



*Jacek Kaczmarek, Adam Dąbrowski*

University of Lodz

[jacek.kaczmarek@geo.uni.lodz.pl](mailto:jacek.kaczmarek@geo.uni.lodz.pl), [adam.dabrowski@uni.lodz.pl](mailto:adam.dabrowski@uni.lodz.pl)

JK  <https://orcid.org/0000-0003-1750-1592>

AD  <https://orcid.org/0000-0002-8424-7371>

## *Useful City* or the truth about systemic context of depopulation and shrinking cities

**Abstract:** In recent years, the phenomenon of depopulation and shrinkage of cities has been observed. The depopulation of large cities is undoubtedly a demographic fact. The process of urban depopulation has recently become the theme of numerous reports and alarmist research works. However, it can be concluded that the diagnostic background of this phenomenon has got a narrow methodical foundation. As a measure of depopulation, the number of permanent residents is usually taken (according to the place of residence). Thus, the diversity, complexity and dynamics of processes taking place in contemporary cities are ignored. Postmodern reality appears as a segregated, separated world. Therefore, the diagnostic approaches currently used should be discussed. Going further, one can conclude that the measurement of depopulation and shrinkage of cities by the number of permanent residents is a simplification, because it ignores the essence of urbanity, which is the diversity of values offered by the urban space of exchange (i.e. the utility value). The article presents therefore the new concept of the measurement for shrinking of cities. Ideas discussed in the paper are expected to stimulate critical exchange of views among urban researchers. In the authors' opinion, the sin of social-economic geography and spatial economics consists in boiling down great human affairs to aspects of correct representativeness.

**Key words:** city, depopulation, system, center of life interest, usability

### Foreword

According to Torsten Hägerstrand, the meaning of the world is movement. In his last work we find the following statement: “For Aristotle, motion was the key to understanding nature. He defined the concept of motion very inclusively. It not only pertained to mobility but also change. This could be quantitative in the form of growth or recession, or qualitative as when white is transformed into black. (...) In nature there is certainly nothing older than motion, emphasized Galileo” (Hägerstrand 2004, p. 315). The fundamental goal of scientific investigation is to

find out about the elementary principles of the world that we examine using the scientific method. Nevertheless, we may not forget that general laws cannot be inferred from experience via induction since they are critical for conducted experiments. For over a dozen years, publications authored by researchers dealing with urban studies have been soaked with the scary ghost of *depopulation and shrinking cities*. Many studies end with dramatic appeals stating that, e.g., “Shrinking cities create new challenges for urban policy and spatial planning. Administrative and local authorities at different levels need to take effective actions to prevent negative consequences of the process” (Musiał-Malago 2017). Against this backdrop, a question should be raised about diagnostic foundations of urban shrinkage: are not the foundations of this valid paradigm of urban studies resting on loose sand? This paper aims to critically assess the shrinking city concept and stresses the need to re-define the notion. The main thread proposed for our considerations is trans-disciplinary by nature and stems from critical discussion held between an economist and a geographer active in the field of urban development studies. This discussion paper consists of three parts – equivalents of the three stages of critical dispute over diagnostic foundations and successful forecasting of the effective development of contemporary cities. These parts are titled: Critics, Concept, Epistemological context, and Systemic context. Motto for this discussion comes from Tomas Tranströmer’s (2017) poem “Schubertiana”, which, among other big city metaphors, compares a city to “a flurry of shoes [which] leave no prints.” (translated into English by Robert Fulton). Thousands of prints left by these countless pairs of shoes in the streets of shrinking cities lead to a revealing, albeit not totally new, conclusion: it is worth looking at the past from a slightly different angle than before. New is also Old but seen in a slightly different perspective. At the margin of our deliberations, it is worth mentioning that the use of metaphors in scientific studies is rarely innovative. Some of the so called “priests of the Temple of Science” reject any form of thinking that goes beyond the boundaries of naturalist approaches. Borrowings from literature or other metaphorical content are viewed as heresy that destroys the solid structure of scientific, logical inference. However, one may not forget significant theoretical accomplishments of researchers with such clear naturalistic provenance. In considerations devoted to the use of metaphor in social and economic geography we come across some meaningful opinions: “In geography metaphors are phrases borrowed from everyday language and literature, formulated within the framework of geographic knowledge or other fields of cognitive science. They play a creative role in expanding knowledge and shaping its development perspectives” (Chojnicki 2003, p. 18). We need to unambiguously stress that metaphor is not about knowledge, but it is a powerful inspiration to discover new aspects in, e.g., urban studies (Maik 2011, p. 327). Thus, by distancing oneself from the world of arts and not being sensitive to beauty inflicts irreparable losses on scientific reasoning.

