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Article

The effect of hard coal activities on space production – Zonguldak Üzülmöz Valley

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ABSTRACT

According to his studies on the production of space, Lefebvre mentions that each production method produces a new type of space, and this production rises on three constituent feet. Different indicators in the perceived, conceived and living dimensions of the space are essential to understand the truth of the space and determining its potential and handicaps. Also, spaces with different histories have different production histories in line with their living dynamics. Considering that each space has its own production history, the necessity of evaluating the production in the mining city with underground and ground distinguishes these settlements from the others. Production targets shape the required workforce, the workforce shapes the infrastructure and superstructure demands, and the infrastructure and superstructure demands shape the morphological structure. This study aims to reveal the relationship between space and meta production in the coal production city Zonguldak. Based on space production and related theories, the space production periods and space triad of Zonguldak have been determined. As Lefebvre mentioned, the deepening contradictions of abstract space have revealed the contradictory space period. The contradictions that exist in Zonguldak are based on the tense relationship between underground hard coal production techniques and space production shaped by changing policies on the ground. Therefore, from the past to the present the contradictions and tense relationship between meta and space production in Zonguldak have been explained through specific examples of the city. In conclusion, the change of meta and space production, which continues at different scales on the ground and underground, is explained through specific variables and conceptual and physical tensions that occur on the surface of the city are defined.

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INTRODUCTION

Lefebvre states that space is a social product and is constantly being reproduced in the historical process, and this production has special values for each community (Lefebvre, 1991: 377). If it is thought that each community has its distinctive sensing and evaluation processes, the space can also be said to differentiate as a social product. Lefebvre points out that the space has risen on three constituent feet. He is stating that by means of these constituent feet, the space can be descended into the truth, and it is a social reality (Lefebvre, 1991: 115). Proceeding from all these postulates, if each space bears its own distinctive values, the space production of the mining city is the integrated story of underground and ground. Today's Zonguldak basin, which is surrounded by an absolute nature until the discovery of hard coal, has a developing space layout that depends on hard coal production. Production, that is ongoing under the ground, has exhausted the ore belonging to the absolute and has given rise to a generation of new spaces above the ground. In this sense, Üzülmöz Valley, which is one of the city's first production zone, is an example of which underground and ground productions can be observed holistically that is specific to a mining city. From the past to the present, the identification of the relationship between meta and space production as a social reality is in a key role to explore the reality of the mining city. It is important to explain the spatial-constitutive indicators, the spatial periods and the contradictions that emerged between the periods to discover the differential feature of the urban surface.

PRODUCTION OF THE SPACE – PERIODS AND SPATIAL TRIAD

For capitalism, the value of change is important rather than the use value of the space. Hence, space's historical production, usage and the values that are represented by it are not important for capitalism. Two places, whose histories are very different from each other, are abstract parcels or buildings that can be bought and sold in the market in terms of capitalism (Şengül, 2001: 15). Lefebvre presents a broad perspective on the subject by stating that space is not only an abstract and material object, but also has an ideological, living, and subjective structure. He focuses on the social context and the process of production rather than evaluating the space within itself (Turut & Özgür, 2018). Also, he states that space is a social product and has historicity due to the production process (Lefebvre, 1991: 26). Lefebvre's space theory structurally consists of two main frames that are associated with each other. These are the periodisation of space and the spatial triad. The spatial triad can be completely comprehended when it is considered together with space periodisation

(Ghulyan, 2019: 2). He defines space characteristics for each production style by dividing the space into periods (Shields, 2005: 170). According to that space refers to production relations such as "absolute space" hunting and gathering and neolithic agriculture, "sacred space" Asian-type production and feudalism, "historical space" ancient or classical production, "abstract space" early capitalism and "contradictory space" late capitalism. The *differential space* is Lefebvre's utopia as the collective and communal unity of communism, which acquires meaning through differences and experiences (Boer, 2005: 123).

Periods of Space Production

According to Lefebvre, the origin of the social space is based on the *absolute space* of nature (Lefebvre, 2014: 245–246). The most important feature of *absolute space* is the shaping and harmonisation of human life with the rhythms of nature. Since the production activities of people during this period continued based on the rhythm of nature the process of transforming the space from its natural context into a conceived space could not be realised (Ghulyan, 2017: 5–6). The abstract space of capitalism arises in the artistic phrases of Picasso (Lefebvre, 1991: 301–304) as well as modern architects (Gropius, Mies van der Rohe, Le Corbusier, etc.). Its characteristic is being homogeneous and fragmented. In this sense, Lefebvre states that Hausmann produced homogeneity for the new order and divided the space into fragments, but despite this partition, there is integrity (Shields, 2005: 176). Lefebvre defines abstract space as something that enables capitalist manufacturing, distribution and consumption processes (Stanek, 2008: 75) and abstract space is the field of exchange value (Gregory, 1994: 402). As a result of further capitalist developments, the contradictions of the abstract space further deepened and initiated the process of *contradictory space*. The abstract space has been named as a *contradictory space* in terms of its attribute and quantitative characteristics, and deeper contradictions have become more visible compared to the past (Ghulyan, 2017: 17–21).

Contradictions of the abstract space can be explained as the contradiction between quality and quantity, global and subdivided and centre and periphery. At the core of the contradiction between quality and quantity, there is the contradiction between usage and exchange values. The geometric representations of the space serve the quantisation process and allow the fragmentation of the space as parcels (Lefebvre, 2014: 353–357). Another contradiction is the contradiction between global and subdivided. Aside from the global perspective, a space divided by different processes can also be mentioned. It refers to structuring from state and administrative boundaries on a macro level and to urban parcels on a micro level (Ghulyan, 2021: 20). This fragmentation is always for exchange and sale (Lefebvre, 2014, 358). As a result of the contradiction between

the global and subdivided, the contradiction between the centre and periphery arises. Every generality brings centralisation with it. Centralisation brings the parts within a specific space together and allows gathering. Centrality attracts certain objects to itself and brings them together and formats (Lefebvre, 1991: 397). *Differential space*, as a utopia, indicates; use instead of change, differences instead of homogeneity, quality instead of quantity, and lived space beyond the conceived (Wilson, 2013: 373). According to Lefebvrian's consideration, the end of the 20th century is a period dominated by lived space and points to the *differential space* as a new type of space (Wiedmann et al., 2012: 36–37).

