay.

The following section of the article consists in a literature review of the factors that were found that play an important role in the redevelopment of mining communities. Some of the factors identified in this section will be used to test their influence on the redevelopment of mining settlements from Romania.

Table 1. Number of employees in industry and extractive industry (1992-2015) (in thousands).

Year	Nr. of employees at national level		Nr. of employees in industry		Nr. of employees in extractive industry	
	Total	Change in no. of employees	Total	Change in no. of employees	Total	Change in no. of employees
1992	10,458.0		3,300.9		272	
1993	10,062.0	-396.0	3,030.6	-270.3	259.2	-12.8
1994	10,011.6	-50.4	2,881.7	-148.9	255.9	-3.3
1995	9,493.0	-518.6	2,714.2	-167.5	249.9	-6.0
1996	9,379.0	-114.0	2,740.8	26.6	250.3	0.4
1997	9,022.7	-356.3	2,449.6	-291.2	183.8	-66.5
1998	8,812.6	-210.1	2,316.9	-132.7	169.0	-14.8
1999	8,419.6	-393.0	2,054.0	-262.9	145.8	-23.2
2000	8,629.3	209.7	2,004.1	-49.9	140.3	-5.5
2001	8,562.5	-66.8	2,016.6	12.5	139.7	-0.6
2002	8,329.0	-233.5	2,122.5	105.9	132.8	-6.9
2003	8,305.5	-23.5	2,059.4	-63.1	124.9	-7.9
2004	8,238.3	-67.2	2,051.5	-7.9	117.1	-7.8
2005	8,390.4	152.1	1,973.6	-77.9	106	-11.1
2006	8,469.3	78.9	1,969.4	-4.2	90	-16.0
2007	8,725.9	256.6	1,958.3	-11.1	85.1	-4.9
2008	8,747.0	21.1	1,919.3	-39.0	81.4	-3.7
2009	8,410.7	-336.3	1,773.6	-145.7	73.2	-8.2
2010	8,371.3	-39.4	1,733.3	-40.3	65.4	-7.8
2011	8,365.5	-5.8	1,753.8	20.5	64.8	-0.6
2012	8,569.6	204.1	1,765.3	11.5	65.2	0.4
2013	8,530.6	-39.0	1,777.6	12.3	63.3	-1.9
2014	8,431.7	-98.9	1,781.8	4.2	61.9	-1.4
2015	8,340.6	-91.1	1,872.3	90.5	57.4	-4.5

Source: Romanian National Institute of Statistics

2.2. Literature review on factors influencing the redevelopment of mining communities

There is a large range of factors that influence the regeneration of mining communities, some of them being specific to this type of communities, whereas others exert their influence on a broader range of situations. These factors refer to physical and geographical characteristics of communities, topography (distribution of different types of land uses), characteristics of mining exploitations and of mineral resources, diversity of local economy, distance from other urban centers, degree of concentration of mining workers in one community, public housing ownership, local entrepreneurship, education level of the workforce, size, shape and location of mineral resource comparatively with the boundaries of a community, involvement of public institutions, and

local culture. The physical and geographical characteristics of a community, such as location, distance to urban centers and topography, are important factors that influence their redevelopment. The chances of recovery are greater if the mining community is located closer to larger cities, metropolitan areas or if the community's population has easy access to transportation routes that facilitate access to other employment opportunities (Fisher, 2001; Wilson, 2004; Johansson et al., 1992; Maude and Hugo, 1992; Cocean, 2011). Fisher (2001) analyzing a mining community in Wisconsin, USA found that the larger is population of a former mining community, the smaller is the level of poverty. The author argues that smaller communities face greater redevelopment difficulties because they have a limited financial capacity to initiate programs for economic diversification and to invest in infrastructure

redevelopment. The regeneration potential of a community is directly linked with the level of diversification of the local economy. Filimon et al. (2011) identified a better capacity for rehabilitation of small towns which have a more diversified economy comparatively with those towns which depend on a single industrial activity.

