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Shaping a model of transformation in a huge centre of zinc and lead smelting: case study of Szopienice district in the city of Katowice (Poland)

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Abstract. The problem of dynamic transformations within complex settlement systems poses an important challenge to planning. This is particularly true of post-industrial and post-mining regions, whose economic past adds an additional dimension affecting development and spatial policy. However, the article highlights the case of a settlement (Szopienice – a district of the city of Katowice in southern Poland) with a heterogeneous genesis in relation to the (post-)mining region in which it is located. Taking into account its economic development founded on zinc and lead metallurgy, the difficulties of development projection are pointed out. These difficulties are emphasised by a focus on the importance of paying attention to this type of locality from several research perspectives. In addition to the aforementioned heterogeneity, the role of "in-between" town locations and spatial peripheralisation is highlighted.

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1. Introduction

Although Szopienice – a district of the city of Katowice – is spatially less peripheralised in the 21st century than it was in the 20th century, and spatial-functional unification is one of the most important regional challenges in spatial planning, both attributes have resulted in this settlement being increasingly marginalised. The marginalisation of Szopienice may also be exacerbated by the fact that it is a "non-mining" district within a (post-)mining urban region. It is precisely coal mining that is a key element in building a regional development policy that refers to decarbonisation and equitable transformation (Gawlik, 2018; Harrahill & Douglas, 2019; Normann & Telmann, 2021; Sokołowski et al., 2022; Vatalis et al., 2022).

Regardless of the challenges of the present day, the example presented in this article shows just how important it is to view the development of complex settlement systems from the perspective of several conceptual approaches. In this case, such an approach is justified for two reasons. Firstly, the article discusses one of the "most difficult" districts of Central Europe's largest urban area (the Katowice conurbation) (Fig. 1). Secondly, in the locality in question, what is apparent is the overlapping of specific features of space captured by these concepts and the amplification of their rather pejorative aspects.

Hence, with regard to the above, the key research question must be posed: Does the status of "one of the most difficult" districts in the metropolitan region (which is the result of a spatially complex and multidimensional history) have the effect of, among other things, creating individual conditions for structural change in the near future?

In attempting to address this question, the paper hypothesises that multidimensional development, based on the particular locational and functional conditions of the past, requires local policies that take these facts into account in order to be more "targeted", which should guarantee an appropriate end result.

To address this hypothesis, the aim of this article is to identify and explain the basis for the development of the Szopienice settlement in Katowice, which, from the perspective of the progressive integration of the metropolitan area, constitutes one of the key challenges for implementing urban policy and strategy.

Fig. 1. Location of the research area
Source: authors' work

2. Framework assessment

2.1. Three conceptual perspectives: economic heterogeneity, peripheralisation, localisation "in between"

In (post-)coal mining regions, areas directly related to this economic sector are a key research issue (Ache, 2000; Harfst & Wirth, 2011; Wirth et al., 2012; Krzysztofik et al., 2016). Over the past two centuries, many mining regions have formed a specific polycentric settlement network, which morphologically started to form industrial urban conurbations, such as the Ruhr in Germany or the Katowice conurbation in Poland (Blotevogel, 1998; Wehling, 1998; Knapp et al., 2006; Szymańska, 2013; Krzysztofik, 2021).

Contemporary discourses on post-coal regions focus on issues such as: climate change (Unruh, 2000; Pearson & Foxon, 2012), just transition (Frolova et al., 2019; Kazak et al., 2023; Drobniak, 2023), post-mining management brownfields (Pediaditi et al., 2010; Rahmonov et al. 2020; Pytel et al. 2021; Turečková et al., 2022), economic competitiveness (Harfst & Wirth, 2011; Klusáček et al., 2018; Kantor-Pietraga et al., 2023). Publications devoted to these issues are an important element in understanding the socio-economic and spatial-infrastructural changes in (post-)mining regions.

However, areas economically unrelated to mining are also located within these regions. These form functionally heterogeneous zones.

The problem of economic heterogeneity has been a subject of interesting research in recent years (Burger et al., 2011; Phelps, Atienza & Arias, 2015; Yin et al., 2022). A special case in geographical space is economic heterogeneity that is environmentally, historically and socially conditioned. As stated in research on urban and rural areas in Poland, social heterogeneity was determined by both economic and infrastructural factors (Krzysztofik et al., 2017; Dragan & Zdyrko, 2023). The heterogeneity manifests itself in different spatial and functional forms. On the one hand, it might be the small historic town of Hattingen in the Ruhr, which escaped the processes of rapid industrialisation in the 19th and 20th centuries. On the other hand, there are service sector gateway cities on the former national borders dividing the economic region (Katowice conurbation). This group also includes settlements located in mining regions but whose industrialisation was based on industries other than coal or iron and steel.

Under conditions of progressive urbanisation, the heterogeneity of the development of such localities is put to the test in some way. On the one hand, they may gain competitive advantages (e.g., former gateway cities – Katowice or Sosnowiec - Gwosdz, 2004; Bird, 1977). What most often seem to be key here are local political conditions (a given or existing political border) creating gateway cities or environmental conditions (a large lake or river – the port functions of Duisburg or Gliwice), specific minerals, physiographic features (edge, valley, hill[s]). On the other hand, they may lead to marginalisation with respect to neighbouring dynamically developing mining and metallurgical cities (Hattingen) (Keil & Wetterau, 2013). Industrial centres not associated with dominant industries have different development paths. A special case with regard to geographical location and the specific nature of production is that of relatively spatially isolated settlements whose development in the 19th and 20th centuries was based on industries with a heavy impact on human health and the natural environment. In the Katowice conurbation, for example, such a sector was lead and zinc smelting.

