

ISSN 2449-9781

NR 22  
(2022)

# BIBLIOTEKA REGIONALISTY REGIONAL JOURNAL

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## Urban Functional Areas and Their Relations with the Surroundings – an Example of Metropolitan Areas

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### Miejskie obszary funkcjonalne i ich relacje z otoczeniem – przykład obszarów metropolitalnych

DOI: 10.15611/br.2022.1.02

JEL Classification: R1

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*Quote as:* Korenik, S. (2022). Urban functional areas and their relations with the surroundings – example of metropolitan areas. *Biblioteka Regionalisty. Regional Journal*, (22).

**Abstract:** Modern cities are undergoing intensive changes along with increasing globalisation and developing a knowledge-based economy. As a result of these changes, modern large cities, known as metropolises, are also emerging. With their creation, the surroundings of these cities are also changing. Urban functional areas are being created, often referred to as metropolitan areas. The further surroundings of large cities are also undergoing transformations, however, not always perceived as positive.

**Keywords:** city, metropolis, urban functional area, region, urban sprawl.

**Streszczenie:** Współczesne miasta ulegają intensywnym zmianom wraz z narastającą globalizacją i kształtowaniem się gospodarki opartej na wiedzy. W wyniku tych zmian powstają także nowoczesne duże miasta określane mianem metropolii. Wraz z ich tworzeniem zmienia się także otoczenie tych miast. Powstają miejskie obszary funkcjonalne zwane obszarami metropolitalnymi. Dalsze otoczenie dużych miast także ulega przekształceniom, przy czym nie zawsze są to pozytywne przekształcenia.

**Słowa kluczowe:** miasto, metropolia, miejski obszar funkcjonalny, region, *urban sprawl*.

## 1. Introduction

Urbanisation is a specific phenomenon that accompanies the development of humanity and determines it to a large extent. In colloquial terms, urbanisation is understood as a process of a faster increase in the number of city dwellers than in the surrounding non-urban areas. This phenomenon is based mainly on the fact that cities (large ones) attract people living in rural areas and small towns. The reasons for this process are twofold (Kuciński, 2002, pp. 229-230). Firstly, the development of cities is associated with the increasing importance of non-agricultural forms of human economic activity, which, due to their specificity, require the necessary concentration of the human and intellectual factors as well as the appropriate size, range, and durability of the sales market.

Secondly, people from rural areas need to satisfy their higher-order needs, and urban-type settlement units offer this possibility. Those living in the countryside migrate to the cities hoping for a better life. Rural areas are often underdeveloped, while the city is associated with an attractive standard of living (Fierla, 2005, p. 193). It should be remembered, however, that urbanisation in the current reality is becoming an extremely complex (multi-faceted) economic, social, and cultural process. Moreover, it is defined in time and space, making it difficult to correctly perceive it and, consequently, to determine its effects on current and future societies.

This paper focuses on two basic phenomena which are closely related, namely contemporary urbanisation and metropolisation. In addition, particular emphasis was placed on forming complex spatial objects, such as urban functional areas and their impact on the socio-economic space. A critical analysis of the literature on the subject, a descriptive method and a heuristic approach were used to implement the adopted assumptions.

## 2. The development of modern large cities in contemporary realities

In the modern world, various kinds of intensive changes and processes occur in all areas of human life. They are the result of the interdependence of simultaneously occurring phenomena: the technological revolution based on information technologies, shaping the global economy and changing the development paradigm related to the transition from an industrial economy to a knowledge-based economy. In turn, the occurring transformations are not distributed equally in space. On the contrary, despite space-time dispersion, one observe the accumulation of economic activity processes in limited, strictly closed areas – large cities. However, not all cities are becoming the centre of such modern transformations. Large ones in highly developed countries are leading the way. A unique role in explaining these processes is attributed to the phenomenon of metropolisation, which is the outcome of transformations that are in progress in settlement systems under the influence

