

Impact Assessment Extraction of Minerals on Social and Economic Situation of the Population in Selected Micro-Region

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Abstract

This paper deals with impact of extraction of mineral resources for the social and economic situation of the population in selected micro-region Jelšava. Together with the city Jelšava as part of the selected micro-region were reviewed and adjacent villages Chyžné, Lubeník, Magnezitovce, Mokrá lúka and Revúcka Lehota. The selected micro-region has a combined population of 6,296 and is located on an area of 10,939 ha. For the impact assessment was necessary to assess the current state of socio-economic situation of the selected micro-region. In selected micro-region is currently being implemented and magnesite extraction company currently engaged in the extraction of magnesite has a decisive influence on the social and economic situation in the selected micro-region because they are crucial employers in this area. Any industrial activity in the region has the positive effects but also negative effects. Among the positive effects belongs increase in employment, an increase in average wages, improve the demographic situation etc. Among the negative effects we can include main impacts on the environment, human health, occupation of land, waste production, the emergence of environmental burdens etc. Extraction of raw materials is an area that brings with it a fairly significant negative impact on the environment. Therefore, it is necessary to connect these two areas and the area of socio-economic and environmental area. On the relationship between those two areas and a comprehensive assessment can be used chain of D-P-S-I-R. Just such chain can be used to assess state of the environment and know the causal-follow relations between human activities and the state of the environment.

I. INTRODUCTION

Extraction of mineral resources accompanies our company from the oldest historically dated period to the present. [7] Any industrial activity brings with it a number of positive impacts in several areas, but and the quantity of negative impacts which impact on the environment and occupational environment people and thus affect their quality of life. [1]

Extraction of mineral resources and mining industry is a global industry which brings relatively significant environmental impacts. On the other hand, are mineral resources and technological progress while irreplaceable inputs to production and thus the need for the objective

reality. Therefore, the extraction of raw materials at the same time promising sector of industry. [3]

Of course the development of raw material extraction with them can contribute significantly to improving the socio-economic situation in the head area with high unemployment or regions with less developed infrastructure. [9] Extraction of mineral resources brought to our country's prosperity, development of new urban agglomerations, development of technology and progress in drafting legislative codes. [2]

In particular, for small municipalities and less developed regions are an important source of mining companies for development - as budget revenue, but also as a source of extra budgetary income (sponsor donations, help build infrastructure). [8, 10] Beyond the extraction can bring wider social and economic effects in the form of new jobs, increase in average wages, improvement of demographic trends, to improve infrastructure in the region. [8]

II. CHARACTERISTICS OF THE REGION

One of the economically most important mineral resources in Slovakia is magnesite. The largest bearings of magnesite in Slovakia are situated in the carboniferous strata in the western Carpathians in Gemericum. Chemically pure, uncontaminated magnesite $MgCO_3$ contains 47.8% MgO and 52.2% CO_2 . The following composition is usually rare. Most often it contains various additives such as carbonates, oxides, Silicate mainly calcium, iron, manganese and aluminum. Exploit magnesite deposit in Slovakia have relatively consistent quality with an MgO 40.2 to 43.5%, Fe_2O_3 fluctuate between 1.5-4%, CaO from 1.5 to 4.8%, SiO_2 0.7 to 2.5% MnO 0.1-0.4%. Currently, the extraction of magnesite carried out on two bearings underground manner. Bearing in Jelšava is the largest Magnesite deposits in the world. Among the most important and largest bearings are Jelšava - Dúbravský masív, which magnesite conquers from depths exceeding 400m below the surface. [5]

Jelšava city is situated at the interface of Slovak Karst and Slovak Ore Mountains. It has a rich tradition of mining and iron as well as artisanal production. [5] Jelšava is located on the international tourist route Gothic Road, is situated 12km southeast of Revúca districts and

belongs to the Banská Bystrica region. Geographical location of the city is 48 degrees 37 minutes' north latitude and 20 degrees 14 minutes' east longitude, at an altitude of approximately 258m. Jelšava the area has an area of 4,679 hectares, of which 296 hectares' urban area, rural area 4,383 hectares.