Sandu (2011, p. 18) in a study conducted at national level on social disparities between communities showed that "social development tends to be higher in villages close to a city than in distant ones, in villages located on European roads than in those that have access to rural, country and national roads … Communes that have reduced levels of commuting to a city tend to be disadvantaged by the fact that average income is lower".

Fisher (2001) and Maude and Hugo (1992) showed that the share of land covered by forest is strongly associated with poverty. A plausible explanation is that rural areas that have converted larger shares of their land to agriculture tend to be more prosperous than areas that have larger shares of forest. An explanation is that forest provides "subsistence resources" which help families just to survive and not help them get out of poverty.

A higher concentration of mining workers in one community is associated with larger financial difficulties when the mining activity is restructured. If workers are dispersed among several communities the impact of mining sector restructuring is distributed over a larger geographical area, and the effects are subdued for each locality.

Wolfe (1992) and Neil et al. (1992) found that housing ownership influences the redevelopment potential of a community because housing ownership strengthens the connection of former miners with the community and they tend to remain in the community after the mine is closed even in the context of a limited number of jobs. Selling public houses at very low prices to former miners can increase the social problems by maintaining low income families in the community who do not have other opportunities where to move. Wolfe (1992) and Neil et al. (1992) recommend that when opening a new mining exploitation the workforce to be commuted from longer distance communities or to be fly-in/fly-out. These types of employment arrangements are the best solutions in the case of short life expectancy of a mining exploitation and when there are few opportunities for diversification of the local economy. However, when establishing a mono-industrial settlement is the only solution, Neil et al. (1992) recommends the construction of public houses because they do not give the feeling of permanence and stability for residents, however, without selling these houses to workers.

The level of diversity of local economy plays an important role in mitigating the impact of mining restructuring. The opportunity to find working places in

other economic sectors within the community helps to absorb the surplus of labor force resulted from mining restructuring. A higher degree of economic diversity increases the capacity of a community to diminish the social impact of mining restructuring.

Studies have shown that entrepreneurs play a key role in community redevelopment (Ludescher, 2009). However, people who have the knowledge and skills for starting a business are the first ones to leave the community because they have the best chances to find a well-paid job in other cities; therefore communities facing economic decline lack entrepreneurial capital. In this context, a standard component of intervention programs in communities affected by mining restructuring consists of programs that encourage entrepreneurship development by opening business centers, organizing courses in business management and facilitating access to funding.

The education level of the workforce, measured by the number of school years a person graduated, is essential for the redevelopment of a community (Sandu, 2011, p. 21). Dumitru Sandu notes that investment only in education does not lead to a high level of economic development, as additional programs need to be developed for fostering employment and improving living conditions of those people with high level of education. These people have the potential to have an impact on economic redevelopment of a community

Freudenburg apud Wilson (2004) argues that it is important to understand the characteristics of mineral resources extracted (such as their quality and prices on international market) to better assess the life expectancy of a mining exploitations, and therefore to better plan the employment policies and the development of communities dependent on them. Mineral prices are volatile on the international market, and they can make a mineral resource exploitation profitable or unprofitable, alternating periods of economic growth with economic decline. In this context, number of employees tend to fluctuate, requiring a better planning of the working force by taking into consideration temporary forms of employment and not building permanent forms of residency that would increase the attachment of the employees to a community.

Another factor that plays an important role in the redevelopment of the former mining communities is the extraction method and the level of pollution that it generates to the surrounding environment (Wilson, 2004). A less polluting extraction method that does not cause major changes in the surrounding landscape gives more chances for a successful regeneration of communities affected by the mining restructuring.

The size, shape and location of mineral resources comparatively with the boundaries of a community can explain different types of socio-

economic impacts that a crisis occurring on the ore market might have. In a study of two mining communities from USA Wilson (2004) found that a mining company operating several mines, can respond better to global economic conditions.

Specifically, the company is able to better adapt to fluctuations in the price of ore by focusing on the most productive mines, which allows the company to remain profitable or at least to reduce losses during periods of economic decline. This study shows that when a company has more flexibility in operating due to relatively low costs of exploitation and ownership of several mines with different quality of ores, it can better cope with the temporary decline in the price of minerals.

