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Editors:
Ljubiša Balanović
Dejan Tanikić

18-21 October 2023, Bor Lake, Serbia

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PREFACE

On behalf of the Organizing Committee, it is a great honor and pleasure to welcome all esteemed participants of the 54th International October Conference on Mining and Metallurgy (IOC 2023), scheduled to take place at the picturesque Bor Lake, Serbia, from October18th to 21st 2023.

The collaborative efforts of the University of Belgrade, the Technical Faculty in Bor, and the Mining and Metallurgy Institute Bor have meticulously organized this year's IOC. Our focus remains unwavering on showcasing the latest research findings and advancements in geology, mining, metallurgy, materials science, technology, environmental protection, and other engineering disciplines. Our primary objective is to foster a dynamic environment where academics, researchers, and industry professionals can come together to share their knowledge, experiences, and innovative ideas while exploring opportunities for collaborative research endeavors.

Our conference agenda is rich and diverse, encompassing plenary sessions, engaging invited lectures, technical presentations, enlightening oral and poster sessions, informative technical tours, a diverse exhibition, and memorable social gatherings. At the heart of this event lies our strong commitment to sustainable development within the mining and metallurgy sector. We are dedicated to exploring ecologically conscious methodologies, responsible resource extraction practices, and cutting-edge technologies that reduce the industry's environmental impact and enhance the well-being of local communities.

The conference proceedings comprise 129 papers authored by individuals from universities, research institutes, and industries in 22 countries. We are proud to welcome participants from Bosnia and Herzegovina, Bulgaria, Canada, China, Croatia, Germany, Greece, India, Iran, Kazakhstan, Libya, North Macedonia, Montenegro, Morocco, Romania, Russia, Slovakia, South Africa, Spain, Turkey, United States, and, of course, Serbia.

We are excited to host the 8th International Student Conference on Technical Sciences (ISC 2023) as part of IOC 2023. This event offers students from Serbia and the wider region a unique chance to showcase their research and discuss the future of their fields with experts.

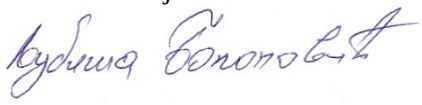
We sincerely thank the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia for their generous financial support. In addition, we express our profound gratitude to all our sponsors, exhibitors, and friends of the Conference for their contributions and unwavering support for playing a pivotal role in ensuring the success of IOC 2023.

We would like to express our heartfelt thanks to all authors, committees, reviewers, speakers, and chairpersons for their invaluable contributions in shaping IOC 2023.

We look forward to welcoming you to the 55th International October Conference on Mining and Metallurgy (IOC 2024), which will be held in October 2024.

On behalf of the 54th IOC Organizing Committee,

Prof. dr Ljubiša Balanović



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LAND TURNOVER INCREASES DUE TO MINING: AN EMPIRICAL ANALYSIS OF BOR, SERBIA, 2013-2022.

Ivica Nikolić, Isidola Milošević, Anđelka Stojanović

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Abstract

This study examines whether the turnover of land near the mine or land used for the purposes of the mine is increased compared to land outside the mining area. In addition, this paper presents the land turnover after the privatization of RTB Bor by the Chinese company ZiJin Mining Grupe in 2018. For this research, public data from the website of the Geodetic Authority of the Republic of Serbia was used. The study showed that the turnover of land near the mine and for the needs of the mine is several times higher than the turnover obtained outside these areas, except in the area of Lake Bor. In addition, the impact of the increase in traffic and other real estate, especially residential, was observed following the increase in mining activity. This analysis shows the positive impact of mining on land turnover in the city of Bor.