Micro-region Magnesite voluntary association of municipalities, which was founded in 2003 [5]:

- Chyžné
- Lubeník
- Magnezitovce
- Mokrá Lúka
- Revúcka Lehota
- Jelšava

III. SLOVAK MAGNESITE WORKS, A.S. JELŠAVA

Slovak Magnesite Works (SMW) Fig. 1 in Jelšava is the greatest mining and a processing magnesite plant in Slovakia and one of the world's largest producers of magnesite dead on. Today it is owned by the Slovak Magnesite Works, joint stock company, Jelšava. He has already completed more than 120-year history. [6]



Figure 1. Slovak Magnesite Works, a.s. in Jelšava

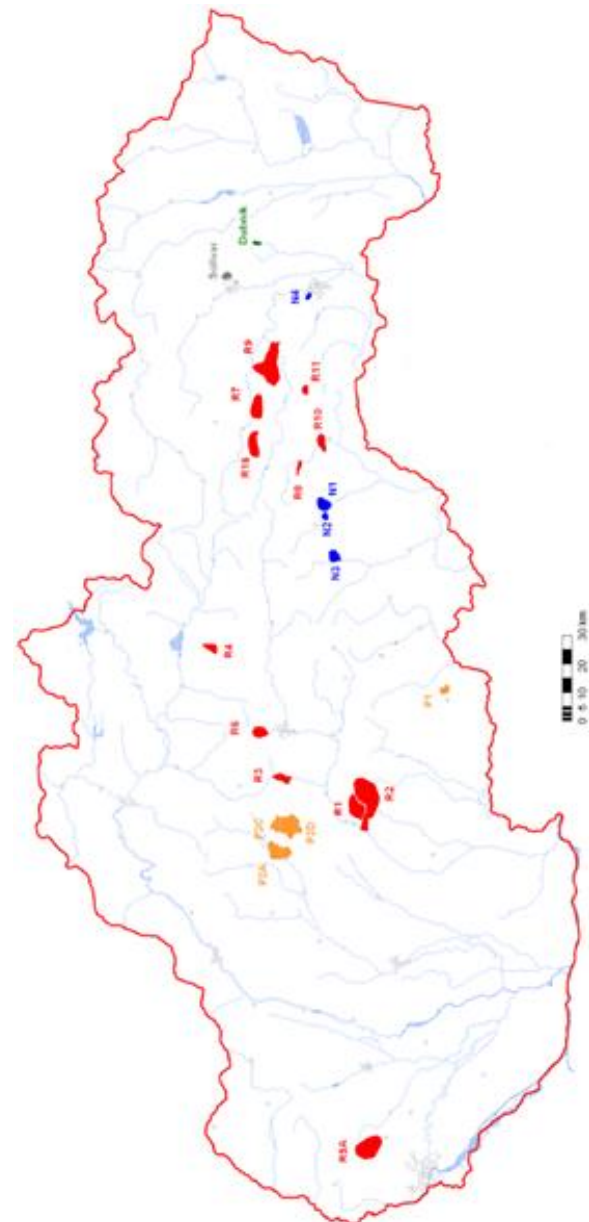
Magnesite Fig. 2 is the most important mineral magnesium. It occurs in nature in crystalline and massive form. Both types of magnesite are mainly used for caustic clinker producing the refractory mass and insulation. It is used in the chemical industry for the manufacture of paper, rayon and like putty abrasive grinding wheels. [6] The most significant Bearings are located in a strip for about 70km long from Podriečan (Banska Bystrica region) after Ochtiná, further in a section Margecany - Košice. Magnesite is currently mined outside the Košice region on bearings Lubeník, Jelsava et al., In the Kosice region undrawn deposits are located in Ochtiná and Košice - Bankov. Non-balanced occurrences of crystalline magnesite in the areas of Vlachovo, Gemerská Poloma, Mníšek and Hnilcom.