The Spatial Triad of Lefebvre

In today's capitalist society, the production of space is similar to any other meta-production, and the value of the exchange is more important than the value of the usage. However, the use value of the space is important in Lefebvre's opinion. In this sense, the space is produced dialectically through three constituent or formative moments. The physical, mental, and social which means perceived, conceived, and lived space forms are the components of this triad. Lefebvre denies that space is only perceived and conceived and defends that space is produced by contradictions of physical and abstract dualism (Avar, 2009: 7–10). The space triad has a special rhythm with the perceived (we live without questioning and that shapes our space-oriented practices and habits), conceived (shapes the design of the space, its theoretical and abstract concepts, planning and arrangement of the space) and lived (contrary, radical, revolutionary and art that interrupts the routine, the living space that carries the uncertainty and the irrational) space (Kurtar, 2015: 354).

Lefebvre conceptualises the space triad as a spatial practice, representation of space and representational space which are a three-dimensional production (Avar, 2009: 7). *The spatial practice* is first related to space, which is a material reality. It covers roads and networks that connect buildings, structures, workspaces, and private and leisure areas and is observed empirically. *The representation of space* points to the abstract space and depends on information, signs, codes, and facade relationships (Lefebvre, 2014: 63). It reflects this ideology through effective knowledge of their spatial textures. This space includes abstraction, which is formed by considered, designed and objectified plans (Ghulyan, 2017: 23). The site was thought notional and has become objectionable through a specific spatial practice. Thus, it is the space of urban planners, technocrats, and artists (Aslan & Yavan, 2018: 305). *The representational space* which has historicity rather than design is inhabited, speaks, and has a sensory core (Lefebvre, 2014: 71). In this space people's actions, feelings, and experiences are real (Figure 1).

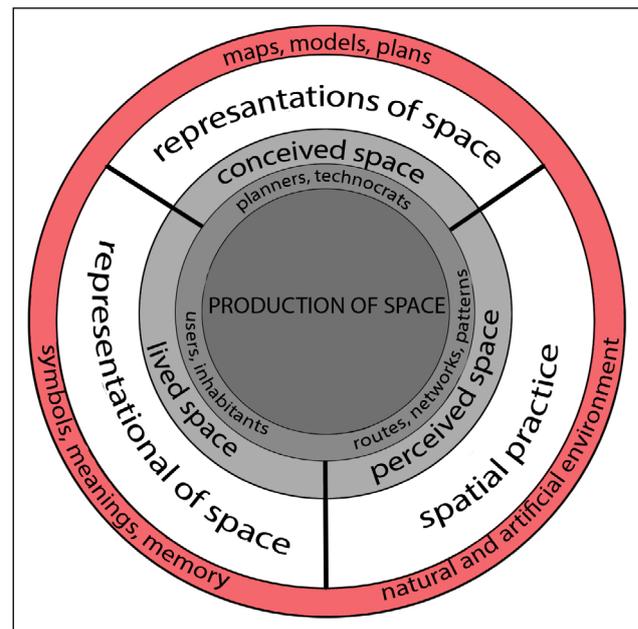


Figure 1. Conceptual model of Lefebvre's space triad (source: author adapted from Aslan & Yavan, 2018).

THE STORY OF THE ZONGULDAK – PERIODS OF THE MINING CITY FROM THE ABSOLUTE TO CONTRADICTORY SPACE

There are different periodisation studies to understand the history of Zonguldak hard coal basin. These studies divide the history of the basin mostly through the hard coal producer actors. Although this fragmentation facilitates periodisation, it creates artificial ruptures in certain issues due to its state-centeredness (Aytekin, 2006: 28). Despite the producer actors-oriented periodisation studies in the literature, dividing the mining city into periods based on Lefebvre's literature on the production of space will be useful to understand the relationship between meta and space production. As one of the first production zone of the city, Üzülmöz Valley, is the most important example describing the change of space with different dimensions (Figure 2). The valley and the city can be divided into three periods and sub-periods depending on the production relations (Table 1).

Small Town on Undiscovered Ores – Absolute Space of the City

The city centre of Zonguldak, where there is a wooden pier and timber is loaded and transported on boats, was a village in the Ereğli district until 1896 (Zaman, 2004: 16–17). Especially when the origin of the name is analysed, the natural conditions and geographical features of the period can be determined. The region is named “Zongra” or “zongralık” because of the reeds covering the entire bay, as Zone Ghuel Dagh coming from Göladağı with 770 m (Karaoğuz, 2014: 29–30) or “Zonklatan” because of

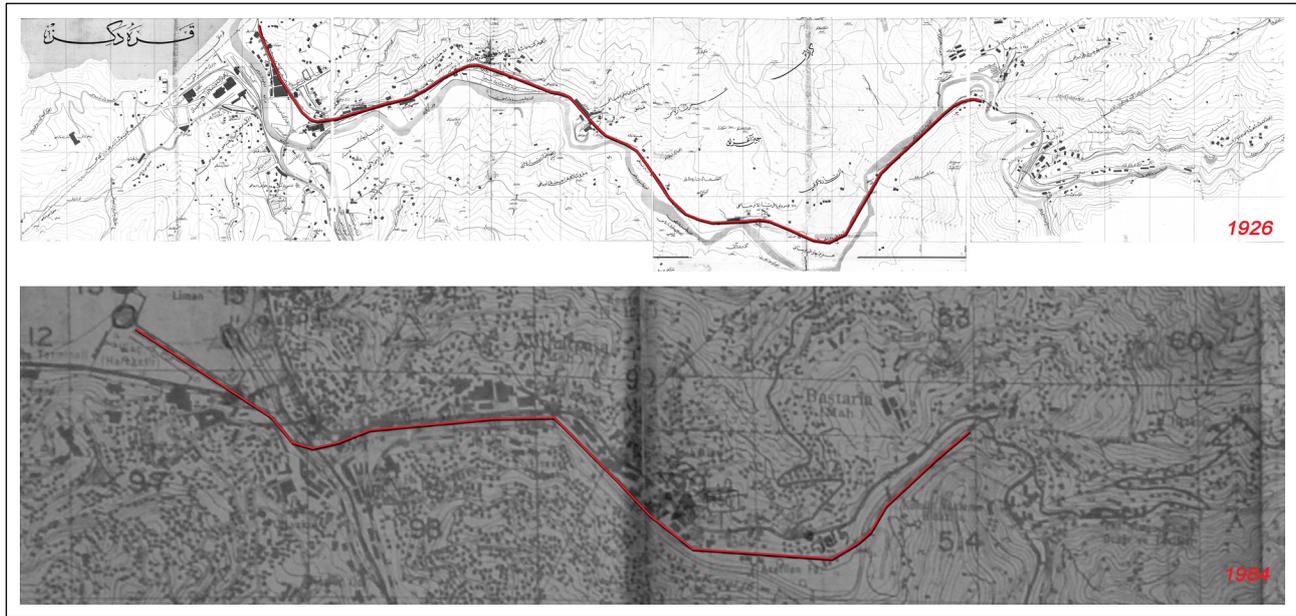


Figure 2. The map of Üzülmöz Valley 1926 (above) and 1984 (below) (adapted from; Museum of Maden Şehitleri, 1926; Zaman's archive, 1984).

