A Place of Sustainable Development in Contemporary Urban Concepts

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Abstract. The concept of sustainable development has promoted around the world for years by taking action to implement it on a global scale. Hence, as a development paradigm, it appears in many strategic documents at every planning level. The main goal of the research is to determine whether and to what extent the idea of sustainable development manifests itself in the contemporary urban concepts. The analysis covered publications, events and selected urban projects. As the beginning of the time frame, the 1960s were adopted, which together with the 1970s are the background to the changes that led to the crystallization of the idea of sustainable development. This is a period of decline and criticism of the idea of modernism, the crisis of cities, as well as the beginnings of the trend of postmodernism. The following years - the 80s, 90s and the beginnings of the 21st century - is a gradual development of the concept: a compact city, a green city, an intelligent city, as well as searching for ways to implement sustainable development in cities. The analysis of the contemporary concepts of shaping cities has shown a lack of consistent, uniform planning and urban planning criteria for sustainable development. However, this does not necessarily mean the faults of the idea itself, but the advantage of an individual approach to each city and the possibility of its flexible implementation. The conducted analysis also showed that particular contemporary concepts are based on similar assumptions, or even are opposed to each other. None of them offers the perfect city. Individual ideas of urban development can be implemented separately or creatively combined with each other. Although none of the ideas of shaping cities is fully complete and universal, it is important to treat the city as one organism, and seeking for its sustainability, consistently use selected planning tools, adapting ideas to the context and scale of the city. Further search for the right direction of urban development is a task that in a given time perspective may lead to an improvement in the spatial, social, economic and environmental situation, and consequently to a higher quality of life for the residents.

1. Introduction

The contemporary structure of cities is to some extent the result of the influence of all urban concepts (except for theoretical ones). The scope of the research was limited to the selected urban concepts of the second half of the 20th century and the beginning of the 21st century, in order to find references to the sustainable development in them. The period of decline and criticism of the idea of modernism, the crisis of cities, the beginnings of postmodernism has been taken into account, as well as the gradual development of the concept of a compact city, a green city, a smart city, and seeking ways to implement sustainable development. Although the subjective choice and recalling only some of the urban concepts, as well as publications, events and urban realizations is a certain simplification, it was...
attempted to choose those that made a significant contribution to today's understanding of a sustainable city. As history shows, usually, new concepts of shaping the spatial structure of cities result from the criticism of earlier theories and from the pursuit of the ideal city - although each time this ideal is understood differently, similarly with the sustainable development. Although the idea of sustainable development has been functioning for years, it lacks specificity and uniformity.

2. Sustainable development in theory
Sustainable development has a distant genesis. For years it has been propagated in the world, taking actions to implement it on a global scale. As the main rule of development, it appears in strategic documents at practically every level of planning and begins to have an operational character at various levels of management and in various fields. However, it still lacks concretization and holistic understanding [1].

The theory of sustainable development is related to spatial policy that takes into account primarily the criteria of efficiency, quality and equality. Consequently, it concerns all the ecological, economic, spatial and social aspects. And in these planes shapes the city - its form, way of functioning, and even its inhabitants. Sustainable development in the first, basic association is understood as rational resource management. In the context of a city, it means: space, resources, energy, people and even time. Referring the question of sustainable development only to cities, one can say that it is “that all resources should be used optimally for synergistic development, in which social, environmental and economic aspects are mutually reinforcing in the city space” [2].

In literature, one can sometimes find the argument that sustainable development is a contradiction in itself because: firstly, development is the opposite of equilibrium, and secondly, it is the imbalance that is the natural state and omnipresent in nature. Therefore, it is often proposed to replace the term sustainable development with balancing the development, permanent development or descriptive terms [1-5].

3. 1960s and 1970s - criticism of modernism
Numerous negative phenomena that have occurred in cities over the last few decades resulted, among others, from neglect, lack of resources or inaction, which should serve to repair and adjust space to changing conditions. The growing economic, social and, consequently, urban crisis caused in 1967 in the US a few days of bloody riots on the streets of Detroit, Newark, Cambridge, Milwaukee and others due to, inter alia: racial discrimination, Vietnam war, racial segregation and growing dissatisfaction with the living conditions in the districts - ghettos. The Detroit riots are a symbol of the American urban crisis of the 1960s and 1970s.