of globalization. As a result of metropolisation, the position of some large cities in the world economy has been significantly strengthened. Moreover, metropolisation consists in forming the spatial structure, which not only accumulates global potential but also changes the existing relations between such a centre and its surroundings. This ultimately results in the development of urbanised space. However, it is essential to mention that the nature of this phenomenon is functional and not morphological. Contemporary urbanisation is characterised by a multitude of transformations, especially in the area of large cities and their immediate surroundings. The impact of cities on their surroundings is rooted in various phenomena and socio-economic transformations in the spatial dimension. The result of these changes is undoubtedly visible in the process of suburbanisation and the increase in the scale of mobility of modern societies. The intensive development of transport systems and the broadly understood communication results in the greater accessibility of individual elements of the city structure and solid functional relations with its surroundings, which manifest themselves in many areas of socio-economic life, e.g. in economic, cultural and educational cross-sections. Contemporary large, modern cities are centres of exchange of goods, capital and ideas. They are becoming attractive business locations and, by creating good living conditions, draw in new residents. The increase in the population is accompanied by the expansion of the area of their influence, mainly due to suburbanisation. At the same time, activities like commuting to work, shopping and cultural facilities are being extended. This has consequences in expanding the municipal infrastructure network, i.e. energy, water, and sewage. Waste-management covers ever larger areas. As a result, such transformations make it necessary to implement an entirely new method of managing more extensive and complex urban organisms and their immediate expanding base. As Śleszyński rightly pointed out, “within its administrative borders, the city ceases to be an independent and self-sufficient unit in terms of human resources and the daily rhythm of life. There is an increase in circulation displacements directed inwards (nodes) from places of residence to places of concentration of work and services” (Śleszyński, 2013, pp. 173-197). As a result, urbanisation causes significant changes in the immediate vicinity of urban centres as well as in entire regions (Lendzion, 2004, p. 9) because the city is no longer a point in space isolated from the rest (Dębska, 2011, p. 36), but also becomes part of a larger whole, linked by increasingly complex relations and functions. A negative manifestation of these processes in the vicinity of particularly large cities (the so-called metropolises) is the marginalisation of large areas of the region in socio-economic cross-sections and the processes of internal peripheralisation (i.e. the marginalisation of some areas of spatial units forming such areas). This was indicated, among others, by Jałowicki, who stated that metropolisation is primarily the weakening of relations between a metropolis and its surroundings in favour of developing links with other metropolises (Jałowicki, 1999, p. 4). In practice, the process of shaping urban centres causes various effects on the region's space, which depends on many factors.

In the case of every city (this is particularly evident in large cities), two primary zones of its impact can be distinguished. One of them is the direct impact zone, comprising a suburban zone with strong ties with the core centre. In such areas, due to the increasing intensification of socio-economic processes, one can observe dynamic spatial changes (Bajwoluk, 2008, p. 109). The second zone is the zone of influence, in which, despite the visible influence of the city, the ties with it are much weaker due to the increase in the distance from the city centre and the weakening of various relations and interactions. When the considered urban centre is a metropolis, and when determining the zone of its impact, the functional criterion is considered, and then an area and a metropolitan region are distinguished. Like the suburban area, the metropolitan area is characterised by strong relations with the city. What is important in metropolitan areas, is that the development of metropolitan functions and the broad functional integration with the metropolis take place in them. At the same time, the metropolitan region is a zone of weaker dependencies (Dębska, 2011, p. 37), where the impact of the area's core does not cover all areas of socio-economic life. In terms of these issues, a variety of approaches in theory and practice can be observed. It is particularly relevant to describe the relation between the metropolis and the metropolitan area. According to some researchers, the metropolis is only the metropolitan area's core, while others understand the metropolis as an urban centre and units located in the immediate vicinity of the main city (Nowak, 2018, p. 51). Some authors use the term 'area' to indicate the area excluding the urban centre (Maik, 1997, p. 90). It can be assumed that a metropolis is a core (centre), and a metropolitan area is a space functionally related to it. In addition, the metropolis can be defined as the centre and the metropolitan area as the peripheral zone.