Under certain conditions, functional heterogeneity may turn into peripheralisation or partial spatial isolation. The essence of development here is the attribute of otherness, whether social or, as in the case under consideration here, primarily environmental and partly political. Peripheralisation in a highly urbanised zone may in turn contribute to the creation of isolated, sparsely populated zones, although not necessarily poorly developed ones. This phenomenon refers to the inner peripheralisation model (see Humer, 2017). Functionally and spatially, however, they are mainly similar to Sieverts' in-between city (Zwischenstadt) model (Sieverts, 1999; Vicenzotti & Qviström, 2018). Settlements located "in between" are subjected to strong pressure from surrounding larger urban centres. The centrifugal forces acting on larger cities significantly affect the patterns of functional linkages between urban cores and the areas located in between. The in-between zone is subordinate and dependent on the dominant centres (Kunzmann, 2010). The functionally heterogeneous (in relation to the region) locality and the surrounding (in this case) mining settlements are subjected to the same pressure from the leading urban centres as is the case in the rural regions forming the traditional background to explanations of this concept. An interesting overview of models and concepts referring to the attributes: large urban region, polycentricity, peripheralisation was recently presented by Humer (2017). He presented seven approaches to the phenomenon: urban dispersion,

model in between spaces, hinterland (dependent areas), aspatial peripherality, rural areas in between metropolises, disconnected peripheries, and inner peripheries.

2.2. Towards a heterogeneous urban settlement of in-between spaces

Since the interactions defined in the in-between spaces model are based on common physical forces and regularities (centripetal and centrifugal forces), they operate to the same degree in an agricultural region as in a mining region. In the latter, the in-between metropolises model is also more often indicated (Sieverts, 1999). A small city in an agricultural in-between zone is influenced by neighbouring large centres. In this multi-subject relation, what are evident are relationships and interactions based on cooperation, dependence and competition, which are characteristic of socio-economic space. The most characteristic spatial consequence of the cities' interaction with the in-between zone is suburbanisation and partial counter-urbanisation. Similar phenomena occur in conurbation-like mining regions. Here, agricultural activity is supplanted by industrial and/or mining activity. Larger cities interact with each other, but also with the economic and settlement areas located in between. The spatial effect of these interactions, however, is urbanisation based on the local functions of specialised small settlements (disconnected periphery) and amalgamation (Eskelinen & Fritsch, 2009; Humer, 2017; Szmytkie & Krzysztofik 2019; Swianiewicz & Szmigiel-Rawska, 2021). The existence of smaller settlements effectively resisting spatial or administrative integration for a long time is due to their "repelling" capacities. These manifest themselves in specific peripheralisation or isolation and result from three genetic conditions:

- strongly marked specialised functions,
- the existence of barriers to integration (physiognomic, environmental, political, administrative, cultural),
- the development priorities of large neighbouring cities oriented towards other areas.

The long-term spatial and functional peripheralisation of settlements located in the environs of larger cities is nowadays revealed in the in-between city model. A relatively small area of residential development, a large share of functionally derelict and green areas, and a lack of cohesion of built-up spaces with the surrounding districts and cities create a distinctive spatial-functional arrangement. There are numerous cities and settlements of this type, both within cities and rural areas (Krzysztofik et al., 2017). However, they are generally characterised either by their limited territorial size or by conditions determined by a single genetic element. The greatest challenge in terms of cognition and application is always in areas with highly complex spatial and functional genesis, and with a relatively large area and population (Runge et al., 2020). One such model case is that of Szopienice, located in eastern Katowice district on the border with two other cities in the conurbation – Sosnowiec and Mysłowice.

3. Methods

Studies on changes in the spatial functions of Szopienice and the development policy of this part of Katowice address several research issues: heterogeneity, peripheralisation and in-between location (Fig. 2). Several research methods were applied as the starting point for theoretical explanations and for linking them to studies of an empirical nature. This spatial research was based on an analysis of chronologically compiled topographic maps covering several historical stages (1749, 1900, the 1930s, the 1950s, the 1990s) and the present day, and these presented changes in land use and functions of the study area (Wrede, 1749; *Topographische Karte* 1900; *Detailed topographic map* 1933; *Topographic map* 1960; *Topographic map* 1994–1995: Geoportal, 2023). To verify the contemporary land use, a field inventory and a review of REGON databases were carried out. This procedure not only allowed the change in land use to be assessed, but also the historic post-industrial areas that play a significant role in shaping the spatial policy of post-industrial areas to be identified.