***Keywords**: land turnover, mining, empirical analysis*

1. INTRODUCTION

Bor is located in the east of the Republic of Serbia. It consists of the central settlement, which is the seat of the Municipality of Bor, and 13 villages (Gornjane, Tanda, Luka, Krivelj, Bučje, Oštrelj, Donja Bela Reka, Brestovac, Slatina, Zlot, Šarbanovac, Topla, Metovnica). The Municipality of Bor consists of 19 cadastral municipalities, with the urban settlement of Bor divided into two cadastral municipalities, Bor I and Bor II and the village of Zlot divided into five cadastral municipalities. Zlot I, Zlot II, Zlot III, Zlot IV and Zlot V. According to the data of 1844 there were 54 houses and 230 inhabitants [1, 2]. The faster development of Bor began in 1903—the year after the discovery and exploitation of copper ore. The copper mine changed hands. From 1903-1940, it was owned by French companies. After that, from 1941 to 1944, it was owned by Germany. After liberation, it became state property, where the Mining and Smelting Basin Bor - RTB-Bor was created. It remains in state ownership until 2018. After signing the contract on the acquisition of 63% of ownership by the Chinese company Zijin Mining Group, Chinese capital takes over the leading position. This change in the ownership structure contributes to the expansion of mining capacity, which is reflected in the need to purchase land to explore and exploit copper ore. In this way, there is a direct increase in land turnover in cadastral municipalities that are suitable for mining, but also an indirect turnover with the aim that former landowners want to buy land in a new location. This paper presents an empirical analysis of the impact of mining on the increase in land turnover in cadastral areas where mining is active, as well as the influence of Chinese capital on the increase in turnover after privatization [3, 4, 5].

2. EMPIRICAL ANALYSIS

On the website of the Republic Geodetic Institute of Serbia, every transaction of real estate is recorded for public inspection. Through empirical analysis, in Table 1, data for 19 cadastral municipalities in the city of Bor for ten years were presented, five years before the privatization of the Chinese company ZiJin and five years after the privatization in 2018, that is, from 2013-2022. Also, Figures 1-7 show an atypical real estate transaction caused by the purchase of a Chinese company for mining purposes.

Table 1 - Land turnover by year by cadastral municipality for the period 2013-2022 [2].

Number of turnover per year											
Cadastral municipality / year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	∑
Bor I	11	10	5	10	12	8	8	16	16	24	**120**
Bor II	5	3	3	1	3	2	2	2	9	19	**49**
Brestovac	75	44	42	79	72	76	63	82	108	92	**733**
Bučje	18	6	5	1	2	6	6	9	139	49	**241**
Gornjane	9	17	6	5	6	12	7	10	7	16	**95**
Donja Bela Reka	9	15	2	5	23	28	8	35	13	39	**177**
Zlot I	2	2	4	2	2	0	0	3	7	6	**28**
Zlot II	6	3	1	6	4	5	4	5	8	12	**54**
Zlot III	7	3	2	2	5	5	5	9	10	9	**57**
Zlot IV	10	7	11	2	4	3	7	6	4	10	**64**
Zlot V	8	10	12	3	4	3	4	8	8	13	**73**
Krivelj	17	7	1	8	13	12	20	33	75	146	**332**
Luka	5	1	2	2	3	1	2	2	0	4	**22**
Metovnica	8	5	4	7	4	13	6	3	4	1	**55**
Oštrelj	18	3	2	5	6	12	9	1	9	6	**71**
Slatina	5	7	4	6	68	221	39	24	79	127	**580**
Tanda	5	1	0	3	0	0	0	1	1	0	**11**
Topla	0	0	0	0	0	1	1	0	0	0	**2**
Šarbanovac	10	11	11	8	9	10	3	10	14	17	**103**
∑	**228**	**155**	**117**	**155**	**240**	**418**	**194**	**259**	**511**	**590**	**2867**