## Critics

Research studies on shrinking cities available in many publications from diverse fields of social sciences focus mainly on effects of different occurrences while their causes go unnoticed, overlooked or completely ignored. This is nothing new in how the world is explained. In the first part of the “Republic Plato” observes “But to me, Socrates, these complainers seem to blame that which is not really in fault” (t. 1, 329 B). This means the principal goal is to find the primary cause and reveal the substance of why cities are shrinking and get depopulated. What has been achieved so far in this respect should be viewed as unsatisfactory. Depopulation and shrinking cities, processes which give sleepless nights to hard working researchers and administrators of urban spaces, what are they about? Amongst many definitions, the most frequently quoted are those formulated by Tadeusz Stryjakiewicz and Robert Krzysztofik. Both researchers agree that the pre-condition for urban shrinkage is the drop in the number of urban residents within administrative boundaries of cities. The first assumption is that “the shrinking of cities is a spatially defined loss in population that can be explained with complex determinants and associated with the scope of possible mega-territorial consequences” (Krzysztofik 2013, p. 46). “Shrinking cities are, above all, about the drop in the number of residents and the resultant reduced resources of labour, lower economic performance indicators, impaired quality of housing and social infrastructure, loss of real estate value, etc.” (T. Stryjakiewicz et al. 2014, p. 11). In detailed studies depopulation indicators provide grounds for inference about the economic condition of cities, their social situation, and cultural climate. Undoubtedly, “explaining depopulation and pointing to its consequences are constant research components in geographic sciences; one needs to note that recently depopulation is often compared to the shrinking of cities. In fact, the term “depopulation” in its narrow sense is the synonym of shrinking. However, the scope of “shrinking” has got a wider dimension that takes account of research elements in geography not linked directly with human geography – mainly spatial, economic, social, infrastructural, administrative or financial aspects” (Kantor-Pietraga 2014). We need to appreciate efforts made by many researchers and take note of their explanations of the process, which reveal various circumstances of urban shrinkage (Kantor-Pietraga et al. 2012, Harańczyk 2016, Musiał-Malago 2016, 2018a, b, Krzysztofik, Szmytkie 2018, Krzysztofik 2019, Jaroszewska 2019, Cienkosz 2020). Yet, these detailed analyses based on statistical evidence, are often significantly simplified. In one of many valuable works (in cognitive terms), the assessment of demographic situation of Łódź leads to the conclusion that, e.g., “in addition, a drop in the number of population contributes to the growing number of uninhabited buildings, closed stores and offices, which, in turn, decreases the value of real estate. Smaller number of users of public infrastructure may generate higher per capita cost” (Kryńska 2015, p. 183). Undeniably, the population of Łódź is shrinking, but how does it limit the number of urban space users? We do not know as this information is not provided in the context of a shrinking city. By using data about the number of perma-

nent residents only, we get a narrowed picture of real transformations in the urban space and alarmist visions which cannot be fully explained through inductive inference (Ogrodowczyk, Marcińczak 2014). Studies conducted for many years on Japanese cities reveal the need to compare daytime numbers of urban space users with the number of permanent residents (Mydel 1993, 2012). Obviously, population density in downtown areas decreases but it happens mainly at night. During the day, traffic intensity and daytime population density radically increase. The analysis of the so-called daytime and nighttime population belongs to the canon of social and economic geography studies (Budzynowska, Węclawowicz 1984). Hours during the day, subsequent days of the week, seasons draw urban space use patterns (Kaczmarek 1996, Kwan 1998, 2004, City of Melbourne 2013, Parysek, Mierzejewska 2013). The principal feature of big cities is their versatility and the dynamics of functions. Cities are melting pots filled with diverse activities of individual users and institutions, entrepreneurs, tourists, etc. The substance of a city lies in versatile, dynamic intensification of activities. Cities are on the move, they are spaces of exchange of people, capital, information, goods, and ideas (Kaczmarek 2012). Usually cities never sleep, they are not bedrooms. Sometimes, mostly during holidays, they fall into idleness. However, such idleness can hardly be considered depopulation, which was noticed by the insightful eye of the artist when he was in Italy almost two hundred years ago (Berlioz 2019, p. 239). Action runs in the blood of cities (Filar, Kubicki 2012), which is why flows are manifestations of the sense of existence and agency of cities. It is worth returning to the concept of ancient philosophy: "First then we must understand that place (city) would not have been thought of, if there had not been a special kind of motion, namely that with respect to place (city). Of this kind of change there are two species: 1) locomotion on the one hand and, 2) on the other, increase and diminution." (on the motives Aristotle 2003, p. 89, 211a). Cities are about changes, not about the number of residents locked in their bedrooms. Unfortunately, the latter is what we learn from the parameter informing about the number of permanent residents, so widely used in diagnostics. We trap residents in bedrooms and disregard their outdoor activities. There are also cities that never sleep, for which information about the number of permanent residents has got limited epistemological power as a tool to learn about the mechanisms underpinning urban structures. Neither should we overlook significant difficulties in estimating the number of permanent inhabitants or users of selected areas. Further problem lies in the selection of territorial units and databases covering different fields of social and economic activities (Śleszyński 2011, 2015). Studies on changes in the use of urban space are viewed as very much time-consuming, methodologically complex, and burdened with high risk. They are not carried out very often, especially comprehensive studies focused on the share of daytime and night-time population in using urban space. Obtained results reveal actual problems involved in managing the urban space and are critical for effective urban governance. At the same time, these results inform about limited explanatory capacity of parameters based on the number of permanent residents (which, as shown above, is deeply problem-