Table 1. Spatial periodisation of Zonguldak

Space period	Phase	Period	Characteristics	The model of production	Actors of production
Absolute space of the valley	I. Phase (absolute)	1848	A small town on undiscovered ores; absolute place of the city	No production	-
	II. Phase (from absolute to abstract)	1848–1882 (free market economy)	The discovery of hard coal and the first years of production; unplanned settlement in absolute space	Semi-planned, labour-intensive	Foreign capital+ State (Ottoman Empire)
Abstract space of the valley	I. Phase (pre-abstract)	1882–1923 (Republic of Turkey)	Hybrid multinational structure of new investments and planned production; abstract space of early capitalism	Planned, labour-intensive	Foreign capital+ State (Ottoman Empire)
	II. Phase	1923–1940 (EKİ and Turkish joint-stock comp.)	Abstract space of national capital	Planned, labour-intensive	State (Republic of Turkey)
	III. Phase (abstract)	1940–1988 (privatisation)	Local values resisting global capital; abstract space of post-capitalism	Planned, semi-mechanised	State (Republic of Turkey)
Contradictory space of the valley	I. Phase	1988	New approaches toward a new future; contradictory space of globalisation	Planned, mechanised	State+ private companies

malaria disease (Sarıkoyuncu, 1992: 7–8). It is understood that tough natural conditions prevail in the region before settlement. Since there was no settlement and production plan in this period, the perceived space is more dominant than the conceived space.

The Discovery of Hard Coal and Pre-Production – First Formations From Absolute to Abstract Space

After the discovery of hard coal in 1829, operational problems arose with the start of production activities in 1848 (TTK, 2022). Although domestic and foreign

capital was not at the corporate level, some civil producers started their activities in the region with the permission of the Ottoman Empire. Due to the lack of infrastructure, mostly unplanned and temporary structural elements were formed. Especially in this period, miners gain professional experience by following the hard coal seam without having any underground production plan (Quarted, 2006: 82). In this period, the perceived space is still dominant over other spaces. Since there is no foresight and plan regarding construction and hard coal production, it is understood that the perceived space is dominant rather than the conceived

space. On the other hand, the indicators of daily life regarding the lived space are observed around the mines.

Hybrid Multinational Structure of New Investments and Planned Production – Abstract Space of Capitalism

The abstract space of the city can be analysed under three sub-periods. The first period is the duration that foreign companies dominate the basin. With the end of the state monopoly on hard coal sales in 1882, small and medium-sized companies began operating (Quarted, 2006: 89–90) and planning initiatives were developed. Also, the first planned settlements and broad railway plans can be observed (the first parcel traces, railway plans, etc.). In this sense small miner colonies built by companies for both mine owners, workers and engineers are clustered near the mine entrance (Bakioğlu, 2014: 105–107). On the other hand, many of the shift workers still continue their irregular settlements. The workers who came to the mines from the close villages in shifts with the regulation of forced labour¹ (Quarted, 2006: 54–58, 96–98) have pointed to the peasant-working class (Yıldırım, 2017: 38). Peasant-workers who came to the mines for short periods built their own huts made from mud and bushes to stay temporarily around the hard coal mines (Naim, 2014: 18–20).

The second period of abstract space is the first years of the young Turkish Republic. With the proclamation of the Republic, the infrastructure investments, which increased the production acceleration to meet the energy needs of the Turkish industry, increased rapidly. State-funded Turkish joint-stock companies² were planning production in the city, where investments have increased with statist policies (Zaman, 2021: 275–289). In this period, it is possible to say that there are many colonies designed with many different functions such as state-supported education,

accommodation, culture, and art. The campuses designed by Seyfi Arkan in 1935 (Figure 3), are modern colonies with different functional services such as workers' dormitories, engineer lodgings, primary schools, and canteens in Kozlu and Üzülmöz (İmamoğlu, 2009: 131–132).

The period between the establishment of the 1940 EKI (Ereğli Coal Enterprises) and the privatisation attempts of the late 80s is the 3rd period of abstract space. During this period, the efficiency of production was increased, especially for thermal power and iron steel plants (TTK, 2018). With the increase in production needs, internal migration and planning activities accelerated. Especially after the first development plans that started in 1953, (Zonguldak Municipality, 2015) Union of Metropolitan Municipalities was established in 1971 and the first regional metropolitan planning on a national scale was developed (Üzmez, 2014: 334). The abstract space of the valley with three sub-periods is a duration in which the dominance of the conceived space has increased and includes the contradictions of the perceived, lived, and conceived space.

Local Values Resisting Global Capital – Contradictory Space of Capitalism

In order to keep the rapidly increasing population and hard coal production of the valley under control, some kinds of plans have been produced at different scales. However, the zoning plans were prepared by the Union of Metropolitan Municipalities (Zonguldak-Kozlu-Kilimli-Çatalağzı), but they could not be implemented. After 1980, the holistic planning approach left its place to piecemeal planning in which each municipality made its own plan (Üzmez, 2014: 335–337). However, while the conceived space was expected to become dominant due to planning activities,