For the cartometric measurement of individual areas, archival cartographic materials were acquired and georeferenced. (The geographic coordinate system adopted was EPSG 2180.) The next step was to digitise the content of these materials according to the following distinct forms: industrial buildings, other buildings, railway lines, watercourses, water bodies, forests and dense woodland, post-industrial heaps, post-industrial pits. This made it possible to compile comparable maps for all the time intervals analysed. A separate category was historic post-industrial areas, among which two types of brownfields were distinguished – contemporary and former (historical). Contemporary (existing in 2023) brownfields are areas not yet redeveloped, whilst the

historical brownfield sites include areas where some new industrial or non-industrial functions have been introduced on the different stages of development. These areas show the role of brownfields in the part of the city of Katowice analysed here. The information on the spatial functions of Szopienice was supplemented by establishing the changes taking place in their proportion of the study area from the 18th century to the present day.

A detailed analysis of the *Master Plan of Katowice* (*Studium Uwarunkowań i …*, 2012) and the *Master Plan of GZM Metropolis* (Metropoliagzm, 2023) also constituted an important element of the research. This was complemented by information on the *City Development Strategy* (*City Development Strategy …*, 2015) and other documents relating to the development of the district being studied (Portal Komunalny, 2023).

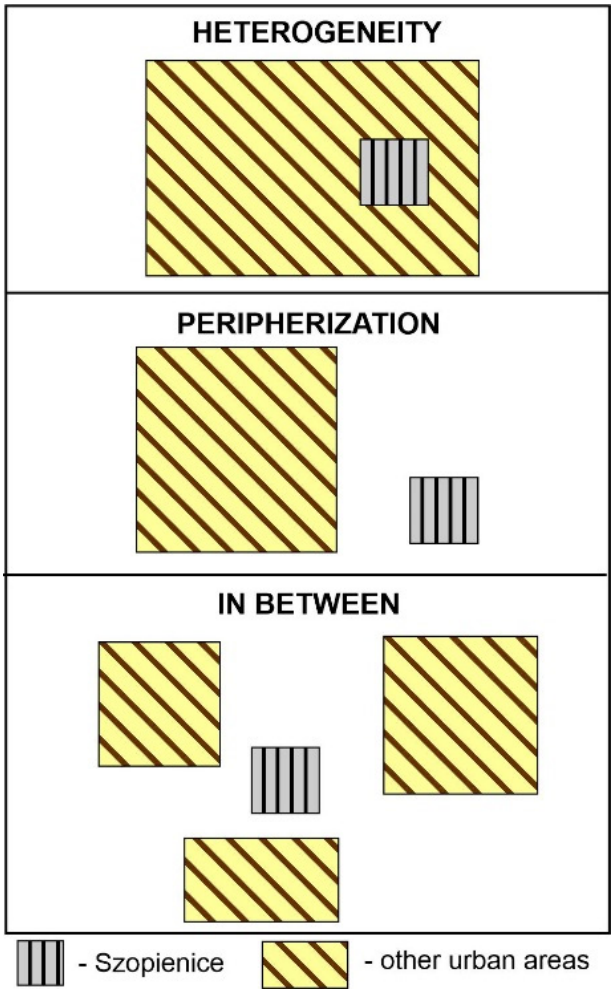

Fig. 2. Theoretical models (diagrams) that refer to the development of Szopienice from a geographical and dynamic perspective
Source: authors' work

4. Origin and transformation of the study area and its spatial changes in terms of different explanatory models

Szopienice and Rozdzień (which was later integrated with Szopienice) were established in the second half of the 14th century as two agricultural villages on the Rawa River near its confluence with the Brynica River. During this period, the Brynica also constituted a state border (first Polish–Silesian, then Polish–Prussian and Russian–Prussian) in their vicinity. The villages were small but, from at least the 16th century onwards, feudal iron smelting developed on their boundary, facilitated by the use of the river flow. From the 18th century, coal mining began to develop on a larger scale in the Szopienice area. However, compared to neighbouring villages, it was of minor importance in Szopienice and Roździeń. In the feudal period, only one feature influencing the later heterogeneity of the settlements in question is revealed – metallurgical traditions (but not yet related to zinc and lead). A greater role was played by the political border, as one of the reasons for Szopienice's spatial isolation, thus shaping the in-between city model in subsequent centuries. The spatial and functional layout of Szopienice and Roździeń at that time is presented in Figure 3.

The 19th century and first half of the 20th century saw the development of Szopienice's heterogeneity and the formation of the in-between city model (Fig. 5A). During this period, Szopienice became one of Europe's largest centres of zinc and lead production. In 1900, three smelters of these metals were in operation here. Rapid industrialisation resulted in the spatial development of both villages, which eventually merged into a single urban organism. The population increased from ~1,000 in 1840 to ~15,000 in 1873 (Długoborski & Popiołek, 1957; Zgorzelska et al., 1991). The great growth in the metallurgy sector marginalised local agriculture, while some other industries (food or chemicals) developed as complementary sectors. Szopienice then became one of two great enclaves of zinc–lead (metallurgy) in a conurbation based on the mining and metallurgical (iron) industries (Table 1). The second enclave, but with a greater role for zinc and lead mining and a smaller role for metallurgy, was the region: Szarlej – Brzeziny Śląskie – Brzozowice-Kamień (today three quarters of the city of Piekary Śląskie). At the same time, the settlement was surrounded by three rapidly developing gateway cities that emerged as border railway centres, namely Katowice, Sosnowiec and Mysłowice (Fig. 4) and (Fig. 5B). Szopienice is functionally different from