Significant changes in the approach to the issue of the city were initiated by Jane Jacobs in 1961. In the introduction to the book *The Death and Life of Great American Cities* [6], she asked the question: what kind of problem is the city? It was a turning point in the theory of shaping cities in the 20th century. In his criticism of the planning tenets of modernism, Jacobs stated that they had a destructive impact on cities and on societies characterized by layered complexity and only apparent chaos. She considered the most negative: the renewal of cities in the spirit of modernism, the separation of urban functions, resulting in the creation of unnatural, isolated and inhumane urban spaces and the lack of traditional streets, stimulating natural social contacts. Therefore, Jacobs recommended the generation of diversity by: mixing the land use that allows it to be used at different times of the day, short blocks to facilitate pedestrian communication, architectural objects of different ages and condition, increased density of buildings. It can be said that Jacobs' demands of 1961 coincide with modern priorities of sustainable development, i.e. the mixing of functions, appropriate density of buildings, reduction of transport needs and raising the rank of the neighborhood [7].
In the 1960s, Kevin Lynch, an American urban planner, also expressed similar opposition to the principles of modernism in urban planning [8]. He investigated the issue of the perception of the city by its inhabitants. He stated that modernist urbanism and architecture deprive the inhabitants of the characteristic reference points in the city and negatively affect its reception. In addition, Lynch has developed a look at the city as an integrated system that should characterize: vitality, sense, fit, access, efficiency, control and justice [9]. Also in this approach, you can see some analogies to the paradigm of sustainable development. Important publications from this period, criticizing the state of urban spaces and setting new trends in urban planning, can also include: Gruen V. *The heart of our cities; the urban crisis: diagnosis and cure* [10], Babcock R.F. *The zoning game; municipal practices and policies* [11]; McHarg I.L. *Design with nature* [12]. In the '70s on the transformation of urban spaces, among others, wrote: M. Castells - *La question urbaine* [13], H. Lefebvre - *La production de l'espace* [14], L. Krier , R. Krier , et al. - *La reconstruction de la ville européenne* [15] and R. Krier - *Stadtraum in Theorie und Praxis* [16]. In this last book, Krier criticizes the reconstruction of the destroyed urban structures and suggests the reconstruction of traditional spatial compositions of cities. All of these publications in varying degrees and in different planes refer to the concept of sustainable development.

Among the interesting realizations from the 1960s, the city of Sun City (Arizona, USA) deserves special attention to the retirement community (1960), the construction of the city of Reston in Virginia in the USA (1964) by Robert E. Simon and the beginning in 1967. building from scratch the city of Milton Keynes (UK) to reduce population density and relieve London, Birmingham, Oxford and Leicester. Although Reston came into existence before the rise of the New Urbanism trend, it can be said that in many respects it was part of this trend and fulfilled its assumptions. In turn, Milton Keynes was based on the concept of a garden city with a rectangular grid of streets, green belts and the initial assumption that “the highest building will not be taller than the highest tree”. In the 1970s, however, the construction of Almere - a Dutch urban-social experiment was begun, which currently has nearly 200,000 inhabitants and which is the youngest, constantly developing city of the Netherlands. But the global success was achieved by the Brazilian city of Curitiba, in which the beginning of changes was initiated in 1971 by the mayor Jaime Lerner - architect and urban planner. Among other things, he introduced the system of integrated public transport - one of the most innovative in the world due to its efficiency, quality and low price. This system has become a model among others for Seoul and Los Angeles, as well as eighty other cities. Curitiba is now considered one of the best examples of a compact, sustainable and ecological city. In 2017, it was included in the UN list of the best world examples of urban planning, apart from Copenhagen and Stockholm.