atic). In 2005 the size of daytime and night-time population in Warsaw was estimated. Daytime population ranged between 2.41 and 2.46 million people while numbers for the “quiescence city” oscillated around 1.91–1.96 million of night-time population (Bijak et al. 2007). Thus, focusing empirical studies only on permanent residents of a given city may lead to cognitive astray. It is worth to mention at this point an interesting example from the works of Śleszyński (2018). On the basis of telemetry studies, it was found there that the difference between the identified urban users and the number of endogenous population registered by the official data of the Central Statistical Office balances amounts to 200,000 people. This number clearly explain the sense of development of the discussion about the methodological aspects of the shrinkage of cities process. Currently there are many publications on shrinking cities however, the majority are totally based on official, statistical records concerning population, economic and spatial data. This approach does not exhaust the complexity of the issue under study. Thus in our opinion studies on urban shrinkage should include both an empirical field study, and available statistical data. Besides, studies should take account of a much wider context. By reducing the considerations only to the central city, we may get a distorted picture of reality. Detroit, often referred to in Polish literature, must be seen as a part of a metropolitan area and region: “Regardless of the end-result, Detroit, as a model example of a shrinking city with 50-year experience of continuous loss of residents has become a point of reference for many other areas experiencing similar processes. In a narrow approach, this urban organism is dying. In a wider approach, Detroit is only a fraction of a well-functioning metropolitan area in a well-developed macroregion. Seen from this angle, the city does not decline but evolves towards forms consistent with a new, emerging pattern of social and economic infrastructure. Within the metropolitan area, there are relationships which are not restricted only to the territory of the city. The emerging structure has different space-time meshes in a network whose nodes are centres of exchange of information and services. One of such nodes is and will be the downtown of Detroit” (Trębacz 2013, p. 95). The above paragraph clearly justifies the need to consider wider geographical contexts. Once again, we need to stress that a city as a space of exchange is a dynamic structure of a changing operating profile and cannot be boiled down to the number of residents staying at home. A discussion between an economist and a geographer held against the backdrop of literature review has led to the formulation of basic research problems presented, obviously, as questions addressing reality that needs to be revealed. The following questions were raised: 1) Is the idea of depopulation and shrinking cities appropriate to describe transformations in urban structures? 2) Or is it a tool of the propaganda of fear and a ‘fashionable’ trend in urban development policy? 3) Can we build an indicator that would help us get a comprehensive understanding of a city? Further stages of research procedure discussed in the paper will help in reaching to the heart of issues underpinning depopulation and shrinking of cities. This is how we intend to unveil the truth about key processes that exert powerful impact upon the development of contemporary cities.

## Concept

The above critical discussion with many authors of research publications has already highlighted that the diagnostics of urban shrinkage rests on foundations whose methodological scope is rather narrow. Usually, the decreasing number of permanent residents in cities is viewed as an indicator of depopulation. Thus, we disregard the diversity, dynamics, and complexity of processes taking place in urban spaces. We downplay the substance of urbanity, i.e. diverse uses of values offered by urban space of exchange. In diagnostic studies on depopulation and shrinking cities we need, no doubt, new definitions and new indicators to measure the observed phenomena.

With the above presented arguments in mind, we have assumed that:

- a **city is depopulating** when the number of its users, i.e., people benefiting from diverse values offered by urban space, is decreasing;
- a **city is shrinking**, when it loses some of its functions, i.e., when urban space of exchange gets restricted;
- a **city suffers from demographic and functional decline** when the day centre of life interest becomes significantly dispersed.