A metropolis and metropolitan area can be described as an urban functional area, while the metropolitan region also covers the zone of influence. The Functional Urban Area (FUA) is defined in various ways, as can be found in the Polish National Spatial Development Concept 2030 (KPZK 2030). This document is no longer in force, although the definitional interpretation adopted there is correct. Thus, according to KPZK 2030, FUA is a spatially continuous settlement system composed of administratively separate units (urban, rural and urban-rural communes) consisting of a compact urban area and an urbanised zone functionally related to it. It is integrated by the forces of interconnections occurring within this area and the superior role of the so-called core (dominant) city in shaping these relations (e.g. commuting to work, the intensity of development, volume of flows of goods and services of various natures, etc.). A critical (and at the same time a problematic) task is the complete delimitation of this type of area because the relations mentioned above occur regardless of the adopted administrative boundaries (Bartosiewicz, 2016, p. 38), and their different range of influence is variable over time and subject to seasonality. The correct delimitation is vital because it guarantees the optimal management of such an area – when a functionally coherent area is not treated as a whole, and decisions are made by individual spatial units included in it,

their management system becomes ineffective, which may result in the inhibition of socio-economic development (Danielewicz & Turała, 2011, p. 110). Therefore, for the delimitation to be precise, it is necessary to obtain detailed data from as small as possible units, which unfortunately is very often difficult or even impossible due to the smaller number (lack) and frequency of obtaining data in the lowest-level units, i.e. in cities and housing estates (Szołek, 2006, p. 43). In addition, complications are caused by the multitude of functions and the presence of individual features, such as the size of the city (Tonev & Dvořák, 2017, p. 108), its location, relations with other cities, etc., hence the range of the city's influence depends mainly on its the size and nature of the functions performed (Dębska, 2011, p. 36). To date, several different methods of delimiting such areas have been developed due to the distinct ways of defining the concept itself and the adopted criteria. In the case of metropolises and metropolitan areas, metropolitan functions often become the distinguishing feature and can be the primary criterion for the delimitation carried out. In turn, in the report of the Organization for Economic Cooperation and Development from 2011 on urbanised areas in Poland, it is proposed that data on the structure of the population and commuting to work should be taken into account when determining the functional areas of cities (OECD, 2011, pp. 26-30). Yet, in accepting such criteria, Szołek indicated the need to consider the labour and real estate markets (Szołek, 2006, p. 43). According to this author, adopting such arrangements results in narrowing down such areas only to urbanised areas, which are within reach of the city (Szołek, 2006, p. 43). Unquestionably, an additional problem with this type of delimitation is caused by the dynamics and intensity of the changes taking place in these types of areas and the multi-directionality of these transformations. Therefore, to avoid possible omissions of spatial units in classifying them as such areas, there are suggestions to determine not the actual, but rather the potential range of impact because the variability of the metropolitan space may make the analysis of the boundaries of the subject of research carried out at a given moment obsolete in a short time. However, this is an imperfect solution with a high probability of error (Szołek, 2006, p. 43). Generally, the new phenomena causing such significant changes in the functioning of cities are characterised by the apparent disappearance of the borders between the countryside and the city. In addition, what makes the perception difficult, is the emergence of intermediate settlement forms, which changes the existing dichotomous division of the settlement system.

### **3. The urban sprawl of large cities and their impact on the surroundings**

Apart from the issue of designating metropolitan areas, their development of them is likewise significant. The contemporary development of large cities, especially in their vicinity, is accompanied by progressing urbanisation and urban sprawl. This

phenomenon intensified in the second half of the 20th century due to dynamic changes in the demographic structure caused by population growth and substantial migrations. Currently, the growth of cities is considered one of the most significant challenges of modern times. Urban sprawl is characterised by the movement of people from the city centre to peripheral areas and the spread of residential buildings in rural areas. The space is fragmented because the buildings are most often dispersed due to the proximity of agricultural areas (Litwińska, 2008, p. 40). The cause of urban sprawl is generally the development of civilization, particularly in the socio-economic cross-section, which includes, for example, the improvement of the material situation of the population through a rise in income. Such shaping of these values increases the standard of living, resulting in changes in social needs and lifestyle transformation, and thus, people began to prefer living in their own homes, in a clean and healthy environment, with better aesthetic values. Such conditions could only be provided by areas far from the centre, preferably outside the city. Settlement in the city's periphery (suburban) was also favoured by the spatial policy of the communes located around the central centre. Investments were made in infrastructure, and more and more land was allocated for non-agricultural purposes. This resulted, among others, in lower prices of building plots, which in turn created attractive conditions for potential residents (Litwińska, 2008, pp. 38-39). Living far from the centre, i.e. the place of work, education and the use of services, has enabled the development of the automotive industry. Individual transport has become popular as the primary means of transport (although public transport also has developed). This process led to the increased spatial mobility of the population (Grochowski, 2011, pp. 168-169) and further urbanisation of rural areas, taking over the housing function, previously performed only by the city.