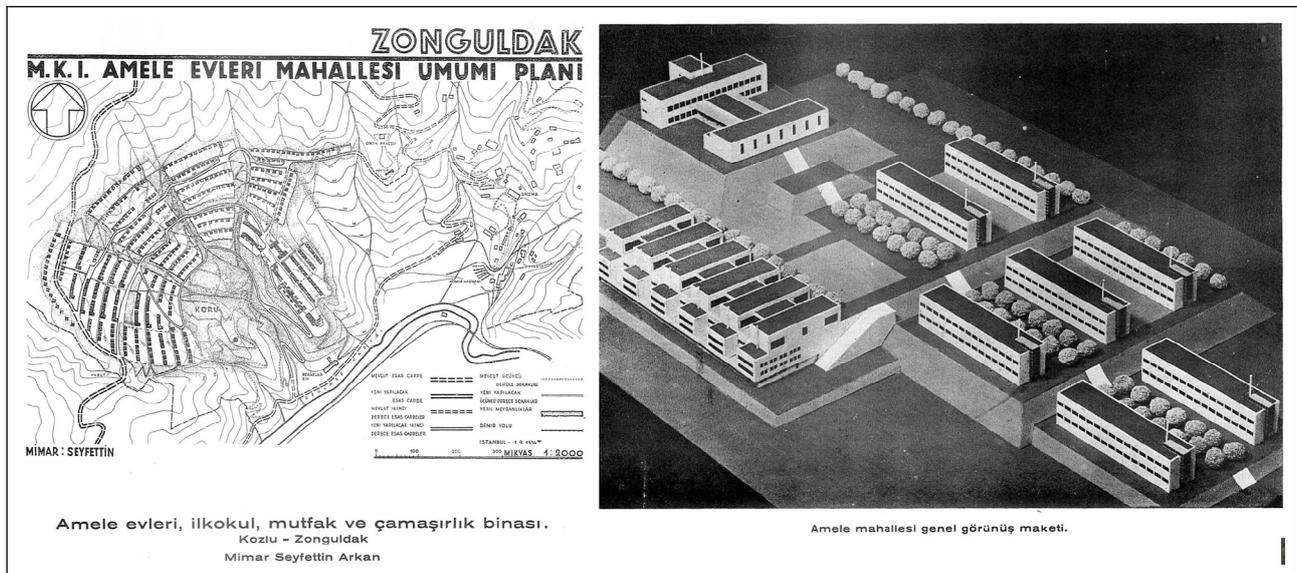


Figure 3. The site plan and model of the Üzülmöz Worker Houses district (1935) (Kömür Havzasında İş Bankası, 1937).

the plans could not be implemented. Tezkere-i Samiye³, which controls construction activities within certain limits, was also not effectively enforced, and the measures that can be taken regarding the artificial environment of the city have been insufficient (Zaman, 2021: 183–184; Zaman, 2004: 234–238). Urban texture spread towards the hard coal production zones with the effect of the topography and increasing population. Due to this spread, city pillars⁴ had to be created underground. In addition, subsidence⁵ effects are observed because of the suppression of underground hard coal production by space production on the ground (Figure 4). Therefore, this period, in which the conceived space is dominant, expresses full of conceptual and physical contradictions with both lived and perceived space characteristics.

FROM ABSTRACT TO CONTRADICTIONARY SPACE – THE SUB-INDICATORS OF THE SPACE TRIAD

In order to analyse the space production history of the mining city, the conceptual and physical indicators should be examined holistically with underground and ground. The three moments of the Üzülmöz Valley, which have all the characteristics of underground and ground hard coal production as a first production zone, can be explained by specific indicators and sub-indicators. Whereas the

production story of the space can be analysed with current maps, population, coal production data, underground production plans, and the cases in the memory of locals regarding worker and production policy. If it is considered that hard coal is an independent factor, the perceived space is shaped by the circumstance and transportation of the ore, the conceived space is shaped by production technology and administrators, and the lived space is shaped by collectivity and traumas (Figure 5).

As seen in Figure 6, the uncontrolled growth of the urban texture over the years and the resulting shift of production to the east of the Üzülmöz Valley revealed a tense relationship between coal and space production. As a result of the transformation of the space into a meta that can be bought and sold, the content of the space has been emptied and fragmented. In addition to contradictions such as quality/quantity, global/subdivided, and centre/periphery (Lefebvre, 1991: 352–357), new specific contradictions have emerged. These contradictions can be explained through the space triad of the valley.

Change of Perceived Space from Primitive Abstract to Contradictory Space – Spatial Practice

Due to the working conditions, the miners had to live close to their workplaces and urbanisation styles and relations emerged that centred on the hard coal mine

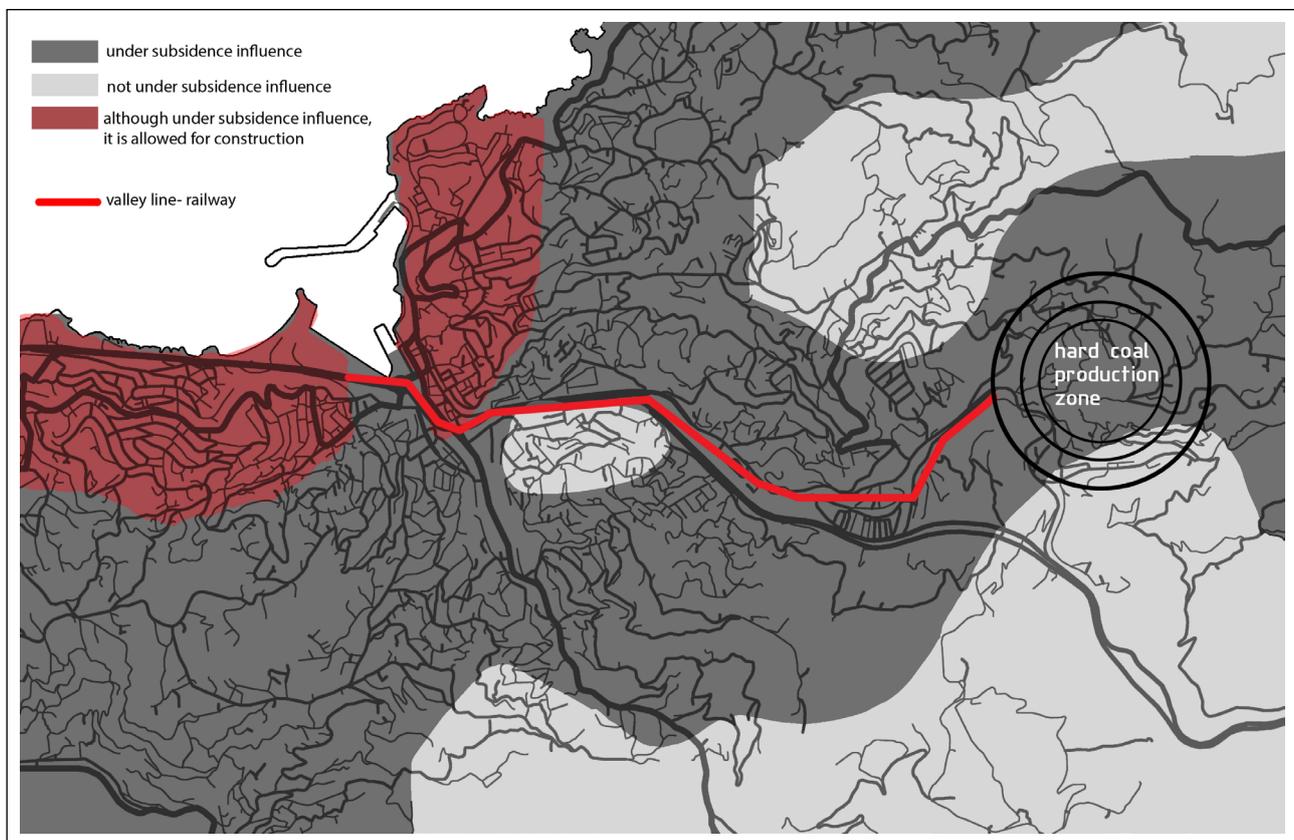


Figure 4. Subsidence map of Zonguldak (adapted from Aksoy & Dođru, 2015, p. 7).