The term ‘day centre of life interest’ derives from solutions adopted in tax law. In legal regulations within this field we can come across the term ‘centre of economic interest’ which should be interpreted, above all, as family and social ties, political activism but also membership to associations or organisations. On the other hand, there are regulations concerning the centre of economic interest bound with professional activities, also with the movable and immovable property, bank accounts or financial instruments (Kaczmarek, Wilk 2014, p. 146). By placing an individual within a network of functional and spatial relationships framed by the above presented legal construct, we acquire foundations to perceive the centre of life interest as a meaningful idea for diagnostic purposes that may help to explain the phenomena of depopulation and shrinking cities. In the civil law doctrine, place of permanent residence (usually connected with the ownership of a house or a flat) and the place from which asset management decisions are taken are crucial for determining tax residence. Nevertheless, this legal fact does not ultimately prejudge about the location of everyday activities which determine the space-time scope of the centre of life interest. In addition to the place of permanent residence (formal administrative criterion) what counts are actual family, professional, educational, social, political, as well as cultural ties and everyday duties. However, in this context, the place of permanent residence is neither a necessary nor a sufficient condition for determining the everyday centre of life interest. The necessary and sufficient condition is to follow and register the above listed activities carried out in a given area together with the time spent on them. If these activities take place in the downtown district, far away from one’s domicile (outside administrative borders), we may conclude that the actual area of residence, i.e., the everyday centre of life interest is the area where urban space users actually carry out their activities. Obviously, this centre

may lie within the area of a shrinking and depopulating city in the meaning of the existing and criticised concepts. Urban space can also be used for most of the day by people formally residing outside of administrative borders of a given city. Hence, the idea of using permanent residence (registered in administrative documents) to assess the extent to which urban space is used throughout the day does not seem correct. With this knowledge in mind, depopulation and shrinking cities should be considered from the perspective of the actual residence, i.e., actual usage of urban space at a given moment. We should be speaking of a useful city, i.e. a city which is intensely used by different users. This allows maintaining dynamic spatial relations so typical of big cities. When the centre of life interest gets dispersed throughout the day, that is, most of the above-mentioned relations 'escape' downtown city areas, we can speak of depopulation and shrinking cities. In other cases, similar reasoning does not rest on convincing diagnostic foundations. As long as a city is used by people, who are not its permanent residents, suggesting depopulation is premature. The described space-time volatility of activities determines the actual place of residence, i.e., the centre of life interest. For the above stated reason, civil law doctrine helps in determining the factual place of residence. Activities that delineate the centre of life interest should be registered and examined in a holistic way. Epistemologically, the system approach is especially useful as, in addition to methodological merits, it allows formulating application-related indications. Determination of forms and intensity with which diverse urban spaces are used (their daily rhythm, size of flows, mobility dynamics of urban space users) lead to the idea of a useful city. It is urban space simply needed by its users. To many of them it is their actual (real) place of residence. Urban functions that can be found there are indispensable to lead normal life and attract people. If valuable functions are missing, the city falls in decline. To be able to realise that, it is not enough to use the permanent (formal) residence parameter. We need to measure and examine the centre of life interest to credibly reflect depopulation and shrinking city processes. Adopted assumptions bring us forward in formulating the idea of a useful city. It is based on identification of forms and on the intensity with which different urban spaces are used (rhythm, size, mobility, dynamics).

## **Epistemological context**

Science often seeks inspiration in arts. In the foreword to this paper, we already stressed the relevance of metaphor in social and economic geography and in spatial management. Walking across the pages of books may not only give us the pleasure of discovering author's way of thinking but often provides researchers with a stroke of genius. Quietly strolling through the lines of novels, focusing on the text, a researcher may suddenly discover the substance of his, sometimes idle, intellectual efforts. Suddenly, at the arm's length we see something which can be considered fulcrum of the world. In our considerations we have focused on aspects that attract the inhabitants of downtown areas to the suburbs and, simultaneous-

ly, push them out of the city centres. Undoubtedly, the power of attraction of the suburbs must be exceptional since so many inhabitants of downtown districts abandon them to experience the freedom and fresh air in the suburbs. This power, this charm of the suburbs was interestingly penetrated by Zbigniew Herbert:

“houses of suburb with sunken temples  
houses chewing bread crust  
cold as a paralytic’s dream  
whose stairs are a hotbed of dust  
houses constantly for sale  
motels of misery  
houses that have never been in the theatre”

Zbigniew Herbert, 2008, *Houses of the suburb*, [in:], *Pan Cogito*,  
Published by Wydawnictwo a5, Kraków; translated by Marta Ryciak

