The aim of this article is to present the multidimensional phenomenon of urban sprawl in relation to the concept of the compact city and spatial policy. Intensive urbanization, which leads to spatial, social, environmental and cultural changes, has been observed in Polish cities and peri-urban areas for many years. The authors distinguish between the negative aspects of urban sprawl and the positive implications of the compact city. Spatial planning should be considered as a tool to manage urban and rural areas. In Poland the spatial planning system consists of three levels: national, regional, and local. It is assumed that spatial policy that contributes to improving cities according to the concept of the compact city can lead to a formation of sustainable urban structure in which society, economy, nature and cultural heritage harmoniously coexist. The case study of Nowe Zerniki estate in Wroclaw is analyzed. Nowe Zerniki exemplifies the concept of the compact city and the brownfield investment ideas that can contribute to the transformation into a sustainable city. It also provides a model for creating modern urban development in accordance with the current architectural, urban, environmental and social requirements.

Keywords: city, peri-urban area, urban sprawl, compact city, spatial policy, brownfield

INTRODUCTION

Intensive demographic changes imply a dynamic development of cities and suburban areas, both in terms of quality and quantity. Development often takes place in a chaotic manner and is associated with a process referred to in the literature as urban sprawl. According to Litwinska (2010) urban sprawl can be defined as the uncontrolled expansion of big cities, around which arise heterogeneous suburbia located in opposition to the compact city concept, which might be perceived as more sustainable. The phenomenon of urban sprawl was first observed in the
United States of America as early as the 1920s, in Europe in the 1970s and in Poland during the transformation of the 1990s. Investment pressure in suburban areas is caused mainly by:

- running out of investment areas in cities,
- investors’ reluctance to invest in brownfield projects,
- liberal spatial policies set by suburban municipalities compared to the often restrictive conditions in cities,
- lower rent,
- growing demand for owning a home in a natural setting

Transformation of suburban areas in the context of sprawl and transformation of cities in relation to the concept of the compact city should be analyzed in several dimensions: social, functional, economic and environmental, as they are multidirectional phenomena which combine all aspects of human activity.

The aim of this article is therefore to analyze and evaluate the phenomenon of urban sprawl in opposition to the concept of the compact city with regard to urban planning regulations. The authors juxtapose two opposing ideas and seek to answer the following questions: Is the concept of the compact city a better way to hinder urban sprawl? Is planning, as a key element of spatial policy, the right tool to create and manage “high quality space”? What is the role of municipal authorities in the management of the city? In the case study part of this paper these issues are related to the Nowe Zerniki estate in Wroclaw, Poland.

The desk research was based on an analysis of existing materials such as the local master plan for the area of the northern section of the Targowa route in Wroclaw (Act No. XXXI / 703/12 Wroclaw City Council of 13 September 2012), urban planning documents of the city of Wroclaw and other strategic and planning documents. The authors also used these indicators: the share of the area covered by the local master plans in Poland between 2009 and 2012 and net migration of inhabitants per 1,000 people between 2009 and 2012.

MULTIDIMENSIONAL CHARACTER OF URBAN SPRAWL VS. THE COMPACT CITY CONCEPT

According to Litwinska (2010) urban sprawl (in Europe known as Eurosprawl) may be affected by a number of factors: a surge in road transport, changes in patterns of housing and the growing trend of possessing a detached house with a garden, location of industrial sites in the outskirts, and progressive changes in agriculture (including reduction of available arable land, greater intensification of agricultural production, and multifunctional character of agricultural land use). Other important triggers facilitating urban sprawl are often too general and laconic regulations of local master plans that allow investors a lot of freedom in locating their businesses. Too liberal spatial policy in peri-urban communities leads to spatial chaos. According to Milewska-Osiecka (2010) there are no clear rules to be followed in designing new spaces, which results in architecture referred to as modern eclecticism. In this situation
ready-made home design projects serve as a quick and economically viable solution, but they often have nothing to do with the cultural heritage and tradition of the place where the new facility construction arises. That leads to similar looking architectural constructions which decrease landscape quality (Syrkus 1976; Wesołowska 2010). Thus it has been concluded that the mismanagement of spatial development causes disintegration, dysfunction and socio-economic and spatial disorientation (Słodczyk 2001; Kozłowski 2005; Domanski 2007). Urban sprawl also implies economic problems related to the construction and maintenance expenditures for infrastructure. Moreover, it is important to draw attention to the increasing costs associated with transport, as the primary means of transportation for the suburbs is a car. Cities become depopulated and their investment attractiveness is reduced.