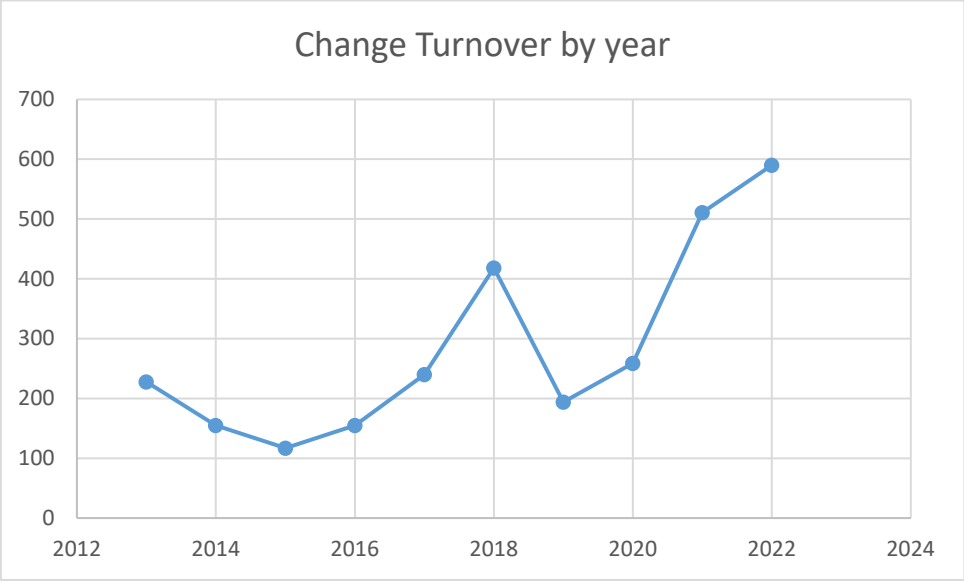

Figure 1 - Land turnover in the period from the beginning of 2013 to the end of 2022 [2].

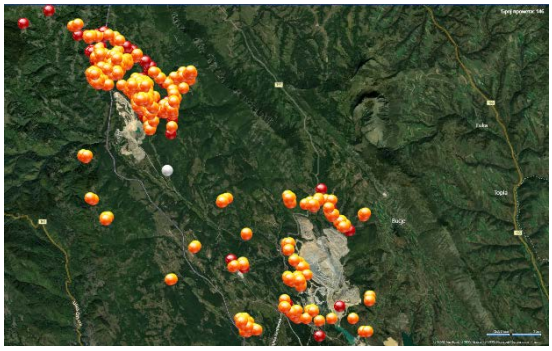

Figure 2. Land turnover in 2022 in the cadastral municipality of Krivelj [2].

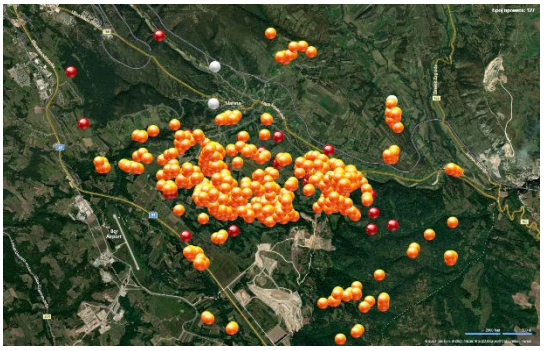

Figure 3. Land turnover in 2022 in the cadastral municipality of Slatina [2].

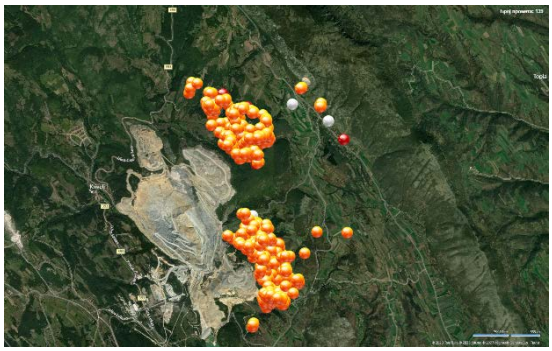

Figure 4 - Land turnover in 2021 in the cadastral municipality of Bučje [2].

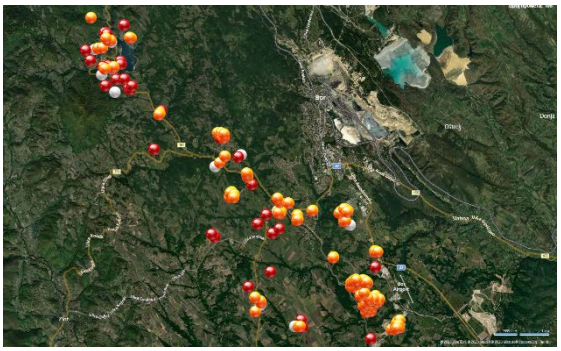

Figure 5 - Land turnover in 2021 in the cadastral municipality of Brestovac [2].