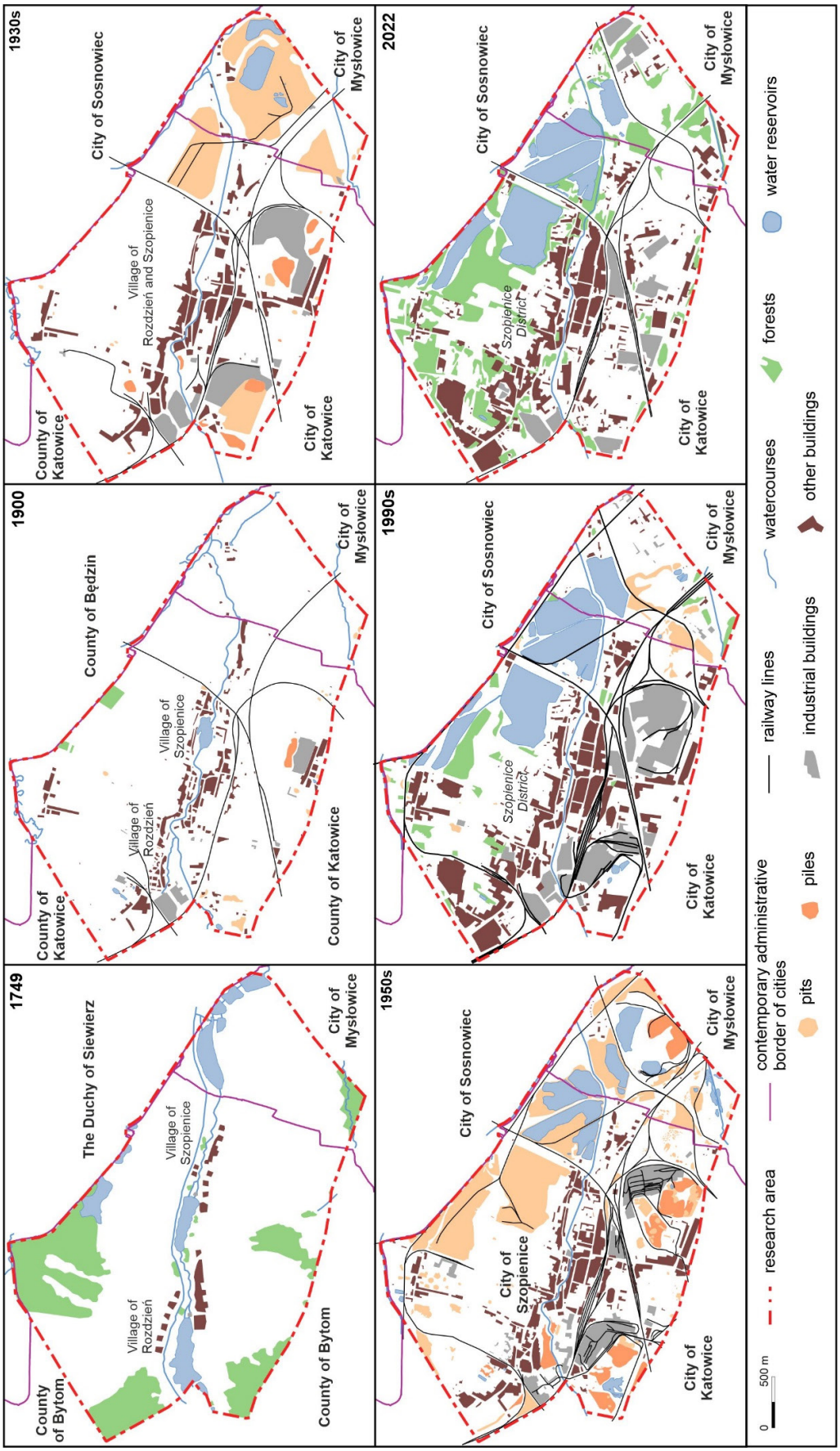

Fig. 3. The functional and spatial development of Szopienice from the 18th century to the present day
Source: authors' work

Table 1. Economic base of towns and settlements in Katowice region in the latter 19th and early 20th centuries

Towns and settlements around Szopienice (1–5 km)	
Town/settlement	**Most important types of economic activity**
Katowice	gateway functions, coal mining
Zawodzie	coal mining, steelworks
Bogucice	coal mining
Dąbrówka Wielka	coal mining
Milowice	coal mining
Sosnowiec – settlement at railway station	gateway functions
Ostra Górka	coal mining
Dębowa Góra	coal mining
Radocha	coal mining, chemical industry
Modrzejów	coal mining, gateway functions
Niwka	coal mining, steelworks
Mysłowice – Old Town	gateway functions
Brzęczkowice	coal mining
Piasek	coal mining
Nikiszowiec	coal mining
Giszowiec	coal mining
Janów	coal mining
The most important towns and settlements in Katowice region	
Town/settlement	**Most important types of economic activity**
Katowice	gateway functions, coal mining
Sosnowiec	gateway functions
Mysłowice	gateway functions
Królewska Huta (Chorzów)	coal mining, steelworks
Hajduki	steel works
Świętochłowice	coal mining, steelworks
Ruda	coal mining
Nowy Bytom	coal mining, steelworks
Wirek	coal mining
Bytom	coal mining, various manufacturing
Zabrze	coal mining, steelworks
Gliwice	steelworks, various manufacturing, coal mining
Radzionków	coal mining
Tarnowskie Góry	zinc/lead mining, various manufacturing
Knurów	coal mining
Siemianowice Śląskie	coal mining
Piekary Śląskie	coal mining
Szarlej	zinc/lead mining
Brzeziny Śląskie	zinc/lead mining and metallurgy
Brzozowice-Kamień	coal mining
Wojkowice	coal mining
Grodziec	coal mining
Będzin	various
Czeladź	coal mining
Dąbrowa Górnicza	coal mining
Zagórze	coal mining, steelworks