Involvement of public institutions and of the community in the regeneration process is vital. Neil and Lea (1992) analyzed several cities on the west coast of Tasmania, Australia, which were built to serve mining exploitations and faced the closure or reduction of mining activity. The authors noted that in the case a larger area was affected by the mining restructuring, cooperation was difficult because communities were competing with each other to survive. Moreover, each community had a different approach for redevelopment, and the degree of support from the community differed. Lack of local institutions or of a local support group to mobilize and act as a catalyst for local economic development has been identified as another obstacle to local economic development.

Local leadership is an essential ingredient for a successful redevelopment strategy of a community. Local communities need a leader to guide their efforts based on a shared vision on the community transformation. Usually the mayor plays the leader role, and it is important that the redevelopment efforts to be based on local resources and opportunities, and not to come from outside sources. Local culture (based on trust, common norms, cooperation and similar behaviors) plays an important role in the community life.

Therefore, building community capacity is an important tool in the process of community regeneration. Where the system of rules is weak and the level of trust is low, programs for community redevelopment have low chances to succeed. Therefore, it is important that the members of a community to work together to achieve common goals as the culture can be decisive for the success of a community.

2.3. Methodology

The goal of this research was to analyze the influence of several factors on the path followed by mining communities after the restructuring of the mining sector in Romania.

The analysis was conducted using two types of methods. We conducted a quantitative analysis of statistical data for 383 communities that were dependent on mining exploitations. In addition, we selected two communities out of the larger sample of 383 settlements to conduct in-depth interviews for grasping a better understanding of the factors that influenced their trajectory after mining restructuring.

We selected the 383 communities from the communities declared eligible for programs implemented through Agency for Mining Areas. We estimate that they correspond to all communities that had a connection with the mining industry, by either a mining exploitation was located in those communities or their inhabitants worked for a mining exploitation or for a company that processed the mineral ores.

The 383 communities were spread over 22 counties (see Table 4 in Annex for the list of analyzed localities). The largest number of communities are located in Hunedoara (52), Maramureş (48) and Gorj (41) counties. Hunedoara County was the most affected county having the largest number of localities eligible for funds from National Agency for Mining Areas; 52 out of total 69 localities existing in this county were affected by the restructuring of the mining sector. Another county that faced a difficult economic downturn was Maramureş County, as 48 out of 76 communities had a strong relation with the mining industry.

The goal of the quantitative analysis was to assess the influence of five factors on the trajectory of mining communities after the economic restructuring: 1) share of area covered with agricultural land, 2) share of area covered with forest, 3) distance from county seat, 4) share of young people (between 0 and 19 years old) in total population, and 5) share of public housing in total housing stock. The path followed by mining communities was analyzed based on the population and workforce changes between 1996 and 2015.

We created a database with statistical data from Romanian National Institute of Statistics. We collected data about population change between 1996[1] and 2015, change of workforce between 1996 and 2015, share of area covered by agricultural land in 1996 and 2015, share of area covered by forest in 2010[2], share of young people (between 0 and 19 years old) in total population in 1996 and 2015, and share of public housing out of total number of housing units in the community in 1993 and 2015[3]. In addition, distance from the county seat was calculated for every locality.

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[1] We chose year 1996 in order to capture the change that took place during the year 1997.
[2] Year 2010 is the first year for which statistical data are reported.
[3] We chose year 1993 because it is the first year for which statistical data are provided, and after that year the public houses started to be sold to families that occupied them. Therefore, data for year 1993 provides a better understanding of the effect of selling public housing on the attachment of people to their communities.

We started the analysis from the following hypotheses:

H1. The larger the area covered with agricultural land in 1996 the larger the population growth of communities between 1996 and 2015.

H2. The larger the area covered with forest the smaller is the population growth between 1996 and 2015.

H3. The longer the distance from the county seat, the smaller is the population growth between 1996 and 2015.

H4. The larger was the share of youth (between 0 and 19 years old) in population in 1996 the larger was the population growth between 1996 and 2015.