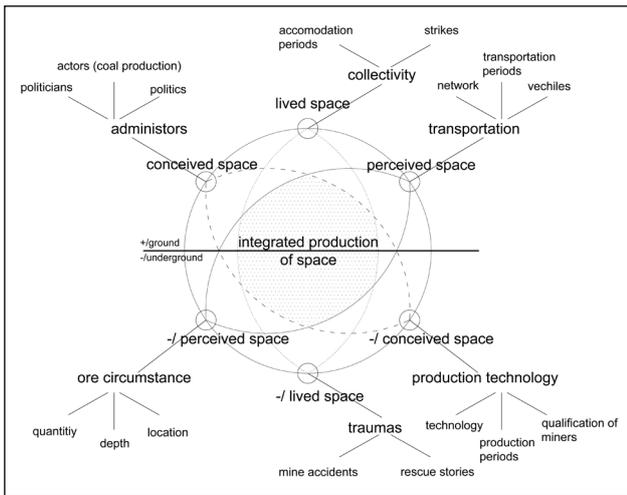


Figure 5. Sub-indicators of space triad in the mining city.

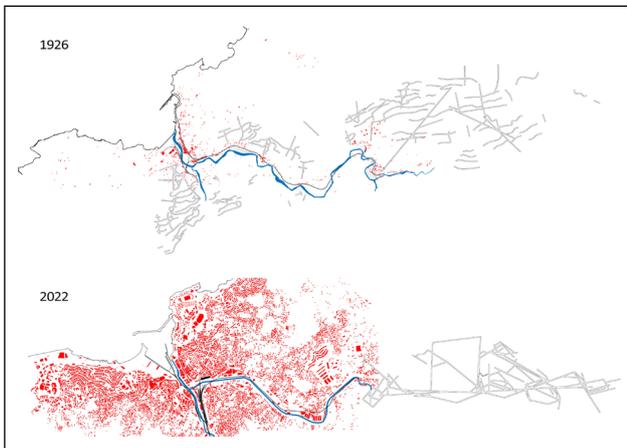


Figure 6. Urban texture and underground hard coal production plans at the beginning of the 20th and 21st century (adapted from BEÜ, 1903; BOA, 1908; Museum of Maden Şehitleri, 1926; TTK, 2021).

(Bakioğlu, 2014: 105). Colonies clustered around mines are settlements where different workers such as mine owners, engineers and workers lived together as Mine of Rombaki at the beginning of the 20th century (Figure 7) (Museum of Maden Şehitleri, 2022). However, the space shows the existence of settlements that prioritise quantity rather than quality in this century. The space, which is produced as a prototype with similar construction technology, design, and materials, has lost its local specificity (Kiper, 2004: 17). In the early 1900s, the hard coal was transported to the harbour by railway networks, while the spread of settlements along the valley led to the development of road networks today.

Change of Conceived Space From Primitive Abstract to Contradictory Space – Representation of Space

It can be said that the conceived space of the valley continues to exist not only on the surface but also underground.

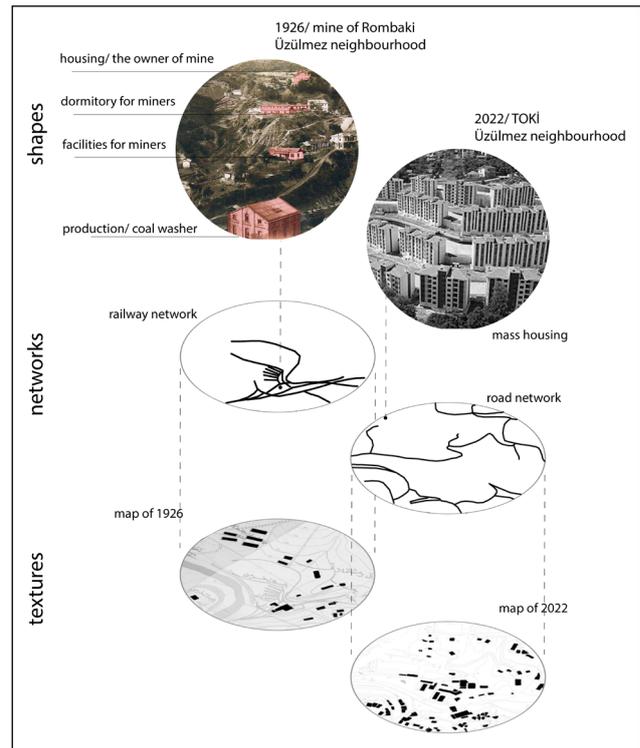


Figure 7. The change in perceived space over the years; a sample part of Üzülmöz Valley (adapted from Museum of Maden Şehitleri, 1926).

In this sense, projects developed based on production in pre-abstract space are small-scale. Considering the transportation constraints, it provides sufficient conditions at the minimum criteria. Since these projects aim for efficiency in production, working and living spaces are close to each other. As seen in Figure 8, while small colonies in the pre-abstract space formed their own original plans around the mines, today there is a hybrid and fragmented settlement. In addition, the hard coal production method underground has changed the production plans and the underground texture.⁶

Change of Lived Space From Primitive Abstract to Contradictory Space – Representational Space

The indicators of the living space as a third dimension covering the perceived and conceived space in the mining city are shaped by cases. Traumas in the underground and stories, memories and transformed using created by collectively refer to living space. It can be seen in Figure 9, collective resistance (strikes) and traumas have occurred in the city at different times. Because the change in the lived space has mostly occurred with the inclusion of working hours, workers’ rights and technology in the production line. The lack of workplace safety and regulations on workers’ rights, etc. have caused strikes at different times (Güler, 2019: 510–522). This collectivity and traumas brought space and case pairings. In this sense, Gazipaşa Street, which connects the mines and