Landscape painted by the poet is unusually attractive, however, we are not sure to whom. Are inhabitants who escape from city centres attracted by advantages of suburban living? Perceptive, accurate insights about the suburbs of London an attentive reader will find in the novel “The Golden Notebook”: „You must admit he radiates an atmosphere of the suburbs. Odd. But they all do – I mean those tycoons, they all did. One could positively see the labour-saving devices and the kiddies all in their slumber-wear, coming down to kiss daddy good night. Bloody complacent swine they all are” (Lessing 2009, s. 84). We can also notice how individual components of urban space do not come together. Developers build houses (exceptionally willingly in the suburban zones of big cities), which do not get integrated into urban structures but remain islands in the archipelago of the monotony of around-urban landscape. Newly built houses, in particular the stand-alone ones, are anti-urban planning manifestations which deconstruct urban space. Every day, inhabitants of these exotic suburban islands travel to the centres of deserted cities. They continue using city centres as they need these urban spaces they have abandoned. Thus, the idea of a useful city refers to new thinking about urban layout. Contemporary urban ideas and empirical studies of urban structures focus primarily on building new houses and putting them into use but, at the same time, they ignore the integrated composition of urban space. In urban planning and when investigating green areas we usually deal with the so-called accountant’s approach replacing the city governor approach, which disappears and gradually loses importance. The layout of components (buildings, premises) is studied most frequently, but comprehensive analyses of urban spaces are omitted. System approach has lost its explanatory power although cities continue to be systems. What has changed are the profiles of constituent elements of urban structures and relations amongst them. Cities are still systems, even if researchers fail to notice the qualities of systemic urban processes. The above-quoted Herbert’s poem reveals research intuition; there is no systematic analysis of reality. As we have stressed already, poet’s intuition may not aspire to



being treated like scientific knowledge, but it may become epistemological inspiration. A thought emerges that nurtures scientific reflection over the significance of suburban and urban space and a researcher suddenly realises what question he would like to ask: why do people leave city centres and stay in them? (Kajdanek 2012). What is the reason behind such atavist human conduct, which gives many surprises to researchers and becomes the source of more or less justified theories of depopulation and shrinking cities? “If a city is to provide a functional and friendly environment to its residents, there is no other way to accomplish the goal than taking a systemic glimpse on how it is organised, structured and function-oriented” (Parysek 2015, p. 53).

## Systemic context

The statement that city is a complex system is not very much revealing. Already several dozen years ago proofs were available that system analysis may be useful to properly describe a city. However, recently we can observe the emergence of subsequent urban (sub)systems defined in social sciences as *urban life*: “Similarly to other complex social systems, a city builds and develops its own culture, the foundation of its identity, a part of external and internal image and an important condition of success or failure. There are diverse elements, starting from material products of urban culture, through norms of diverse power that regulate the performance of residents and users; a system of values that integrates urban community as such, but also environmental (collective) values of certain circles; moreover, a language and other systems of communication – to finish with elements of symbolic culture” (Karwińska 1992, p. 255–256). We should also remember about axiological approach to systems research in geography (Kostrowicki 1992) or interesting approaches to eco-urban systems (Rzeńca 2016). This is how the postmodern vision of the world and scientific research entered the systemic urban research where we are dealing with successive divisions, and the vision of the entire urban system is being pushed to the margins. Therefore, a comprehensive system approach in urban research should be restored. It is also a truism to say that the city, despite the observed changes, continues as a system whose characteristics evolve. Urban space and the way it is used are being transformed, but the logic of the urban system remains relatively stable. The urban system is being deconstructed, urbanity exceeds administrative borders of cities, but the sense of the system remains relatively stable. Therefore, system analysis is a valid approach to diagnose the phenomenon of depopulation and urban shrinkage. Knowledge about places of inhabitants’ residence tells us only how attributes are distributed in space, but omits flows, utility values, connections between elements, and mutual interactions, i.e. undoubtedly system-related properties. Recent years have witnessed a specific renaissance of interest in the functioning and development of a city as a ‘specific’ object in geographical, economic, social, and cultural space. Undoubtedly, we return to old concepts seen from a slightly different perspective (Regulski 1976). By emphasising the

complexity of the 'urban organism' we draw from the achievements of a number of scientific disciplines, including economy, urban planning, social and economic geography and spatial management, regional policy, sociology and many others to analyse the 'phenomenon' that is the city. In the light of contemporary processes affecting the functioning of cities, e.g. globalisation, diffusion of innovations, new concepts describing the essence of the city are emerging (e.g. recently an extremely popular idea of a 'smart city', etc.). Against this background, it may be interesting to return to the 'traditional' system approach, where the city is treated as a system and at the same time as a specific subsystem of a larger entity, namely the economy of a given country. The issue of precise delimitation and, consequently, identification of a city-system and its surroundings is not clear. In practice, it often happens that administrative boundaries may not reflect the actual range of the system-city impact. This is a natural, however, also an unfavourable, phenomenon, which hinders the description of the processes underpinning how a city functions and develops.