In addition to the displacement of the population outside the central centre, the emergence of metropolitan areas is associated with pushing many other functions from the very centre to the neighbouring areas. These are often functions that require appropriate conditions that the city can no longer provide, e.g. large spaces, low land prices and good transport accessibility (Rynio, 2010, p. 201). Transferring functions outside the metropolis concerns, for example, health care and universities, and this led to the emergence of modern, technologically advanced hospitals and clinics and campuses on the outskirts of the metropolis. What is more, investors often prefer the metropolitan area as a place for locating enterprises, if only because of the access to extensive human resources from the metropolitan area, while a well-developed transport network often encourages this. Thanks to the proximity of the metropolis, the business sector has access to a large market, while developed transport connections facilitate the distribution of goods to other urban centres (Rynio, 2010, p. 201). In addition to traditional industrial plants, there is also a high-tech industry. By the taking over of those functions, the peripheral zone of the metropolis becomes similar to it (i.e. it becomes a *de facto* core). As a result, it is transformed into an area characterised by high innovative potential, high competitiveness and providing

high quality of services (Rynio, 2010, p. 201). It can be stated that the qualitative potential of the central centre spills over into the metropolitan area (Kudłacz, 2013, p. 82), characterised by robust economic, social, transport and institutional ties with the core city (Bartosiewicz, 2016, p. 39), manifested mainly in commuting to work, land development, infrastructure, the flow of goods and services, and the relation between housing and the labour market (Kociuba, 2015, p. 41). As a consequence, the transfer of people, goods and information emerges.

Regarding the issue of metropolisation, two views on the relation between the metropolis and its surroundings are distinguished in the literature (Kudłacz, 2010, p. 54). The first states that a metropolis cannot exist without a region due to the multitude and strength of links connecting it with its hinterland. Together they form a harmonious whole, subject to further development. This type of relationship was present in the industrial economy. The city used the region's potential and exploited it, thanks to which it could achieve a high rank, but it depended on its surroundings. The stronger the metropolis, the stronger was its region (Brzozowska & Robak, 2011, p. 74), which mainly provided human resources and raw materials. The second view is based on the belief that the metropolis is a strong and distinctive object, and it does not form a unity with it, which means that it can independently develop equally dynamically without the region. In this approach, the metropolitan area is only a base of no great importance. Relations with it weaken or are broken, while paradoxically, another metropolis, often very distant geographically, becomes a close neighbour. It appears that both views exaggerate some aspects, but what is certain is that many significant changes are taking place due to metropolisation in the centre and on the periphery. Such shaping of these phenomena results in the emergence of a new spatial arrangement, in which functions are divided within the functional area: the central city becomes a centre of management and administration, all types of consulting, information processing, provision of higher-order services, and the headquarters of large corporations and a place of work and education (Danielewicz & Turna, 2011, p. 109). At the same time, apart from some metropolitan functions, the metropolitan area begins to perform, in particular housing, recreation, leisure (Szólek, 2006, p. 35), supply, production and communication functions (Rynio, 2010, p. 201).