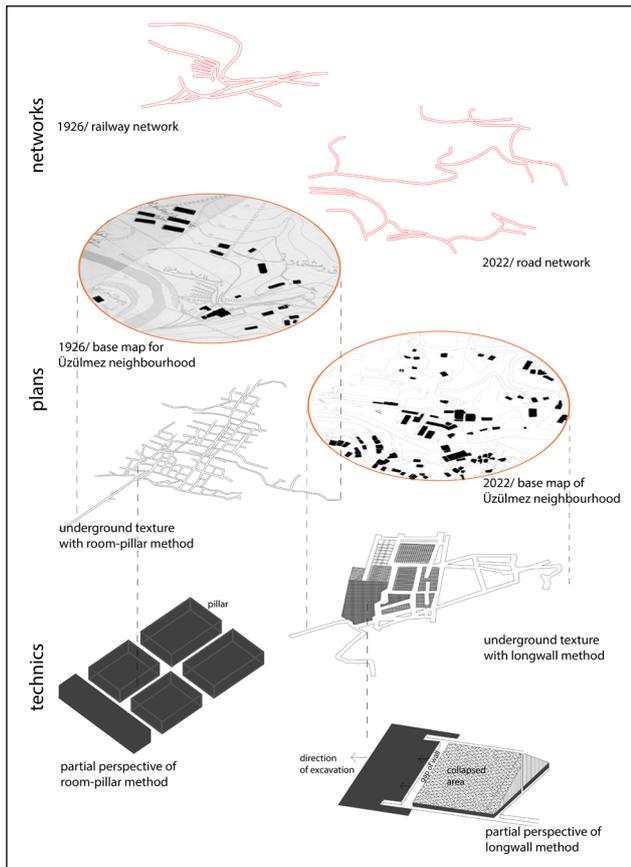


Figure 8. The change of the conceived space underground and above over the years; Üzülmöz zone (adapted from BEÜ, 1903; TTK, 2021; Museum of Maden Şehirleri, 1926).

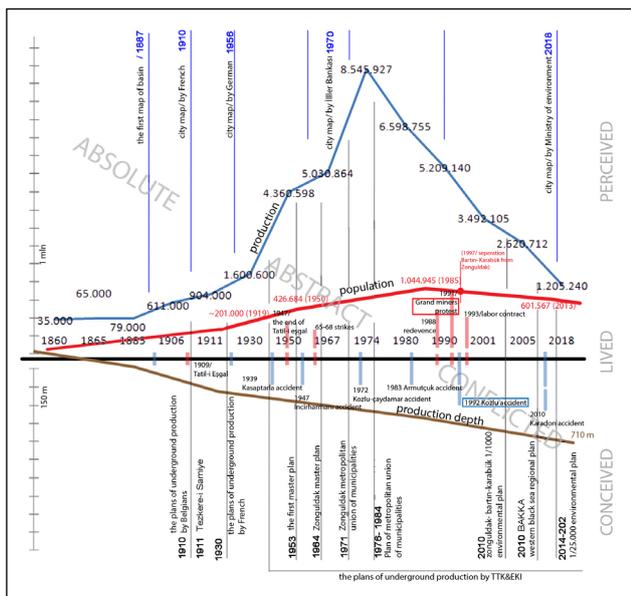


Figure 9. Indicators of the three dimensions of the valley from absolute to contradictory space (adapted from Quarted, 2006; TTK, 2018; Güler, 2009; Üzmez, 2014; TUİK 2022; Zaman, 2021).

the harbour, and subsequently the Ankara-Zonguldak Road, has become the symbol of the 91 protests (Kaya, 2008). On the other hand, mine entrances have evolved into a space where developed coordination due to rescue operations and the pain is shared with every new trauma (29 saniyede ölüm, 1992). However, hard coal production, which is fragmented into the private sector, prevents workers from developing a common discourse under different rights and economic conditions. Therefore, the lack of common discourse prevents the production of new space-case pairings.

THE RELATIONSHIP BETWEEN META AND SPACE PRODUCTION – THE DEEPENING CONTRADICTIONS OF THE MINING CITY

The periods of space production of the city and the space triad define the relationship between meta and space production that reveals today's contradictions. In the process from the *absolute space* to the present, the contradictions in the nature of the city have deepened day by day. As a mining city, Zonguldak added its own contradictions to the contradictions defined by Lefebvre. In addition to the contradictions of quality-quantity, global-subdivided, and centre-periphery existing in other cities, the city defines its own contradiction as plane-volume.

Contradictory Between Quality and Quantity

Especially since the 1940s, with the investments made in the city, spaces with different functions were produced beyond the facilities for production activities. The production policies shaped by the investments of the national capital required not only housing for the workers but also the construction of additional units supporting it. In this sense, different building typologies and contents have been developed such as canteens, schools, dispensaries, sports fields, etc. (Zaman, 2021: 424–447). While a total of 25,000 workers were employed underground and above in 1942, this number is approximately 8900 by 2021. Although salable hard coal has increased to 4.5 million tons over the years, it is around 870 thousand today (TTK, 2018, 2020). The amount of production and the number of employees have been affected by the decisions taken for the space as well as the mining policies. Accordingly, after the 1980s, the increase in corporatisation activities and the removal of some services from the responsibility of the TTK changed the content of the space, and there was a decrease in the number of workers, especially in the ground services. Special structures such as housing, workshops, canteens, and cinemas, which were designed to meet the daily needs of employees and reflect the daily life of hard coal production, were destroyed and transformed into units with high-profit rates. An example of the contradiction between quality and quantity is the mass housing projects built by the destruction of quality miner colonies and prioritising

quantity. As seen in Figure 10, the Üzülmez Worker's House neighbourhood was designed by Architect Seyfi Arkan as a campus serving different functions such as residences, schools, canteens, and dormitories in different typologies (İmamoğlu, 2009: 131–132). Today, some part of the area has been transformed into a mass housing project where repetition and quantity are prioritised.

Contradictory Between Global and Sub-Divided

As it can be understood from the quality-quantity contradiction, the production of the space itself has started from the things produced in the space. As observed in the valley, the city, which was divided into parts from the past to the present, has evolved into a feature where the space is bought and sold over parcels. In the early 1900s, although the productive actors kept their colonial structures under their protection and prevented the acquisition of property, today's space is divided into parcels and sold by different stakeholders. Especially the port area, where the valley ends, has high parcel values due to reasons such as ease of transportation, coastal factor, and commercial vitality. Although the different hard coal mines along the valley at the beginning of the 20th century focused on meta production for a common purpose, today, with the advantage of the production shifting to the east, the valley has been divided into neighbourhoods and parcels with different functions and profits.

Contradictory Between Central and Periphery

As a natural consequence of the contradiction between the global and subdivided, the contradiction between

the central and the periphery arises. While the hard coal production zones are mostly clustered on the eastern side of the valley, the harbour, where trade is ongoing, has increased its density and centrality over the years. It can be determined that both the functional diversity and the unit values of the land increase from the production zone to the harbour, especially on the railway track in the valley (GİB, 2022). Therefore, the city centre, which is concentrated in terms of both content and quantity, excludes the production zone and consolidates its periphery feature.

Contradictory Between Plane and Volume

When the production story of the space is analysed, it can be said that the tense but dependent relationship between the underground and the ground is the main reason for other contradictions. The integrated geological structure above and below includes physical and conceptual contradictions that develop due to hard coal production. The contradiction between the production of meta and space has caused the specific contradiction for mining cities as a plane and volume.