Let's start by recalling 'classical' definitions of the term 'system' which is crucial to our further considerations. For instance, according to Hall (1968, p. 9) a system is "...a set of objects together with relationships between those objects and their attributes. Attributes are properties of objects. Relationships tie parts of the system together." Bertalanffy (1981, p. 12) defines the system as a "...collection of elements that are linked to each other." In turn, Habr and Veprek (1976, p. 7) understand a system as a "...purposeful collection of elements and relationships between them, which together identify attributes of the entity."

As we can see, the above-quoted definitions are essentially the same. All of them assume that the existence of elements of the system, mutual relationships between them, and attributes that bind elements into a whole is the condition to having a system. These fundamental assumptions can be used further to analyse the attributes (properties) and interdependencies for any system. Using this well-established idea of the system approach we can – for our needs – use and adapt the system approach to analyse the functioning of a complex multi-dimensional dynamic structure that the city appears to be. First of all, we have to identify the main components of the urban system. We can distinguish the following subsystems: space users, development, power, and space. These components are bound with relations, which constitute the urban system. Looking at the second aspect of discovering the essence of systems operation, we need to highlight hierarchical links which allow identifying processes responsible for system control. In the systems theory, when systems develop and when we look at the concepts of how they operate, one component becomes central and performs control functions. According to the theory, each element of the system is at the same time a subsystem with a specific structure and properties. The emphasis applies equally to the city as a whole, as well as to each of its internal subsystems, which are at the same time elements of a larger system, such as a region or a country. The analysis of the 'users' subsystem should therefore cover all cultural and demographic processes, including the age, gender, occupational structure, labour resources, etc. The 'development' subsystem includes assets

together with functional structure, economic and social infrastructure, etc. The subsystem 'space' in the generally approved geographical sense comprises economic, physical-geographical, social, cultural, and political space.

Although the elements mentioned above are extremely diverse, the laws governing their mutual relationships are similar. Applying the principle of logical homology, we can assume that if an object is a system, it must exhibit the general characteristics of a system. This does not preclude the existence of extra-system attributes. Coming back to the issue at hand, for the individual elements to form a whole (in the sense of a system), they must be bound together. The set of these bonds provides the structure of the system, i.e., the city. Thus, the development of a city goes hand in hand with a number of interrelationships, which are precisely of a system nature. For the purposes of this study, we will give an example of such a bond. One of the more spectacular manifestations of the bonds occurring e.g. in the relationship between "users" and "space" is the formation and change in the city structure. It has a typical system-type bond character. The third main subsystem – "development" – also 'participates' in this process. In this case, space acts as a specific link. Spatial relations here perform a complementary, strengthening function and do not constitute the whole system, i.e. the city.

Since, according to the above-mentioned principle of logical homology, the city meets the criteria of being a system, let's identify selected attributes (features) of the system. One of the basic attributes of the system is its wholeness. A city-system will constitute a whole (in the sense of a system) if there is a rule that determines the states of its elements in relation to the environment, i.e., to a set of all objects that do not belong to the system. In other words, we must be able to delimit a given city-system, and a given "object" must have relations with its environment. Recalling Aristotle's well-known statement that "the whole is greater than the sum of its parts", it means that we cannot judge the functioning of the whole based only on knowledge about the functioning of its constituent elements. Let us therefore use an example from the field of science presented to illustrate this statement. The properties of a chemical compound are completely different from those of its elements, and different from properties of a mixture of these elements. A system is just such a "chemical compound" (not a mixture!), whose properties result from the fact that its constituent elements are bound with a certain specific type of relationship. It seems that against the background of previous deliberations, the "city" as a system exhibits very clear attributes of wholeness. This peculiar "phenomenon" that is the city, being a specific conglomerate of users, space and development, manifests unambiguously system-related properties. It is a typical "chemical compound" with features that cannot be derived from the properties of its elements alone. Each element of this system has a specific *modus operandi* which defines the relationships between the states of inputs and outputs. A system operation may change also when the bonds between elements change. The below presented theoretical conclusions are significant in practical terms for the analysis of interdependencies connected with the functioning of a city. This means, for example, that a change in the way one of the subsystems (e.g. the "power" subsystem) works modifies the nature of the links

with other subsystems. Consequently, according to the essence of the system, there is a change in the way the system-city works as a whole.