H5. The larger was the share of public housing in 1993, the smaller is the population growth between 1996 and 2015.

The qualitative analysis was conducted in two former mining communities from Maramureş County, namely Borşa and Cavnic, in order to grasp a better understanding of how the mining communities changed over time and to identify the factors that influenced their paths. Between April and September 2014, we conducted 45 semi-structured interviews with people having knowledge of the analyzed problem: 30 interviews in Borşa and 15 in Cavnic. We conducted interviews with people who worked in various fields, such as public institutions, private companies or their family business, young people, retirees and active professionals. The two cities were selected based on their similarities and differences: the size of the community, distance to other job markets, dependence on mining, mined ore type, place of origin of labor force, status as administrative-territorial unit, access to funding sources and topography. We tried to grasp a better understanding of how the decision to close the mine was made, what was the effect on local residents, what happened with former miners, what were the strategies adopted by public institutions to combat the effects mining closure, and which were the factors that helped or hindered the redevelopment of communities.

3. RESULTS AND DISCUSSION

Most of the mining communities analyzed are located in rural areas. Out of 383 communities, 305 are communes and 78 are cities and municipalities. They tend to be very fragmented. In 1996, 36% of the communities had under 3,000 inhabitants, 29% of them had between 3,000 and 4,999 inhabitants, while 22% of the localities had between 5,000 and 9,999 inhabitants. In 2015, the number of communities under 3,000 people increased representing 44% of total communities analyzed. 309 out of 383 communities registered population losses between 1996 and 2015, and 74 communities registered population increases. Rural communities were the most affected ones; for

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example there were four communes which lost more than half of their population. The average loss of population for the 309 communities was -15%. The average increase of population for the 74 communities was 7.58%.

The situation is similar when analyzing the change in the number of employees in the mining communities between 1996 and 2015. 280 out of 383 communities registered a decrease in the number of employees, with an average loss of -49.86% between 1996 and 2015. 101 communities faced an increase in the number of employees, with the average increase of 94.46% and the median increase of 46.30%. One community had the same number of employees in 1996 and 2015, while for one locality number of employees is missing for year 1996. Only six mining communities that registered an increase in the number of jobs are located in urban areas. In addition, only 25 out 383 mining communities registered both a population growth and an increase in number of employees between 1996 and 2015.

Between 1996 and 2015 share of youth between 0 and 19 year old decreased from 28.04% to 19.93% in mining communities. This trend followed the trend existing at national level, where the share of people between 0 and 19 year old decreased from 28.57% to 19.97% for the same period of time. In 1996, the percentage of young people was higher in urban mining communities comparatively to rural mining settlements: 30.98% comparatively to 27.29%. In 2015, the difference between urban and rural areas decreased, as the share of youth in total population was similar in urban and rural mining communities, 19.76%, respectively 19.77%.

In 1993, there were 9 mining communities that had more 50% of the housing stock formed of public housing, 20 settlements had between 25% and 50%, while 87 between 5% and 24%. The share of public housing decreased in the majority of the mining communities between 1993 and 2015. In 2015, only 1 locality had over 50% of housing stock formed of public housing, 23 localities had between 5% and 50%, 253 had between 0% and 5%, while the rest of 106 communities did not have any public housing. We can assume that they were sold to the families that occupied them.

When analyzing the influence of the five factors (share of young people in total population in 1996, share of area covered with agricultural land in 1996, share of area covered with forest in 2010, distance from the county seat, and share of public housing in 1993) on the change of population and number of employees between 1996 and 2015, we found the following results (see Table 2).

The analysis shows weak correlation coefficients between population change between 1996 and 2015 and the share of young people (0.373), share of agricultural land (0.185) and distance from the

county seats (-0.209). These results indicate that the larger was the share of young people (0-19 year old) in total population and the share of agricultural land in 1996, the larger was the increase in population between 1996 and 2015. In the same time, communities closer to the county seats faced a larger increase of population. The change in the number of employees between 1996 and 2015 is positively correlated with the share of agricultural land (0.204) and negatively correlated with the area covered with forest (-0.226) and share of public housing (-0.202). The findings indicate that the

larger was the share with agricultural land, the larger was the increase in the number of employees, while the smaller was the area covered with forest and the share of public housing the smaller was the increase in the number of employees. In order to better understand the influence of analyzed factors of the paths of mining communities, we computed correlations between the population change and the five analyzed factors for the counties with the largest number of communities (results are presented in Table 3).