Figure 2. Magnesite

IV. CHARACTERISTICS IMPACTS OF EXTRACTIVE INDUSTRIES ON THE ENVIRONMENT IN SELECTED MICRO-REGION

Mineral resources constitute the basis of production in metallurgy, electrical, chemical, construction, ceramic and glass industry, as well as in other industries. Essential part is of non-metallic extraction, construction and energy raw materials. [11] The production of most non-metallic and construction raw material (magnesite, limestone, dolomite, gypsum, stones and others). Essentially cover their domestic consumption. In Slovakia there are several sites which perform extraction of raw materials see Fig. 3. The right area of micro-region Jelšava is one of those areas [6, 12].



Designation of locations: P1 – Veľký Krtíš, P2A- Nováky, P2C – Čígeľ, P2D – Handlová, N1 – Jelšava, N2 – Lubeník, N3 – Hnúľ'a-Mútnik, N4 – Košice Bankov, R1 – Banská Horuša, R2 – Banská Štiavnica, R3 – Kremnica, R4 – Liptovská Dúbrava, R5A – Pezinok, R6 – Špania Dolina, R7 – Rudňany, R8 – Nižná Slaná, R9 – Slovinky, R10 – Rožňava, R11 – Smolník, R16 – Novoveská Huta

Figure 3. Intensely affected by the production site in Slovakia

TABLE I.
STATE AND DEVELOPMENT OF THE ENVIRONMENT IN THE SELECTED
MICRO-REGION [12]

| State | 13. Energy raw materials | | |
|--------------------|----------------------------------|---|--|
| | The count deposit reserves | 14. | Ore minerals |
| Underground water | 15. | Non-metallic and construction materials | |
| | 16. | Non-reserved minerals | |
| | 17. | Groundwater supplies | |
| | 18. | Geothermal energy | |
| | Geological environmental factors | 19. | Landslides and slope deformation |
| | | 20. | Tectonic and seismic activity area |
| | | 21. | Radon activity in the geological environment |
| | | 22. | River sediments |
| | | 23. | Stability of rock massifs |
| | Consequence | 24. | Old environmental burdens |
| 25. | | Heaps | |
| 26. | | Tailings ponds | |
| 27. | | Soil contamination | |
| Risks and diseases | | 28. | Accidents, injuries and occupational diseases in mining activities |
| Air pollution | | 29. | PM2,5 emissions from industry |
| | | 30. | PM10 emissions from industry |
| The waste water | | 31. | Wastewater discharges from industry |
| Waste production | | 32. | Development of industrial waste |

V. SOCIAL ASPECTS OF RESOURCE EXTRACTION

Slovak Republic on a global scale not one of the countries in which the extraction and processing of raw materials more striking is involved in the creation of employment. [4] In 1989 in the mining and mineral processing employed a total of 36,950 employees, including 14,305 in coal mining industry, 9,959 in ore mining, 5,068 in magnesite industry, 6,309 in mining of building materials and raw materials for production of building materials and 1,309 in oil and natural gas, including underground storage. [13]

Since 1990, the number of employees in this sector falling sharply, which is related to the realization of the program attenuator in extractive industries sector and transformation processes and the country's gradual transition to market economy principles. In 2003, the mining and mineral processing were employed a total of 15,455 employees, including 6,355 in the coal mining, 981 in ore mining, 3859 in magnesite industry, 3,246 in the extraction of industrial minerals and raw materials for production of building materials and 1,014 in oil and natural gas, including underground storage. When compared to 1989, the number of employees in the mining and mineral processing in 2003 fell by a total of 21,495 employees. [4]

Location exploited mineral deposits is the geological conditions of their creation, and this implies the irregularity in distribution of employees involved in the extraction and processing of mineral resources in the regional breakdown. Compared to regions poor in raw materials there are regions of relative rich in their occurrence and it also corresponds to the regional infrastructure and employment. Market liberalization and

transition to market economy principles after 1990 led to the decline of mining, respectively. to the closure inefficient of establishments, which was significantly reduced employment in the mining regions without a corresponding compensation for new jobs. This new trend in the use of raw material base in Slovakia significantly befell in particular regions with a long mining tradition (Spiš, Gemer, Banská Štiavnica). In view of the current trend in the use of domestic raw material base and without opening new deposits in particular non-metallic minerals cannot be assumed in the near future substantial increase employment in this sector. On the contrary, by opening inefficient mines can be expected to further decline in employment in this sector.