The openness of the system to the environment is a particularly important issue in system analysis. The degree of openness is therefore determined by whether the system contains boundary components, i.e. components which are not coupled with other elements, but at least one element is coupled with them. With our previous considerations in mind, this feature is of great practical value. It determines the relationship between the city and its surroundings, and thus facilitates the understanding of problems related to the functioning and control of city development. All of the distinguished subsystems contain boundary components, connecting them with another surrounding subsystem. For example, the population of a given city is a part of the population of a region, a country, and as a result of e.g. circular migration this relationship is particularly strong. In other words, the openness of the system means that no subsystem can be isolated in the city, i.e. not bound with any element, or having no element bound with it. Feedback is a special case of bond, which, by its very nature, is the basis of an important attribute of the system, which is homeostasis, i.e. the ability to maintain balance. This feature of openness of the city-system is important in economic and political practice. It is because of this feature that the scope of decisions made within a given system, whose effects do not affect the environment and other subsystems is negligible. On the other hand, many activities undertaken outside a given city-system cause reactions within it, as a result of the above-mentioned relationships. Economic reality provides a lot of evidence that this property was and, unfortunately still is, often disregarded or ignored. The issue of system openness connects with the concepts of balance, stability, sensitivity, and self-regulation.

Homeostasis, understood as the ability to maintain states of significant variables within certain limits is another feature of the city-system. The system, by its nature, gives the city a specific “resilience” to interferences from inside and outside of the system. It can eliminate the effects of destructive “shocks”, thus leaning towards stability. However, there are certain thresholds for the level of disintegrating stimulus, exceeding of which may destabilize the system. Such a phenomenon may occur when any element of the system is affected. The decisive role in this case is played by the strength of the disintegrating stimulus and the direction in which it acts. The system called a ‘city’ responds differently to the closure for traffic of, e.g., a small local district street and the main transit artery. An analogous relationship is likely to arise if a network device of technical infrastructure, etc. is disconnected.

The city, as a system, also exhibits a certain degree of adaptability, which is viewed as its important attribute. However, adaptability depends on the degree of system decentralisation. To explain this feature, we can again use the already presented examples. The more important an element from the point of view of the system is changed, the stronger the reaction will be and the more elements it will cover. Specifically, an amplified signal may “knock out” those subsystems, which are little resistant to a given stimulus. This situation threatens the function-

ing of the city-system as a whole. A special case is when the control subsystem “power” (!) becomes a destabilising factor. According to the principle of system hierarchy, any changes in the control subsystem have the greatest repercussions on other elements. This relationship is the effect of the role that the control subsystem plays in the process of a city-system functioning and development. An adaptive system such as a city can therefore maintain stability of all variables that are relevant to its operation within the limits necessary to maintain the coherence of the system. However, this attribute manifests itself when general stability criteria referred to above are met. Individual sub-systems of a city have a certain degree of independence. If a given change does not concern variables relevant to the structure of the system, it does not threaten the whole system. For example, the migration of a small number of people or consumption decisions of one family are not able to destabilise the city-system.

The city is also – without doubt – a dynamic and open system. When it operates and develops, its individual elements, as well as the nature of the links between them, evolve. In the context of these two features, system teleology seems very interesting. Three basic objectives of the system can be distinguished (Habr, Veprek 1976, p. 69): 1) to achieve a certain state or a sequence of states, where it concerns either the state of the system or the state of its surroundings or the relation between the state of the surroundings and the state of the system, 2) to achieve a specific structure of the system, 3) to achieve a specific system behaviour. Apparently, in the case of the city-system, we, first of all, aim at achieving the second goal, and then we aim to arrive at a given behaviour of the system. Of course, the hierarchy of goals is not insignificant, due to the level at which they have been set, the range of problems they cover and whether they are indirect or final. For example, the goal of the city-system can be: achieving the optimal state of the subsystems, stability and partial equilibria, and sustainable growth. The goal function does not have to be limited to measurable values, which is natural in socio-economic processes.

One of city-system attributes is also equifinality, i.e. the ability to achieve the same final state through different methods and from different starting states. This is at the same time one of the characteristics of open systems, which means that in practice there are many ways of achieving a given final goal. The choice of means and methods is therefore a separate issue. In theory, it is also assumed that equifinality is co-responsible for the ability to adjust. This, undoubtedly, relates to a system having mechanisms that stabilise and “mitigate” destructive stimuli. These mechanisms allow compensating for deviations and reactions that are incompatible with the purpose of the system. The described phenomenon may not always manifest itself directly in the city-system, but its symptoms are noticeable. It is understandable that this case will occur only if the limits of self-regulation/adjustment, i.e. the threshold of maximum system sensitivity, are not exceeded.