Table 2. Correlation coefficients between the change of population and number of employees between 1996 and 2015 and the five factors analyzed.

	Type of correlation	Population change between 1996 and 2015	The change in the no. of employee between 1996 and 2015
Share of young people	Correl.	0.373**	-0.037
	Sig.	0.000	0.476
Area of agricultural land in 1996	Correl.	0.185**	0.204**
	Sig.	0.000	0.000
Area covered with forest in 2010	Correl.	-0.077	-0.226**
	Sig.	0.135	0.000
Distance from the county seat	Correl.	-0.209**	-0.094
	Sig.	0.000	0.067
Share of public housing in 1993	Correl.	0.015	-0.202**
	Sig.	0.768	0.000

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 3. Correlation coefficients between population change between 1996 and 2015 and the five factors analyzed for counties with largest number of analyzed communities.

	Type of correlation	Alba	Bacău	Bihor	Bistrița-Năsăud	Caraș-Severin	Gorj	Hune-doara	Mara-mureș	Mehe-dinți	Vâlcea
Share of young people in 1996	Correl.	0,514**	0,304	0,584**	0,111	0,371*	0,496**	0,170	-0,79	0,653**	0.499*
	Sig.	0,001	0,236	0,007	0,706	0,028	0,001	0,228	0,599	0,003	0.015
Area of agricultural land in 1996	Correl.	0.615**	0.484*	0.057	-0.380	0.636**	0.165	0.484**	0.182	0.328	0.113
	Sig.	0.000	0.049	0.811	0.181	0.000	0.303	0.000	0.220	0.185	0.606
Area covered with forest in 2010	Correl.	-0.171	-0.233	0.148	0.490	0.531**	-0.173	0.462**	-0.038	-0.307	0.073
	Sig.	0.318	0.367	0.535	0.076	0.001	0.278	0.001	0.800	0.215	0.741
Distance from the county seat	Correl.	-0.395*	-0.282	-0.124	-0.022	-0.274	-0.257	0.397**	-0.316*	-0.151	-0.501*
	Sig.	0.017	0.272	0.601	0.940	0.111	0.104	0.004	0.031	0.550	0.015
Share of public housing in 1993	Correl.	-0.236	-0.344	0.278	0.209	-0.119	0.558**	0.095	0.084	0.107	0.326
	Sig.	0.166	0.177	0.236	0.474	0.496	0.000	0.502	0.577	0.673	0.129

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The results show that the larger was the share of young people in 1996, the larger was the increase of total population (or smaller was the decrease) between 1996 and 2015 in the following counties: Mehedinți (0.653), Bihor (0.584), Alba (0.514), Gorj (0.496) and

Caraș-Severin (0,371). However, the share of young people in 1996 is negatively correlated with the change in number of employees between 1996 and 2015 in Bihor (-0.510) and Maramureș (-0.344) counties. Data shows that even though young people tend to remain in

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the community they do not represent a competitive factor for a mining community to attract investors that would create new jobs.

When analyzing data at county level, the share of agricultural land seems to be strongly and positively correlated with the change in population for counties Caraș-Severin (0.636), Alba (0.615), Hunedoara (0.484) and Bacău (0.484). We can assume that existence in the community of large agricultural areas slowed down the decrease of population, as agriculture provided residents with subsistence income and partially compensated the loss of income from mining activities.