The conceptual tension of the surface expresses the notional contrasts of both sides of the surface such as up-down, black-white, ceiling-floor, and individuality-collectivity. Although these contrasts seem to have started between the underground and the ground, they continued to generate the same dualities on both sides of the surface. It can be said that the contradictions get stronger and cause conceptual tension on the ground as getting closer to the surface. On the other hand, the physical tension of the surface arises depending on the direction, speed, and quantity of full-emptiness movement. The most tangible indicator of this contradiction is the subsidence effect, which indicates the danger for mining cities. This threat is important to understand the tension of the relationship between space and meta production.

The direction of movement – In the process from the absolute to the *contradictory space*, both the fullness and the emptiness move away from the surface. While the ongoing space production on the surface increases the floor heights with its structure in which the quantity is prominent, hard coal is produced by going deep because it is consumed by digging near the surface over the years. The fullness and the emptiness move in the opposite direction.

Quantity of movement – In the historical process, it can be mentioned that there is a continuous increase in the production of space on earth. Although the speed of space production changes on the surface, there is a constant increase in variables such as population, production policy, and ideology. On the other hand, the excavation technique of the mine affects the amount of emptiness created underground. In the room pillar method, the roof security is provided with the pillars, while the emptiness is produced continuously. In the longwall method, where the loss of

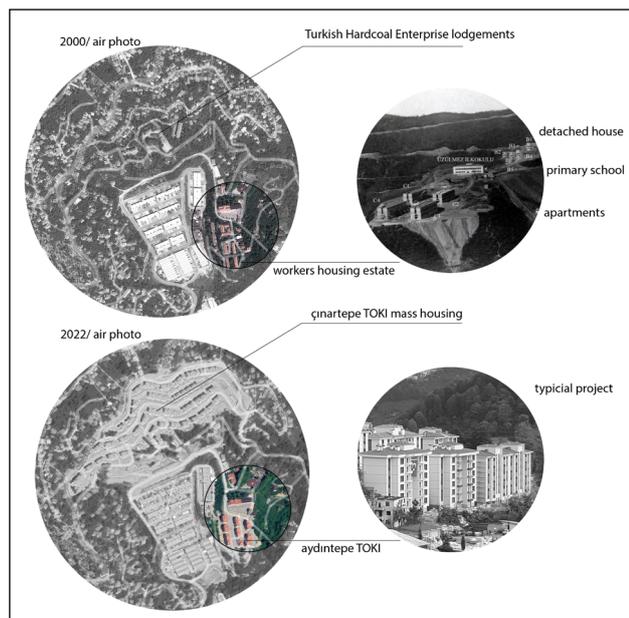


Figure 10. Change of mining colonies in Üzülmez neighbourhood between 2000 and 2021 (Google Earth, 2022; Kömür Havzasında İş Bankası, 1935).

ore is minimised, the excavated area is collapsed, and the emptiness is kept under control (Figure 11). For this reason, there is no continuously produced space on the surface.

Speed of movement – Despite the continuous increase in the occupancy on the earth, the emptiness created under the ground is kept under control to prevent the danger of subsidence. This causes variability in the speeds of fullness and emptiness production. Moreover, the most important indicator of the speed difference is “city pillars” although the reserve continues underground, it includes physical and conceptual contrasts as the boundary point where the excavation is stopped so that the excavation activities do not cause deformation on the earth.

When the sub-indicators of the contradictions between plane and volume are evaluated, it can be said that the contradictions regarding the production of space have deepened due to mining activities. As can be seen in Figure 12, while a continuous emptiness is produced with the room and pillar system for hard coal production in the first years of mining, the surface is not filled at the same momentum. This situation expresses a balanced relationship between space and meta production. In addition, the settlement zones are not dense and close enough to suppress the mines. With the longwall system, although the underground emptiness is variable, the continuous increase of fullness percentage on the ground has revealed a tense relationship. As a reflection of this tense relationship, what kind of deformation the subsidence will cause on the surface is related to the panel⁷ width, length, coal seam thickness and production depth determined by the production method (Arca & Kutoğlu, 2017: 33).

The specific contradictions of the mining city identified based on the Lefebvre literature reveal the tense relationship between meta and space production. The production of hard coal affects the production of the space that serves producers. The tense relationship between meta and space production which gives the urban surface a differential feature creates both physical and conceptual contradictions.

CONCLUSION

In the first periods of coal production, mines gathered around their spatial needs and space production developed depending on meta production. However, nowadays production is being withdrawn to the east of the Üzülmöz Valley day-by-day to avoid the subsidence effect on the earth. While the production of hard coal shaped the production of space at the beginning of the 20th century, today it is under the pressure of the production of space. Moreover, specific urban contradictions create their own sub-contradictions at different scales.

The people-oriented contradiction of the city is about human health. Although hard coal provides economic benefits, it causes unhealthy conditions due to the production, transportation and burning activities. The sub-contradiction on the scale of production is that coal is a meta that is produced by consumption. Hard coal ore is removed from its location and transformed into energy input, and each new hard coal production ends its existence underground. At the spatial scale, its contradiction is the full-empty tension. Despite the changing gaps based on coal production underground, there is uncontrolled space