Klimontów	coal mining
Porąbka	coal mining
Kazimierz Górniczy	coal mining
Jaworzno	coal mining
Szczakowa	gateway functions
Kostuchna	coal mining
Murcki	coal mining
Brzezinka	coal mining
Wesoła	coal mining

Source: own elaboration based on: Gwosdz, 2004; Krzysztofik et al., 2016

the service and commercial gateway cities but, as mentioned, it is also different to the numerous mining settlements in the area (Gwosdz, 2004). The village is spared the problems of subsidence caused by coal mining, but there are problems of dramatic ground and air contamination with lead, zinc and cadmium (*Studium Uwarunkowań i* …, 2012). In the first half of the 20th century, large open-cast sand pits (Fig. 3) used for liquid backfill in deep coal mines were also created in the Szopienice area along the Brynica. In addition to the political barrier, a significant spatial barrier also separated the settlement from neighbouring towns and settlements. The integration possibilities of Szopienice are further limited by the negative impact of zinc and lead smelting and the tendency to locate residential functions inside the circle of industrial development. Continuous residential development in Szopienice with areas with similar functions in neighbouring region did not occur until the middle of the 20th century. In 1960, the town of Szopienice was incorporated into the city of Katowice, becoming its peripheral industrial district. (Szopienice formally obtained the status of a town only in 1951). Katowice's robust expansion between 1960 and 1980 was paradoxically least visible in Szopienice. Although some of the old, decapitalised buildings in the immediate vicinity of the lead smelter were demolished and a few large residential buildings erected on Szopienice's periphery, the image of the settlement remained the same – heavily industrialised, polluted and distant from the centre, with a peripheral location.

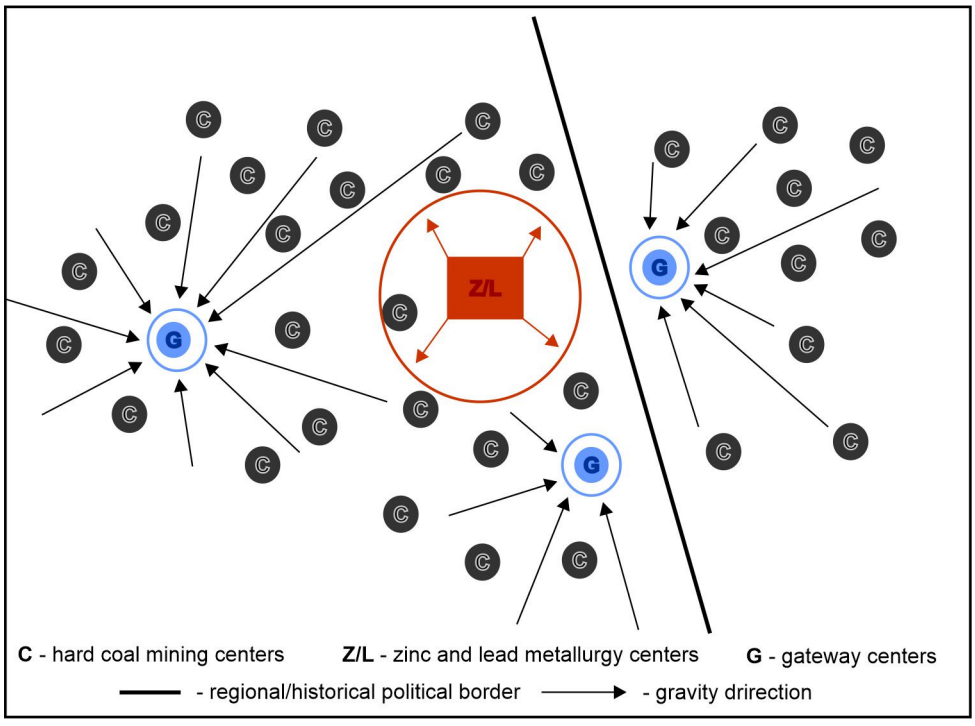

Fig. 4. Genetic and functional model of the Szopienice area
Source: authors' work