The larger was the share of agricultural land in 1996, the larger was the change in the number of employees between 1996 and 2015 in the case of mining communities from Bacău county (0,786) and

Maramureș county (0,433). The share of area covered with forest is negatively correlated with the change of population, indicating that the larger was the area of forest the smaller was the population increase between 1996 and 2015 for the counties Caraș-Severin (-0.531) and Hunedoara (-0,462). In addition, in the case of Bacău County (-0.633) and Maramureș County (-0.482) the area covered with forest is negatively correlated with the change in the number of employees. Even though the correlation between area with forest and the change of population was not significant for the entire sample of mining communities, it proved statistically significant for some counties. This finding is in accordance with the results of previous studies, which indicate that valorizing forest resources cannot generate the development of a large number of working places and to prevent the out migration of people.

Table 4. Correlation coefficients between no. of employees change between 1996 and 2015 and the five factors analyzed for the counties with the largest number of analyzed communities.

	Type of correlation	Alba	Bacău	Bihor	Bistrița-Năsăud	Caraș-Severin	Gorj	Hune-doara	Mara-mureș	Mehe-dinți	Vâlcea
Share of young people in 1996	Correl.	-0.042	-0.026	-0.510*	0.473	-0.214	-0.031	-0.091	-0.344*	-0.055	-0.280
	Sig.	0.806	0.921	0.022	0.087	0.218	0.849	0.523	0.018	0.828	0.196
Area of agricultural land in 1996	Correl.	0.000	0.786**	0.402	0.123	-0.058	0.154	0.022	0.433**	-0.40	0.174
	Sig.	1.000	0.000	0.079	0.675	0.739	0.337	0.878	0.002	0.876	0.426
Area covered with forest in 2010	Correl.	0.184	-0.633**	-0.280	-0.245	-0.031	-0.046	0.130	-0.482**	-0.077	-0.253
	Sig.	0.283	0.006	0.232	0.389	0.858	0.776	0.359	0.001	0.763	0.244
Distance from the county seat	Correl.	0.079	-0.176	-0.319	-0.309	0.194	0.174	-0.059	-0.304*	0.095	0.072
	Sig.	0.646	0.499	0.170	0.282	0.263	0.278	0.677	0.037	0.708	0.745
Share of public housing in 1993	Correl.	-0.230	-0.406	-0.603**	-0.351	-0.253	-0.227	-0.147	-0.279	-0.200	-0.257
	Sig.	0.177	0.106	0.005	0.218	0.143	0.153	0.299	0.058	0.425	0.236

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Distance is negatively correlated with the change of population in the case of Vâlcea county (-0.501), Hunedoara (-0.397), Alba (-0.395) and Maramureș (-0.316), indicating that the smaller is the distance of community from a county seat, the larger is the increase of population (or smaller is the decrease of population). We found just in the case of Maramureș county a negative but significant correlation between the distance and the change in the number of employees (-0.304). The finding could be explained by the fact that businesses need to have access to support infrastructure, such as major roads, airport, and banks, financial public institutions, markets for products, conditions which are more difficult to meet in remote areas.

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The share of public housing in 1993 is positively correlated with the change of population between 1996 and 2015 in the case of Gorj County (0.558). The finding can be explained by the fact that in Gorj County there are mining exploitations functioning and that attract working force, and the localities where they have a large share of public housing. Share of public housing is negatively correlated with the change in the number of employees in Bihor County (-0.603).

Concluding on the quantitative analysis of the 383 mining communities, we found some partial effects on how the five factors analyzed influence the path of the mining communities after 1996. Hypotheses H1, H3 and H4 were confirmed for the entire sample of analyzed communities; however, the correlation

coefficients are small, indicating a weak relation among variables. When analyzing data at the county level, we found that the change is contextual to particular characteristics of counties. Hypotheses H2 and H5, which were not confirmed for the entire sample, were confirmed at the level of some counties. The influence of the five factors on the change in the number of employees is even more particular to the context of each county. In the case of seven out of ten counties analyzed, we did not find any correlation between the change in number of employees and any of the five factors analyzed. The analysis that we have conducted indicate that the study of the trajectory followed by mining communities should be conducted at smaller scale, in particular at county or community level.