The company SMW Jelšava, a.s. are among the most important employers in the district Revúca, which maintains about 1,000 direct job positions. At the same time as the road and rail transport, further in the services sector, goods and raw materials or produces. keeps more jobs, resulting in significant economic and social benefits for the region. [4] In Fig. 4 are represented shares of the most important companies in the Banská Bystrica region from the perspective of number of employees. The graph shows that the company SMW Jelšava, a.s. and Slovmag a.s., Lubeník collectively contribute 13% and currently represent the largest employers in the district Revúca.

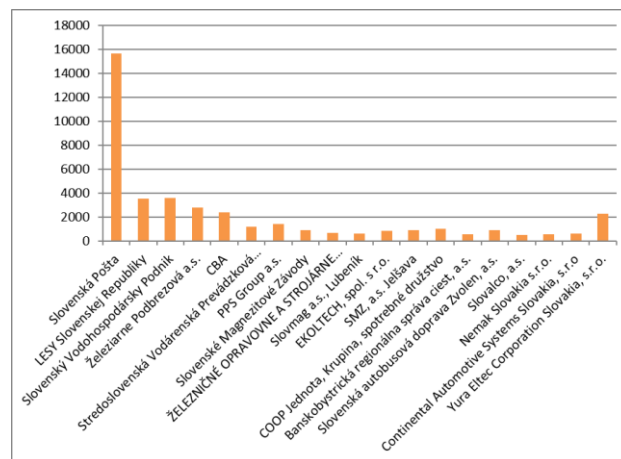


Figure 4. The largest companies with of view the number of employees in the Banská Bystrica region

In the following graphs show evolution of the number of employees, educational and age structure of employees SMW Jelšava, a.s. In Fig. 5 shows the development of average wages of employees SMW Jelšava, a.s.

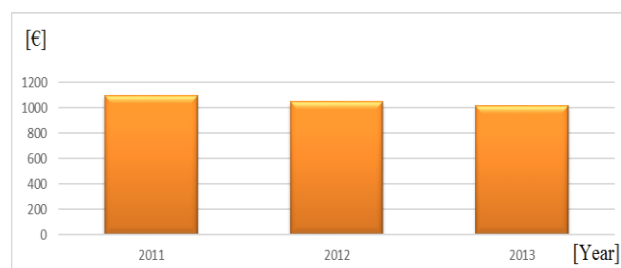


Figure 5. Number of employees

Average earnings is the following Fig. 6.

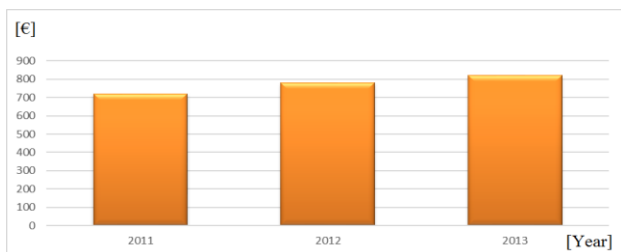


Figure 6. Average earnings (€)

Employee education structure is the following Fig. 7.

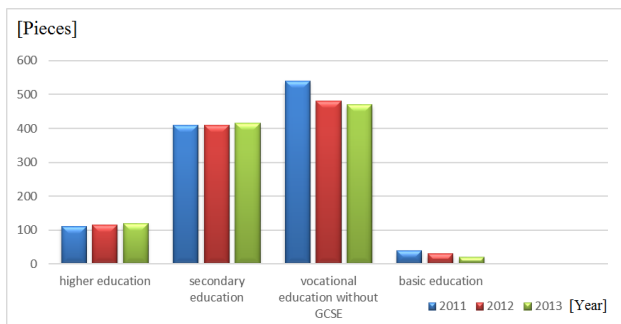


Figure 7. Employee education structure

In Fig. 8 is presented in registered unemployment rate in the district Revúca. This indicates a significant reduction trend of unemployment in the district Revúca in the last three years.