### 4. 1980s and 1990s - New Urbanism

A significant contribution to contemporary theories of shaping cities has been brought by the New Urbanism trend, which was born in the USA in the 1980s and then took root in European urban planning, including thanks to the activities of the Luxembourg architect and town planner Léon Krier. The New Urbanism promotes, above all, a return to the traditional, historical, quarterly composition of cities, in which the central role plays: the central city square, the lack of suburban area, the cohesion of the city layout and the marginalization of car traffic for cycling and walking. Among the postulates of the New Urbanism, the following should also be mentioned: diversification of functions and social groups in districts, creating well-connected public spaces (pedestrian, public and car communication) embedded in local identity, creating “local neighborhood communities with a friendly urban, economic, social and social environment, natural environment, where a sense of the local community is created” [2]. In 1996, in the *Congress for the New Urbanism* in Charleston (USA), the urban planning guidelines were written in the form of the *New Urban Planning Charter*, combining social, environmental, spatial and functional aspects.
In the 1980s and 1990s, many interesting publications were published about postmodernism, New Urbanism, as well as ways to improve the condition of cities and their public spaces. These include: Whyte W.H. *The Social Life of Small Urban Spaces* [17], Friedman Y. *A better life in towns: campaign for the renaissance of cities* [18], Lynch K. *A Theory of Good City Form* [9], Fishman R. *Bourgeois Utopias: the rise and fall of suburbia* [19], Harvey D. *The Condition of Post-Modernity* [20], Sassen S. *The Global City: New York, London, Tokyo* [21] (the term “Global City” was introduced for the first time), Jencks Ch. *Post-Modern Triumphs in London* [22]. The 1987 report of WCED (World Commission on Environment and Development), *Our Common Future*, is considered a milestone in thinking about sustainable development [23], commonly known as “Brundtland Report”. In 1992, the First Earth Summit in Rio de Janeiro took place. It adopted “Agenda 21” and “Rio Declaration on Environment and Development”.

Interesting examples of building towns from scratch, according to the New Urbanism principles, are similar: Poundbury and the Polish settlement Siewierz Jeziorna. The initiator of the creation of Poundbury (UK) was the British Prince Charles. The village has been built in stages since 1993 on the basis of Léon Krier's plans from the 1980s. In addition to the urban layout, the characteristic feature of Poundbury is the use of traditional English buildings. Currently, there are 2,500 inhabitants, and eventually, there will be about 6,000. In turn, the Siewierz-Jeziorna housing estate is being built on the area of 120 ha according to the design of the Mycielski Architecture & Urbanism design studio (MAU). Currently, the first stage is being implemented. The project takes into account the principles of New Urban Planning, and thus sustainable development. Many environmental solutions have been applied, including heat pumps and rainwater tanks etc. The New Urbanism movement from the 1980s was intensively promoted by Elizabeth Plater-Zyberk and Andrés Duany, who in 1980 designed and started the construction of the city of Seaside (Florida, USA) - one of the first cities in the New Urbanism in the USA. Elizabeth Plater-Zyberk and Andrés Duany, the founders of the company Duany Plater-Zyberk & Company (DPZ), dealt with the study and design of urban spaces in accordance with the ideas of new urban planning. A conclusive record of these ideas and the way of shaping the built environment is well illustrated by their original model code, i.e. *Smart Code* and a cross-section model called *Transect*. In both cases, the basis is parametric zoning, based on three priorities: building densities, mixing of functions and dimensions of buildings appropriate to the zone of occurrence [2]. *Transect* as a component of *Smart Code* is, according to the New Urbanism, a proposal of good urban planning principles. It was created as an analytical and planning tool, useful in determining: layout, form and dimensions of buildings, nature of the landscape, urban functions and density of buildings, and even the width of streets, parking, urban details, species of urban green trees, etc. And although the zone diagram was created on the basis of American urban planning, after appropriate modification, its methodology was also applied to the structure of European cities. This is possible because almost every city is organized in a way that ensures a natural urban gradient [1].

In the 1990s, Rob Krier and Christoph Kohl created the master plan of Kirchsteigfeld - a new district of Potsdam (Germany), with an area of 60 hectares for 4,900 inhabitants. This district is currently ranked among the most important developments in the eastern part of Germany. And is an example of applying the idea of sustainable development. Similarly to Hammarby Sjöstad (1997) - the district of Stockholm (Sweden) also called Hammarby Lake City, which was transformed from an industrial area into a modern, sustainable residential and service district for around 26,000 people, ecological and urban solutions adopted for Hammarby Sjöstad became a model for several similar districts in Europe and Asia.