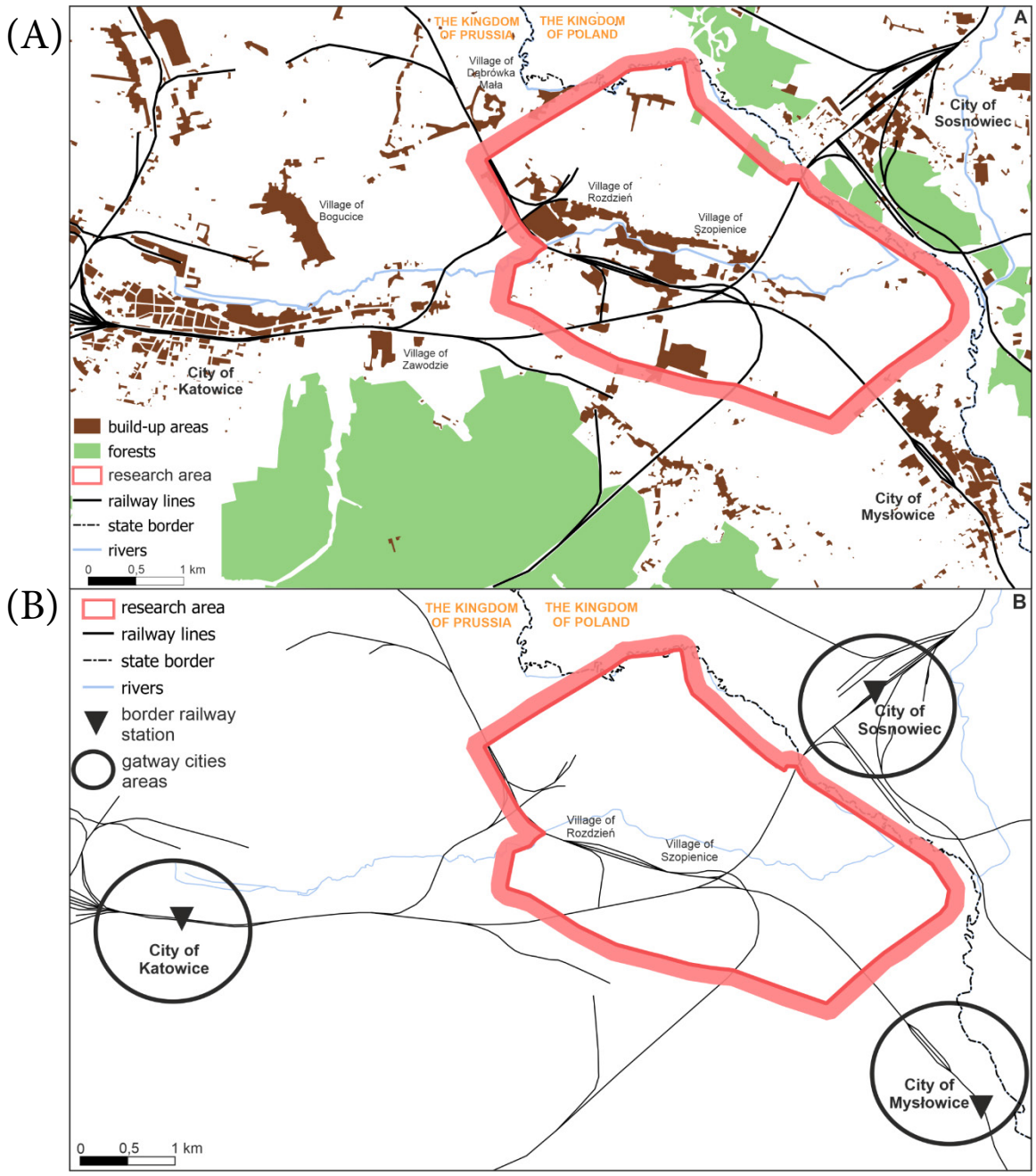

Fig. 5. Models – "in between" and peripheralisation (A,B). Spatial explanation of the Szopienice case
Source: authors' work

The spatial isolation of Szopienice at the core of the Katowice conurbation therefore has at least three dimensions: functional, morphological and emission-related. In the period following the collapse of socialism in Poland, there were significant changes in terms of this third dimension. These were associated with the liquidation or restructuring of the zinc and lead smelting industry. However, Szopienice is an example of an urban district located in a strict metropolitan core, which has formed around itself a very distinct "Zwischenstadt" area, shaped by as many as three factors. An in-between location in metropolitan cores facilitates the development of what is called "inner suburbanisation". This is a beneficial phenomenon, especially in post-industrial urban regions experiencing urban shrinkage. The core of the Katowice conurbation, at whose centre Szopienice is located, is precisely such a region.

4.1. Planning and strategic development challenges

The functional heterogeneity of areas such as Szopienice poses significant planning challenges. These challenges are the result of often contradictory phenomena and processes that determine the development of such places. On the one hand, the following should be noted:

- cessation of emissions of harmful pollutants related to lead, cadmium and zinc,
- the existence of valuable recreational areas in the vicinity (Valley of the Five Lakes),
- increase in residential property prices in Katowice,
- entrepreneurial interest in *brownfield* and even *blackfield* sites,

On the other hand, these factors are also of note:

- soil pollution in a significant part of the area in question,
- the district's relatively unfavourable image among Katowice residents,
- the large proportion of industrial and functionally derelict areas in the district's spatial structure (*Strategia rozwoju miasta*…, 2015; *Studium Uwarunowań*…, 2012; Kantor-Pietraga et al., 2023).