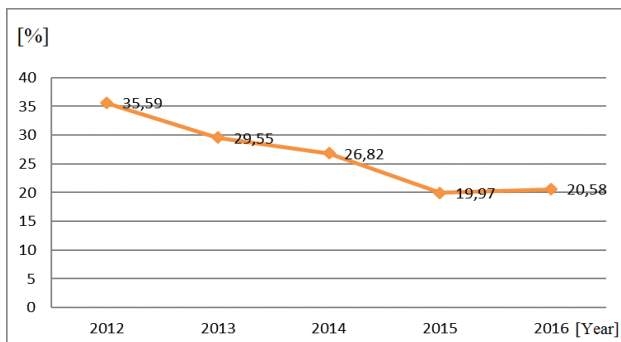


Figure 8. Unemployment in the district Revúca

In Fig. 9 trends in the number of unemployed in Jelšava with a slightly falling trend.

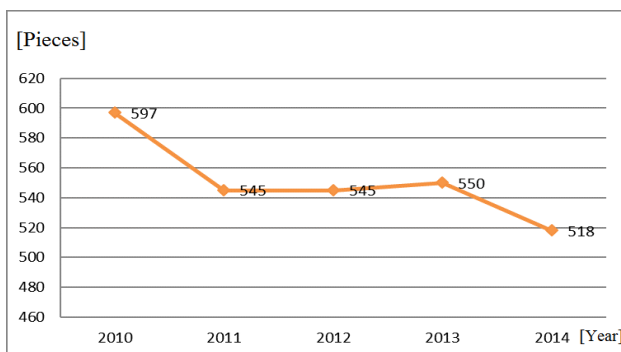


Figure 9. Development number unemployed in city Jelšava

In Fig. 10 shows the development of average wages in the district Revúca, and now the amount is 784€. Compared with an average height of payroll wages SMW Jelšava, a.s. is lower by about 60€.

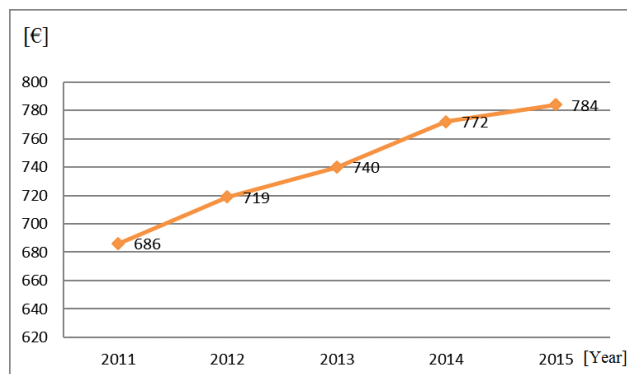


Figure 10. Height the average wage in district Revúca

CONCLUSION

The paper is aimed at assessing the impact of resource extraction on the environment and socio-economic situation of the population of the selected micro-region. For the purposes of preparing the article was elected region in Jelšava. The selected region has a long tradition in the extraction of magnesite, whereas this region contains up to 8% of global reserves of magnesite. The selected regions are among the less developed regions in Slovakia and it is mining industry has a dominant position in this region. The presence of extractive industries in this region brings with it for a particular micro-region positive and negative aspects. Among the positive aspects are, of course, economic benefits in the form of tax payments, employment, wage levels and the overall development of the region. Among the negative impacts we advise the main impacts on the environment and on public health. This negative impact cannot be the whole story, on the other side, mineral resources are also present for technological progress, irreplaceable inputs to production and there is a need for an objective reality. Therefore, the extraction of raw materials is essential from a global perspective and is a promising sector of industry.

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