5. 21st century concepts
The issues of shaping contemporary, sustainable cities were also addressed by the European Council of Town Planners, which in 2003 published in Lisbon the document *New Athens Charter: Vision of
21st century cities. It reflected the changes that have occurred in the planning of cities during the last decades of the 20th century. According to the New Athens Charter, this is a vision of a network of cities that:

- they maintain the richness and cultural diversity resulting from their long history and skillfully combine their present and future with the past;
- they are connected in networks of multiple meanings and functions;
- they are creative and competitive, but at the same time they are able to cooperate;
- they contribute decisively to the well-being and comfortable life of their inhabitants;
- harmoniously connect the urbanized environment with the natural environment.

Another document related to sustainable development and being part of the trend of new urban planning is the Leipzig Charter for Sustainable European Cities Development at the meeting of ministers of European Union Member States responsible for urban development in Leipzig in 2007. The Charter contains common principles and strategies urban development policy, such as:

- maintaining a compact settlement structure as an important basis for effective and sustainable use of resources, creating and providing high quality public spaces, improving the quality of life of residents, modernization of infrastructure networks and improvement of energy efficiency, adaptation to threats resulting from climate change, active innovation and education policy, special attention to the poorest districts in the context of the city as a whole, implementation of environmental improvement strategies, strengthening the local economy and local labor market policy, as well as promoting efficient city transport. Leipzig Charter, like the Tractate of Lisbon (2007 - concerning, among others, climate change, security and sustainable development), Declaration from Marseilles (2008 - mainly about the Union for the Mediterranean, including sustainable development) and Declaration from Toledo (2010 - devoted to the strategy of European cities development), they were key international documents, binding sustainability with the development of cities.

Another example of a comprehensive approach to the issues of shaping the city, referring to sustainable development, is the concept of Green Urbanism, which Steffen Lehmann [24] formulated in three complex aspects: planning and communication, biodiversity and water, materials and energy. On the basis of the interaction between these aspects, Lehmann distinguished fifteen principles that give an integrated framework of Green Urbanism and serve this way of shaping cities. Green Urbanism is interdisciplinary, hence requires the cooperation of landscape architects, urban planners, environmentalists, transport specialists, physicists, engineers, sociologists, economists and others. According to Lehmann, this is a much more important process than creating compact, multi-purpose, intelligent cities, etc.

Another idea of urban development that fits into sustainable development is Smart City, which is an intelligent city. It is a city in which broadly understood modern technologies are used to improve the quality of life of residents and for better functioning of the city as a whole. It operates in a smart economy, based on close cooperation between enterprises, to optimize the exchange of resources, energy and products, but also waste. This aspect is very important in the concept of a smart city, which should be as balanced as possible, self-sufficient and close to a closed circuit. In the literature, the term Smart City is usually assigned the equivalent of “intelligent city”. Such a translation is a big simplification. SMART should be understood as an acronym: S – simple, specific, M – measurable, manageable, A – achievable, ambitious, available, R – reasonable, relevant, realistic, T – timely defined, timeable, tangible [25]. Thus, it is not only about garbage processing, but about skillfully using local possibilities, such as, for example, production of energy and fuels from waste, the use of waste heat from the industry for housing heating, collection and reuse of rainwater and gray, etc. Smart City is also low-emission communication infrastructure, intelligent traffic management, technologies enabling searching for transport connections, routes and parking spaces. In urban space, it also means, among others: streets and zones excluded from vehicular traffic, safe, monitored public
spaces, effective street lighting. One of the cities that most fully implement the idea of Smart Cities is Vienna. It is one of the best cities in the world in terms of offered living conditions. An example of innovative solutions introduced in this city are the thermal tunnels of new metro sections, which are covered with energy storage materials, then distributed with special installations for buildings in the neighborhood. In turn, Amsterdam is very actively testing and implementing intelligent solutions that improve the functioning of urban spaces. Currently, many projects are being implemented in it, which are part of the Amsterdam Smart City venture. Another example of a smart city is Singapore. The city has one of the most technologically advanced energy and water management systems, including solar systems in public spaces and collection of rainwater, processing of gray water and desalination of sea waters. In addition, Singapore is equipped with a very well-functioning, intelligent transport system that effectively reduces traffic in the city [1].