To sum up the presented considerations, we can conclude that the city is an overly complex, dynamic system, whose development is subordinated to systemic laws. The urban system is constituted by the space of circulation of people,

goods, capital, and information. In our opinion, analysing them based only on a mechanistic vision of processes would be incomplete or even erroneous. The study presents only selected system-related interdependencies that may exist in the city-system. We believe, however, that a conclusion from this part of considerations, perhaps too simple for methodologically advanced urban researchers, may read as follows: sources of many mechanisms and problems accompanying the functioning and development of cities may be sought in returning to the essence and methodology of system analysis. We would like to emphasize once again – in our concept the core of the sense of the city is movement and flows of people. Therefore, we have to take into account two contexts: a) the formal city life: residence, business activity, spatial management (visible in statistical records) and b) the real use of the city space including presence of temporary users of all types, who are not inhabitants, among them there are registered employees in all types of activities (identified on the basis of field research).

## Conclusion

Methodological system framework allows explaining the multiple worlds of participants in urban life. The city is, as it has been pointed out earlier, a complex synergic composition in which the creative layer is a dynamic space for exchange (Rewers 2014). In this new methodological context, system analysis should be treated as a rational and effective way of diagnosing the level of depopulation and shrinking of cities. Population censuses by place of residence (administrative and formal criterion) help only in determining the distribution of specific features in space. They disregard flows in the city space, utility values of exploited areas, connections between elements of urban structures, as well as their multiple impacts. The *systemic urban choreography* will be a way to efficiently use system analysis in effective research proceedings. The main structure of this concept has already been presented and discussed (Kaczmarek 2016). Using the metaphor of a dance one can describe the behaviour of tourists in urban space using measurable indicators. Taking into consideration the parameters describing a dance, such as: performers, path (line) of the motion, rhythm, pace, mood, emotions, steps, style, social conventions, scenery, atmosphere of the place, and audience one can select a few of them, which will describe and measure tourists' behaviour in urban space. We are going to develop this idea and check its usefulness in further research practice. To be able to accurately diagnose depopulation and urban shrinkage, it is necessary to show the variability with which urban space is used during the day. Movement, rhythm, and dynamics invariably remain the essence of urbanity (Parysek, Mierzejewska 2013). This will not be an easy task (Mydel 1993, p. 106), but it is worth returning and re-examining the old ideas of exploring the city (Majer 2014). As a result, we should develop effective methods of modelling urban space, especially in Polish cities. Re-visiting the already known and comprehensively described concepts can be an effective exercise. Taking a slightly different perspective at popular ideas, seeing them from a different

angle, helps in marking an unconventional horizon of understanding the world. In our opinion a key concept in understanding the phenomenon of shrinking cities is time geography (Matykowski 1990, May, Thrift 2003, Bul 2013, Ellegård 2019). However, this research trend is almost ignored in the current studies and literature on shrinking cities. Our concept presented here suggests that the systemic approach might lead to the synthesis of the time geography analysis and the urban shrinkage process. We believe that it will constitute the beginning of a discussion on explaining the variability of urban space on different scales, ranging from the scale of everyday life to global, long-term trends, visible in contemporary urban life.

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## **Idea miasta użytecznego, czyli prawda o wyludnianiu i kurczeniu się miast w kontekście systemowym**

**Zarys treści:** W ostatnich latach obserwuje się zjawisko wyludniania i kurczenia się miast. Depopulacja dużych miast jest bez wątpienia faktem demograficznym. Proces depopulacji miast stał się podstawą licznych raportów i alarmistycznych prac badawczych. Można jednak stwierdzić, że podstawy diagnostyczne wspomnianego zjawiska mają zawężony fundament metodyczny. Jako miarę depopulacji przyjmuje się zazwyczaj liczbę stałych mieszkańców (według miejsca zamieszkania). W ten sposób pomija się różnorodność, złożoność i dynamikę procesów zachodzących we współczesnych miastach. Postmodernistyczna rzeczywistość jawi się jako posegregowany, separowany świat. Należy zatem poddać pod dyskusję stosowane podejścia diagnostyczne. Idąc dalej, można uznać, że pomiar wyludniania i kurczenia się miast według liczby stałych mieszkańców jest uproszczony, ponieważ ignoruje istotę miejskości, czyli różnorodność walorów miejskiej przestrzeni wymiany (ich wartość użytkową). Idee zawarte w artykule powinny wywołać krytyczną dyskusję w gronie badaczy zajmujących się kwestiami miast. Zdaniem autorów grzechem współczesnej geografii społeczno-ekonomicznej i gospodarki przestrzennej jest sprowadzanie wielkich spraw człowieka do zagadnień poprawnej reprezentatywności.

**Słowa kluczowe:** miasto, depopulacja, system, centrum interesu życiowego, użyteczność