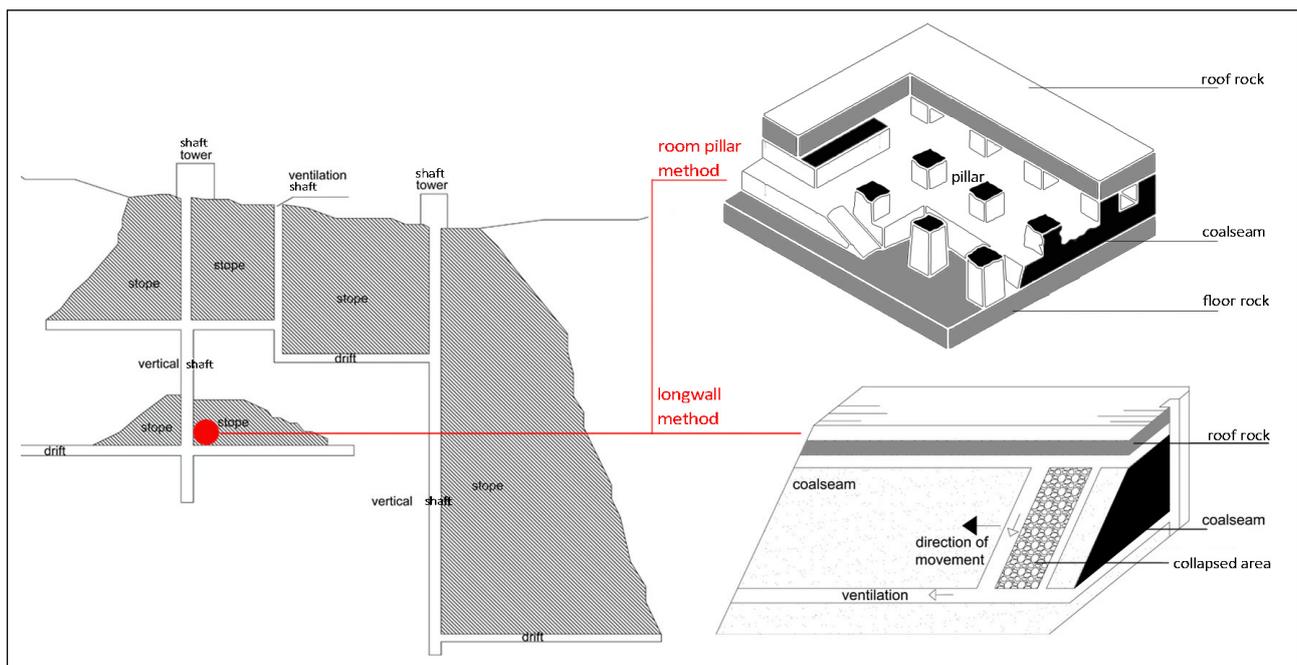


Figure 11. Schematic section of hard coal mines and modelling of longwall and room-pillar method.

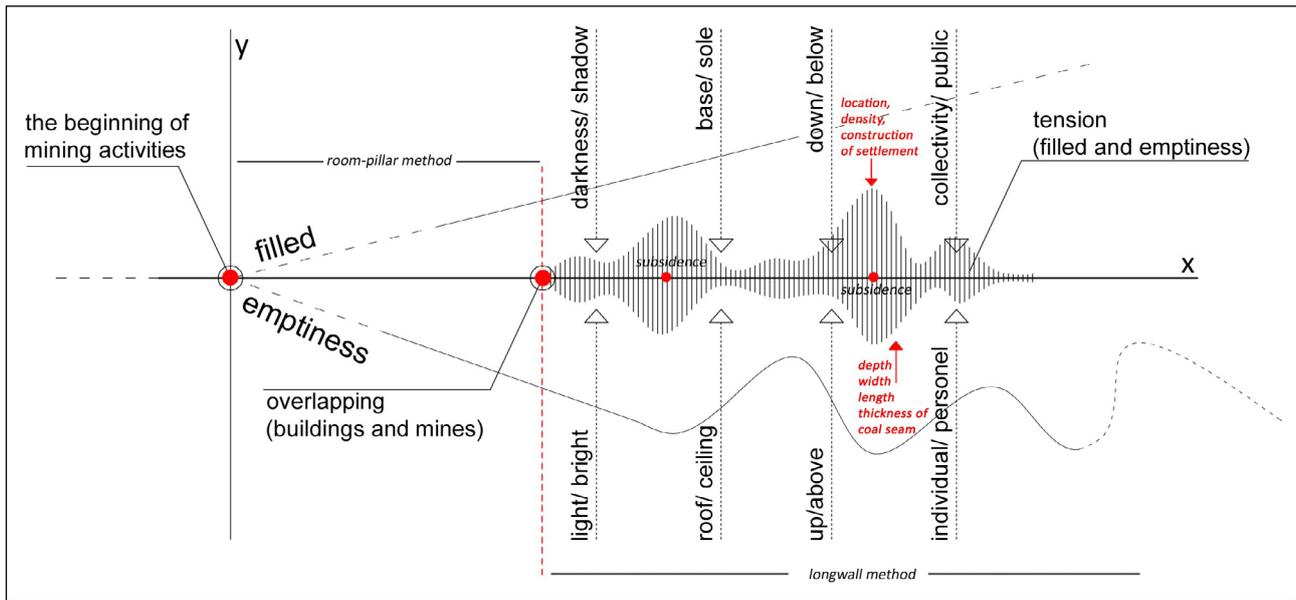


Figure 12. Schematic representation of the ongoing movement above and underground in line with the hard coal production method.

production because of its transformation into a meta that can be bought and sold. Therefore, this situation causes both physical and conceptual tension on the surface. On the other hand, the city is a set of contradictions regarding the tense relationship between the production of meta and space as an embracive scale.

The spatial production of hard coal, which has developed from its production nature, has created subjective contradictions as well as revealed similar contradictions as today's cities. The tense relationship that develops between meta and space production emerges with the transfer of what belongs to *absolute space* to the present. Considering that hard coal has a history of 300 million years, Zonguldak, which brings together millions of years ago and today, shows a differential feature with the similarities and contrasts of space and meta production.

¹"In 1882, when 40% of the sale of coal was allowed to be sold to the free market, many foreign companies have come to the region and more labour force was needed to increase the production volume. In this sense with the Dilaverpaşa Regulation, that is regulating the working conditions and rights of workers, the locals who are reluctant to work in mines have been forced to work in the mines for tax relief. According to the Dilaverpaşa Regulation, workers work in 12-day shifts and at the end of 12 days, they return to their villages to continue their agricultural activities (Quarted, 2006:54–58, 96–98).

²İş Bank- Türk Kömür Madenleri TAŞ, Kozlu Kömür İşleri TAŞ, Kireçlik Kömür Mad. TAŞ, Maden Kömürler İş. TAŞ, Kilimli Maden İş. TAŞ., Amasra Kömür İstimar Mın. TAŞ, etc. ³It is the prime minister's letter numbered 1910 and 289, which prohibits the construction of buildings and assign the lands to the state due to the suppression of production by the

construction activities around the mines. It is prohibited to build and open land without state permission within the concession areas determined by the state (Zaman, 2021: p. 183).

⁴Pillar: A mineral mass that is left in or between the places where production is ongoing in the underground operation. It has no definite shape and will be taken or not taken later. The task of the pillar is to hold the roof and maintain the integrity of the formation between the layers (ETİ, 2021).

⁵Subsidence, displacement, slope, curvature changes and unit strain effects caused by underground mining activities on the land (Arat & Kuşçu, 1992, p. 113).

⁶"In room and pillar mining, seams of coal are mined partially, leaving large pillars of coal intact to support the overlying layers of rock" (Gianfrancesco, 2017: 647). There is a 40% loss of ore in this method (ETİ, 2022). "Longwall is a mining method in which very long rectangular blocks of coal are defined during the development stage of the mine and then extracted in a single continuous operation by an automated cutting head moving parallel to the coal face" (Cleveland & Morris, 2015: 355).

⁷Extraction panel: The part between the floors in a coal seam which is taken into operation and excavation (ETİ, 2022).

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