Furthermore, when considering the relations between the region and the metropolis, it should be pointed out that regardless of the views on their links, a significant positive effect of the impact of the metropolis on the region is that together they are a place of concentration of the country's significant potential, stabilise its economy, attract further development factors (Miszczak, 2011, pp. 259-260), and image functions (i.e. perceiving the region through the metropolis). It should be remembered that the metropolis usually stimulates the entire region's growth, for example by spreading innovation and lifestyle (Brzozowska & Robak, 2011, p. 74). However, today, some metropolises are at such a high level of development that the resources from the environment are insufficient to meet their needs on the way to becoming competitive on the world stage. These centres, unable to benefit from

cooperation and develop internal ties, cut themselves off from the region, thus the peripheralisation of the metropolis' surroundings is taking place. Afterwards, the region does not perform its essential functions, and development polarisation occurs. Another cause of peripheralisation is the metropolis attracting (drawing) resources from its surroundings, which is usually the case with highly qualified young people migrating to the city searching for work (Brzozowska & Robak, 2011, p. 74). By losing such potential, the environment also misses out on dynamic development. Although the peripheries of the metropolis often benefit from the presence of such a strong centre, they also frequently struggle with many related problems. The main reason for these problems in metropolitan areas is the intensification of urbanisation processes, and more precisely, suburbanisation and deurbanisation – because of these processes, the population in this zone increases significantly. The natural environment is likewise subject to intense urbanisation pressure. More and more areas, often of great landscape or natural value, are allocated for housing development, resulting in the degradation of these areas and the loss of their attractiveness. The same is true for agricultural land, whose resources are shrinking. The agricultural function of rural areas is limited in favour of other previously mentioned functions of the metropolitan area (Kołodziejczak et al., 2019, pp. 37-42). Apart from the fact that the immediate vicinity of the metropolis is an attractive place for investors, it constitutes a place where burdensome undesirable functions in metropolises, such as landfills, are “pushed” (located) (Pater, 2011, p. 288). In addition, the emerging development often disturbs the spatial order and harmony – as new buildings and entire development estates are being built among the old buildings, which differ significantly from it. Villages lose their rural character in favour of an urban one: the borders between the metropolis and neighbouring communes become blurred (Liszewski, 1997, p. 123). Environmental pollution and energy consumption are also increasing. The increase in the number of inhabitants, often educated and wealthy in the peripheries, also causes social segregation, limited interpersonal contacts and loss of identity with the place of residence (Kowalewski, 2005, p. 133), as well as the creation of gated estates. Due to the necessity of daily commuting to the city, the inefficient transport infrastructure needs to be expanded, which is associated with high costs. The same applies to water, sewage, electricity, gas and waste management infrastructure. Such transformations cause an increase in the costs of infrastructure development and operation due to the dispersed development characteristic of such areas. Progressing globalisation and metropolisation cause an increase in the intensity of changes in cities and peripheral areas. The multitude of unfavourable changes forces the authorities to take action to limit the negative effects of these processes.

## 4. Conclusion

The transformation of the space of large cities and their functional surroundings, taking place both under the influence of globalisation and the shaping of the rules of the knowledge-based economy, results in a gradual uniformisation of space on an international scale; at the same time, its fragmentation and privatisation occur. The expression of socio-economic changes is solidarity, individualisation, and the predominance of commutative ties, leading to changes in the lifestyle of the metropolis's inhabitants, behaviour and space use patterns. These types of changes result in growing visible differences in life in the areas of large cities and their functional areas and beyond. These differences increasingly take on the character of civilizational changes, leading to the creation of a dual world of modern metropolises and their surroundings, as well as peripheral areas, excluded from development processes, and increasingly backward in terms of civilization.

To sum up the above considerations, it should be pointed out that the formation of contemporary metropolitan systems is an objective phenomenon and is often subject to spontaneous processes. In such a situation, it is important to determine appropriate criteria for the delimitation of these areas. Only the correct delimitation of a metropolitan area provides the right basis for working out good urban policy guidelines that will determine the development of that area. Undoubtedly, a functional approach, as has been argued, is the right one. In addition, we are observing a process of 'spillover' of these arrangements in socio-economic space. These transformations make significant changes to the environment of such a system, and affect all basic forms of socio-economic life, starting with urban layouts and culminating in the formation of new economic functions. In addition, these phenomena are subject to intensification, which often results in the build-up of spatial conflicts affecting the attitudes of these sites. Therefore an important role is played by the actions taken by the government and/or local administration aimed at mitigating threats and avoiding negative situations – before they fully develop.

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