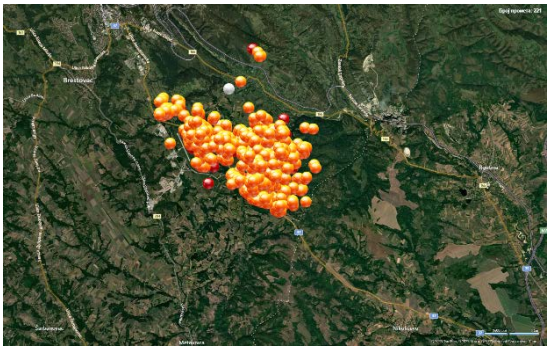

Figure 6 - Land turnover in 2018 in the cadastral municipality of Slatina [2].

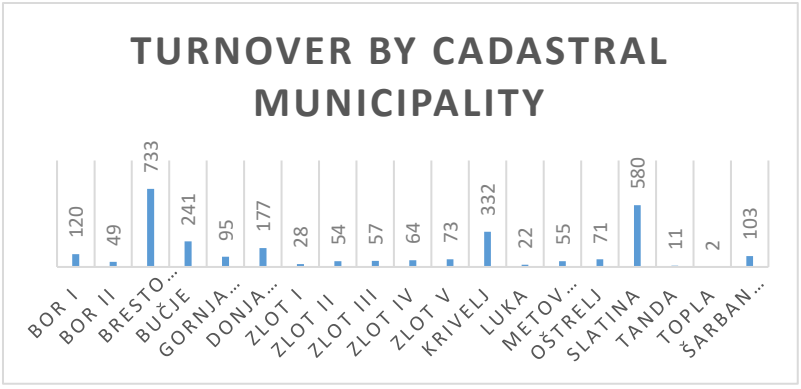

Figure 7 - Land turnover in cadastral municipalities in the period from 2013-2022 [2].

3. RESULTS AND DISCUSSION

The research results show that mining activities significantly impact land turnover in the municipality of Bor. Also, after privatization, the number of realized land transactions increased significantly. In the observed period, the most considerable land turnover was realized in 2022, with 590 changes, as seen in Figure 1. The highest turnover was realized in the cadastral municipalities of Krivelj (146 changes) and Slatina (127 changes), with the largest part of the land being purchased for mining. What can be seen in Figure 2 and Figure 3. Also, it is interesting to note that no turnover was achieved in the cadastral municipalities where mining and industry are not represented. The next most represented year in land turnover is 2021, with 511 changes realized, the most in the cadastral municipalities of Bučje (139 changes) and Brestovac (108 changes), which is shown in Figures 4 and 5. In cadastral municipalities Bučje, the largest turnover was achieved by the Chinese company Zijin for mining needs, while in the municipality of Brestovac, the purchase of land from the company was halved. In this cadastral municipality, there is a turnover of land purchases around Lake Bor by individuals. Also, a significantly high turnover was achieved in 2018 in the cadastral municipality of Slatina (221 changes), where the largest share of land acquisition was for mining, which can also be concluded from Figure 6. Figure 7 shows the turnover of land by cadastral municipality. It can be concluded that cadastral municipalities with significant mining activity are significantly ahead in land turnover compared to cadastral municipalities in which mining activity does not exist, such as Topla and Tanda.

4. CONCLUSION

Based on the empirical research and the results presented in this paper, it can be concluded that mining activities in the territory of the city of Bor have the most significant impact on land turnover. The highest land turnover was experienced in cadastral municipalities directly affected by mining, such as Slatina, Krivelj, Bučje and Brestovac. The cadastral municipality of Brestovac is in the lead because, in addition to the purchase of land by a Chinese mining company, there is also a significant turnover of land for the construction of houses and cottages near Lake Bor. Also, the privatization of the state company RTB Bor by the Chinese company in 2018 greatly increased the turnover of land in the territory of the city of Bor.

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