Brownfields pose an important challenge in the district (Fig. 6). Although their area has decreased from the 1990s to 2022 to 35.65% of the total study area, they still present a significant planning challenge. Today, succession processes are underway on these brownfields, with the proportion of forest gradually increasing in the study area (14.35%) in 2022, thus equalling the percentage noted in the 18th century (15.79%). The second form of land use accounting for a significant percentage of the study area is standing water, with a current figure of 10.13%. However, the largest increase in these waters, of less than 6%, occurred before the 1990s. This was because sand mining was abandoned at the end of the socialist period, which contributed to the pits systematically filling up with water, accounting for as much as 14.39% of the study area at the end of the 1950s.

Urban planning contrasts also lead to inevitable conflicts. One heavy-metal-related plant, which recycles batteries, is still in operation. It is also a producer of refined lead and sulphuric acid and is located in close proximity to residential developments. Another planning conflict relates to developing the Morawa Pond area for recreational and residential purposes. The district's largest cemetery is located 30 metres from the pond's edge. This location is in breach of the law, but above all

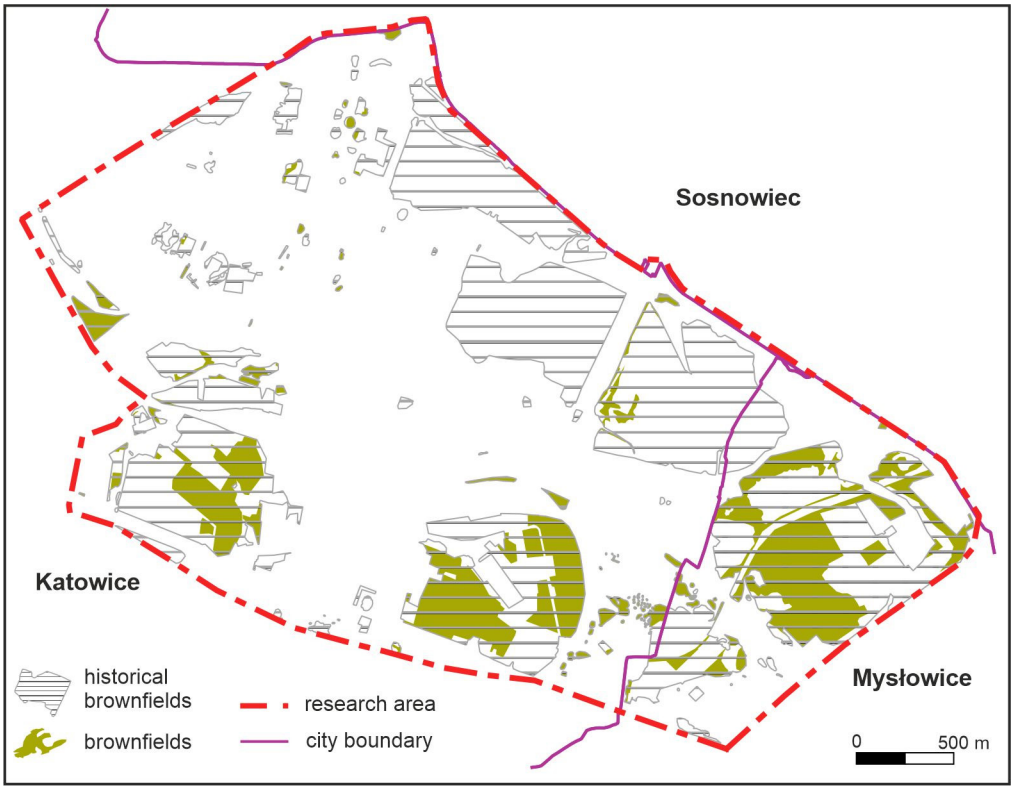

Fig. 6. Distribution of post-industrial areas
Source: authors' work

affects the possibility of further developing this pond for recreational purposes. It is also a body of water accessible for bathing and fishing. In this part of the district, another significant problem is the course of the administrative borders of two more cities, Sosnowiec and Mysłowice, which divide the area of the local anthropogenic lake into three parts. In the Szopienice area, the lack of coherence between the activities of the local authorities in relation to the area is apparent, while at the same time the consistency of objectives is indicated in the *Master Plans* (Kantor-Pietraga et al., 2023) These discrepancies stem from the differences in wealth between the three cities, the priorities of the municipal authorities, and also the inability of the Upper Silesian and Zagłębie Metropolis (GZM Metropolis) authorities to implement such projects at the operational level.

Given the development of Szopienice to date and the need to change the image of the post-industrial district, decision-makers' and stakeholders', attention should be focused on multidimensional future development. To be more specific, several key actions can be identified:

- to develop new residential construction on uncontaminated land and land earmarked for decontamination,
- to give the water area new significance, taking into account the needs of local residents, recreational visitors and, on the other hand, protecting biotic nature,
- to intensify activities relating to the district's immense industrial and cultural heritage. (where the challenges are perhaps greatest),
- to revitalise patronage settlements of housing estates ("hard" and "soft" projects).

In terms of tighter integration within the GZM metropolis, which is likely to have a legal system similar to that of Warsaw, areas such as Szopienice will almost certainly be helped by top-down management and measures, which should boost the chances of achieving the goals indicated above.