The qualitative research that we have conducted aimed to grasp a better understating on the paths followed by two former mining communities and to better understand the factors that influenced their development. We chose two cities from northern part of the country, from Maramureş County, that were highly dependent on mining, namely Borşa and Cavnic. Borşa is a city of approximately 28,000 people, while Carvnic has around 5,000 residents. The former is further away from the county seat, while the latter is closer to the county seat. In both cities the same type of ore was extracted, and the mining exploitation were closed in the same period. Both cities were eligible for the same programs implemented through Agency for Mining Areas. However, city of Borşa was eligible for more European funds than city of Cavnic. Based on similarities and differences existing between the two cities, we wanted to identify how they developed after the mining exploitations were closed.

Analysis of the factors influencing the paths of the two communities showed a combination of factors specific to each community. In the case of Borşa migration of population to work abroad and the money that these people send home regularly were the most important factors that conferred resilience to the community. Instead, the city of Cavnic had the advantage of a powerful and visionary local leader who promoted the development of tourism. The poor condition of roads was another factor affecting the development of both cities, especially the development of tourism activities. The situation is even more dramatic in the case of Borşa, where tourists were discourage to return in the area due to bad condition of roads even though they were pleased with the touristic experience, as one person interviewed told us.

The large dependence on mining influenced the trajectory followed by both communities as they entered into a state of exhaustion characterized by few employment opportunities. Both communities depended more than 60% on mining exploitation. Both localities face difficulties to diversify local economy, and population leave the communities due to the lack of jobs, especially young population that do not see a future in staying in the community.

The analysis showed that the size of two communities had a different impact on the trajectories of the two communities. The size represented a significant disadvantage for city of Cavnic because it was too small and too close to city of Baia Mare (county seat of Maramureş County) and therefore it was not attractive for investors. In addition, Cavnic could not access European funds because its population size did not make it eligible for Regional Operational Program. For city of Borşa population size did not play a significant role for city development.

Distance of the two localities to alternative labor markets played an important role in the paths followed. City of Borşa being located in a more remote part of the county and at larger distance from other large urban areas was more disadvantaged. Residents of the city did not have access to alternative job markets and therefore in Borşa migration of population abroad manifested more strongly. City of Cavnic which is located 30 km away from county seat was not very attractive for investments in production activities (therefore creating jobs in community), but the proximity offered to some of the residents, who were willing to commute daily, access to additional jobs.

In both places the topography influenced in the same way the degree of resilience of the two communities. On one side, the topography discouraged investors because none of the two towns had large enough plots for greenfield investments, and the topography did not allow widespread farming. Instead, the landscape created the opportunity for the two towns to develop tourism sector. Borşa already had a tradition in this field (being a tourist destination of local interest) and residents saw the beauty of the area to invest money earned by working abroad; so many people invested in building bed and breakfast pensions in the expectation that this areas would develop. City of Cavnic had to start from zero the tourism development, but the city had the advantage of a better climate during winter for practicing skiing (with lower temperatures and significant precipitation falls).

The type of ore extracted did not played a significant difference for the paths taken by two communities. In both places the same type of ore was extracted, extraction method was the same and mines' closure was made in the same way. However, the quality and quantity of reserves unexploited might make a difference for future development of cities. City of Cavnic has rich reserves of minerals which could be exploited in a more favorable context and the city could become an important mining center again. In Borşa the ore did not have a high concentration of metals as in Cavnic, and therefore there are fewer chances that mining exploitation could be reopened. A factor that played an important role in the redevelopment of

Cavnic was local leadership that had a clear vision on how city should be regenerated. The city had a mayor for 12 years that saw in tourism the only opportunity for regenerating the city and was committed to materialize his vision. The mayor benefitted from the support of residents and local council, and he hold the mayoral position long enough to implement the projects aimed to transform the city in a tourist destination. Instead, city of Borşa lacked a strong and committed leader to the transformation of the city, and even more important it lacked a shared vision on the future of the community. Even though the city developed in the years that followed mine closure, the development was a reaction to the requests of people that left the community to work abroad and who sent regularly money back in the community for their families. Their money kept local economy alive, and not the planned actions of local municipality.