A lot of publications have been created on Smart Cities. Among others Duany A., Speck J., Lydon M. wrote The Smart Growth Manual [26], Komninos N. Intelligent Cities and Globalisation of Innovation Networks [27], James P. Urban sustainability in theory and practice. Circles of sustainability [28]. In addition to interesting and successful implementations from this period, we should mention those that, although created from scratch, and on the basis of the right ideas, ended in failure. The first example is Masdar (United Arab Emirates) - a city with a completely ecological foundation, whose construction was started in 2006 according to the design of Norman Foster (Foster & Partners). Currently, this experiment is considered unsuccessful, and the city is largely a ghost city. Other examples of ghost cities can be found in China, where in the twenty-first century several dozen cities were built from several hundred thousand people each, with interesting urban composition and architecture, designed by design studios from around the world, in reference to the idea of sustainable development, yet overestimated in terms of social and practically empty (eg Ordos, Zhengdong, Tianducheng, Nanhui New City, etc.).

6. Results and discussions
Sustainable development has a distant genesis, but it was commonplace in the 1980s. Since the early 1990s, the implementation processes have been carried out at various levels of spatial policy. Although the sustainable development is widely recognized as a paradigm for the development of 21st century cities, as demonstrated by the analysis, there is no single widely used model of a sustainable city. This is partly due to the fact that the sustainable development should be understood as a changeable rather than a final state. It is also related to the dynamics of processes that constantly occur in the integrated structure of cities, where the disruption of the balance of one of the components entails the disturbance of the order of the others. Balancing development is, therefore, a continuous process of responding to changes taking place and striving to improve the quality of the urban environment and the quality of life of its inhabitants.

From the environmental aspects, and more specifically from the vision of urban planning based on ecology (Ekopolis) and related to new technologies, there are two concepts - Compact City and Green City - largely contradictory. In a compact city, the most important is the efficient development of space, including inter alia, development inward, stopping suburbanization, revitalization, as well as the sustainable transport. On the other hand, the green city is characterized by the focus on environmental issues, including: the optimization of the circuits of matter and energy and, above all, the development of the system of biologically active areas and open areas, which is why the green city promotes urban dispersed structure. A separate group of concepts are those for which the starting point is primarily the improvement of people's quality of life. Here we can mention the aforementioned Smart City, but also concepts based on more point-like activities such as "everyday urbanism" and Ditch Urbanism. In this set, especially smart cities are associated with integrated activities in several thematic areas and are focused on using the latest technological achievements for effective management in these areas.
Despite the differences between the selected concepts discussed, and their focus on selected problems, each of them proposes the development of the city in some aspect of the sustainable development.

7. Conclusions
As it was already mentioned, the analysis of contemporary concepts of shaping the cities has shown the lack of consistent, uniform planning and urban planning criteria for sustainable development. However, this does not necessarily mean the faults of the idea itself, but the advantage of an individual approach to each city and the possibility of its flexible implementation. The conducted analysis also showed that the particular contemporary concepts are based on similar assumptions, or even are opposed to each other. None of them offers the perfect city. For example, the trend of New Urbanism, although it has many positive assumptions and is closely related to the sustainable development, is criticized today for promoting too traditional urban layouts, corresponding only to the traditional residential models.

Individual ideas of urban development can be implemented separately or creatively combined with each other. Integration of the concept may lead to the creation of a compact city, accessible on foot and by bicycle, with a proper communication and nature system, equipped with modern technological achievements. The inclusion of some urban code guidelines (Smart Code) in this layout would ensure obtaining a clear spatial structure of urban units with diversified forms of building and functions, equipped with well-designed public spaces and economically using technical infrastructure. Although none of the ideas of shaping cities is fully complete and universal, it is important to treat the city as one organism, and seeking for its sustainability, consistently use selected planning tools, adapting ideas to the context and scale of the city.

In turn, the diversity of the examples of publications, events and implementation of urban concepts from the last fifty years shows the background of the changes taking place. It also provides both the capacity of the concept of sustainable development and a wide range of activities that can be undertaken on its behalf.

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