5. Discussion

As research shows, functional heterogeneity within large urban regions results in the formation of in-between areas. In spatial terms, these become apparent as in-between suburbanisation (Spórna & Krzysztofik, 2020). The development of new residential areas between two or more cities significantly strengthens the demographic potential of these cities, while limiting the phenomenon of definitional suburbanisation. The need to increase the cohesiveness of urban space is a common paradigm today (Dixon, 2007; Wu et al., 2018). In the case of polycentric urban forms, with underdeveloped areas in between, such development is even a natural phenomenon. In the case of polycentric shrinking regions, a policy of developing new residential areas even becomes an expectation (Runge et al., 2018). However, the question arises as to whether, in the context of the idea of creating metropolitan cores, this is an appropriate model in every case. Indeed, new development between cities in a polycentric region is most often suburban in character. In contrast, metropolitan cores are dominated by high-rise developments. In the latter case, it is important to strike a balance between the congestion of the development and population density, and the social needs of the residents and the intimacy of the development. In the Katowice conurbation, which is struggling with the process of urban shrinkage, the phenomenon of inner suburbanisation has been the norm for spatial planning and the social expectations of the region's transformation for about 30 years (Runge et al., 2018).

However, the phenomena described here definitely refer to in-between areas that were once used for agriculture. Szopienice, on the other hand, which has been struggling for two centuries with the problem and consequences of industrialisation based on zinc and lead smelting, is in a distinctive position. On the one hand, there is pressure to develop this locality, among other things on the basis of new housing developments (which is typical of internal suburbanisation); on the other hand, there are centrifugal (repelling) forces stemming from pollution, the (post-)industrial landscape or the societal perception of the area.

The spatial balance mentioned in the previous chapter between the attractiveness of the area in question and the limits to its development, which is also very evident in the land use policy and the functional structure, has a conserving effect on the direction of the district's development. These trends are also reinforced by Szopienice's peripheralisation within the space of Katowice. Interestingly, in the case of in-between areas developed on land previously used for agricultural purposes, peripheralisation does not play any role. It is not a barrier (Sieverts, 1999). In the case of Szopienice, the activation of the spatial peripheralisation factor is due to a similar type of land use occurring in the neighbouring city of Mysłowice – industrial and post-industrial areas.

However, in the discussion of peripheralisation, there is a view that under certain circumstances the periphery or areas treated secondarily (not centrally) may have an important role to play. In his traditional model, for example, Lasuén points out that a politically privileged city is not necessarily the most important economic centre, and vice versa (Lasuén, 1985). Indeed, during the industrial period, Szopienice and the surrounding areas were the most important economic centre within the boundaries of Katowice. Deindustrialisation and the move towards a service economy have resulted in the main development centres (political, economic and social) being located in the inner city. The economic function of this district is still important, but no longer the most important. An opportunity instead is presented by the concentration of leisure and recreational functions. Although in this respect there is competition for Szopienice from other recreational areas closer to the centre of Katowice, investment on an appropriate scale could change the face of the district. However, the project currently being prepared for developing recreational and leisure functions based on water areas is rather conservative in this respect. In the case of post-industrial cities, more spectacular and involved projects seem advisable in order to change the negative path towards dependency. Of course, from the point of view of the municipal authorities, Szopienice may be just one of a dozen or so equal neighbourhoods, without the need to fundamentally change and put this area on a positive reactive path. This is confirmed, for example, by the analysis of the Master Plan (*Studium Uwarunkowań i…*, 2012), in which industrial and warehousing functions that emphasise the district's negative urban image are balanced by recreational functions. It is these recreational functions, especially in a (post-) industrial area, that reinforce a positive public perception. In the case of Szopienice, however, confining the district to a negative, self-reinforcing development path may constitute dissonance for the development of the entire city of Katowice and also partly in relation to neighbouring Sosnowiec. It will also certainly not meet the criteria for strategic development of this part of the city stated by Albrechts and Balducci (2013).

6. Conclusion

Though today a district of Katowice in southern Poland, for decades Szopienice was one of Europe's largest centres of zinc and lead metallurgy. At present, it is the most challenging district in terms of planning and revitalisation in the biggest city in Central Europe's largest metropolis – the Katowice conurbation. The fact that such a space exists in the metropolitan core, four kilometres from this metropolis's downtown area, on the one hand stems from the complicated economic and political history of the place and, on the other, from the specific settlement pattern determined by the functions of the Katowice conurbation in the past and present. This article points out that, in the case of such complex settlement systems, attempts to explain contemporary paths and barriers to spatial planning should be based on implementing several theoretical approaches. In this case, these were based on conceptual explanations relating to functional heterogeneity, peripheralisation and in-between locations. Despite being characterised by locational dissimilarity in the relationship (the locality in question, and the environs of that locality), each of these explanatory attributes forms a system of superimposed factors, stabilising the transformative possibilities of the area in question. In the case of Szopienice, once one of Europe's largest zinc and lead smelting centres, this stabilisation has the dimension of being trapped on a negative self-reinforcing development path. Opportunities for reactive change are only partially visible in the eastern part of Szopienice. From this explanatory perspective, the analysis presented in the article should also prove useful in terms of planning decisions in (post-)industrial and (post-)mining regions, and not only those in this part of Europe.

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