4. CONCLUSIONS

The destiny of mining communities from Romania was largely shaped by their development during the communist regime. Many of them grew as mono-industrial communities with few opportunities to diversify local economy. In some cases, they were developed around mining exploitations of poor quality ores, with underperformed equipment that generated many financial losses. The number of employees in the mining sector exceeded the personnel requirements, and it was a way to mask unemployment existing in the country. In this context, after the fall of communist regime it was no surprise that mining companies started to accumulate losses, and the need to reduce them was a logical argument to close most of the mining exploitations across the country. However, the generous redundancy salaries offered to miners to voluntarily leave their workplace could not overcome the social consequences generated by an unplanned decision to restructure the mining sector. Lacking financial knowledge on how to manage the money for crossing the transition period and lacking the support infrastructure for investing the money, former miners quickly spent the redundancy salaries and they continued to represent a pressing social problem for public institutions. The programs implemented to combat social consequences had all the components to slow down the decline mining communities; however, they were implemented with delay.

The present study analyzed the characteristics of mining communities from Romania in order to identify the influence that some factors had on their path after the restructuring of the mining sector. The study showed that most of mining communities are small rural localities, and that the majority of them lost population and working places. We found that in some of the analyzed communities existence of larger areas covered with agricultural land did matter and positively influenced population growth. The area covered with forest negatively influenced the development of some mining communities, in the sense that it slowed down the population growth. Distance from the county seat negatively influenced the growth of some settlements, as the larger was the distance from the county seat the smaller was the population increase and number of jobs growth. These results indicate that settlements located in mountain areas and at larger distances from a large urban center are in more distress and therefore additional governmental programs should be directed for their support. The age distribution of population does matter, and our study indicated that the share of young people in total population is important for population change. The study also showed that in the case of one county population decreased at a higher rate in communities with higher share of public housing. These findings indicate that planning the community development ahead of opening a mining exploitation is essential for its future development. A mining settlement should be planned not for the lifespan of the mine, but also for the period after the mine reduced its activity. Therefore, selling public houses to former miners at lower prices multiply the social problems that communities face by keeping in the community people with few opportunities for findings jobs, and therefore being dependent on social assistance programs provided by local public institutions.

When analyzing in more details the paths of two former mining cities from Romania we could better understand which were the factors influenced their redevelopment, and we showed that factors can have mixed effects. For example, distance from an urban center can represent both an advantage and a disadvantage. We identified more nuances when restating the importance of community size for redevelopment opportunities; smaller cities are less attractive for investors, but they are even more disadvantaged in Romania when it comes to access to European funds. We also could grasp a better understanding about the importance of young population for a community. Even though this segment of population is important for population growth and economic development, the study showed that they still can bring a significant contribution when leaving the community to work abroad. The money that they send back home to their families were important for keeping local economy functioning and to put a pressure on local administration to provide better quality services for local residents. Local leadership proved to be essential in driving the change in one of the communities analyzed, but it is a factor more difficult to nurture through governmental programs.

Mining communities have particular characteristics that require redevelopment policies adapted to local conditions. Some conditions are fixed (such as topography and location) and are more difficult to act upon, while other conditions can be

changed when there is clear understanding of how they work. The findings of our research indicate that public institutions should support more strongly small rural communities situated at larger distance from county seats, especially those communities located in mountain areas, since they tend to decline more rapidly comparatively with other settlements. Policies should be designed to keep young population in the community by improving educational conditions in rural areas and reducing school dropout. They should be supplemented with additional programs directed to improve the living conditions and to stimulate the creation of working places, including the support of local entrepreneurs, in rural areas. On long term, the development of second rank cities as economic centers should be strengthening as the present study showed that the proximity to a major center plays an important role for community development. However, the longer is the time frame between the mining restructuring and when the redevelopment policies are implemented, the chances are smaller that they will succeed to slow down the decline of the communities. Therefore, the best moment for preparing a mining community for restructuring is when a decision is made to start a mining exploitation (Radu, 2015). The housing and employment policies should be designed in order to reduce the impact of mine closure on the community.

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