Despite the obvious spatial effects, urban sprawl also affects the social structure. Construction of a detached house may be perceived as a manifestation of independence for those who can afford it. Possessing such an estate is according to Randall (1981) and Smith (1981) a component of the social welfare function. According to the research results of Szymanska and Bieganski (2011) the number of people who live in municipalities surrounding a city in Poland increased from 14.562 million in 1999 to 14.889 million in 2009.

Suburbanization, the development of suburban areas where the dominant element is single-family housing, implies a lot of social and sociological problems. The most important ones are the breakdown of family bonds and a decrease in the intensity of relationships, as well as limited access to high quality services. There are difficulties in maintaining a well-balanced life, meaning the harmony of family life, work and the maintenance of friends (Słodczyk and Szafranek 2006; Karwinska 2011). Another problem is potential conflict between the typical urban and rural lifestyles of the original and newly arriving residents of suburbs. As a result, conflicts of different natures may arise between users of the site: temporal (old and new), stratification (rich and poor), and spatial (old housing and new housing) (Handcuffs 2009). Many authors, including Waldsey and Lewis (1986) expressed the belief that the heterogeneity of the social structure (i.e. mosaic culture) seems to be a good guarantee of proper human relationships, especially in peri-urban areas.

Another perspective on urban sprawl regards issues related to the life-cycle and its impact on different forms of housing estates. This process is referred to in the literature as residential mobility, and is associated with dichotomous division between those who move frequently (movers) and for those who stay in one place over a long period of time (stayers). American geographers have shown that during that cycle events occur that cause an increase or decrease in readiness for migration (Berry 1973). In addition, residential decisions are influenced by income, social status, construction and architectural trends, and individual situations.

Social issues related to the analyzed phenomenon are important, but the most spectacular outcome of urban sprawl is the spatial transformation. It should be emphasized, however, that no less significant is the environmental impact of urban sprawl. The environment should be considered as a crucial component in spatial and social organizational systems. Urban sprawl disturbs ecological balance and increases unsustainable environmental resource management. Moreover, heavy human pressure on the environment, is caused, especially in suburban areas, by the disadvantageous use of greenfield for construction. Overly intense construction
activity leads to damaging changes in the environment such as change of morphology of the terrain, distortion of hydrological conditions, and biodiversity loss (Jakubczyk-Gryszkiewicz 2009). The overall conclusion is that the phenomenon of urban sprawl is negative because it adversely affects the social, spatial and environmental aspects.

In this paper the authors contrast urban sprawl with the concept of the compact city, which refers to the principles of sustainable development defined in Gro Harlem Brundtland’s report “Our Common Future” from 1987. The compact city concept is related to smart growth and sustainable urban planning (Polit 2010). What, in fact, is a compact city? It is a city that is designed to fulfill the needs and expectations of its inhabitants, ensure the harmonious development of society and minimize the risk that future generations will not be able to satisfy their needs. In order to find a city a compact city, it must follow basic guidelines. The most important ones include dense housing development (plot ratio) that enables the provision of accommodation to all residents of the city and ensure the least possible sprawl. Further, more, the cost of infrastructure in the compact city is lower due to shorter distances (Kusinska 2007; Sylwestrzak 2009). Dense housing development in a city enforces a compact transportation system that is efficient, economical and convenient. An important element of such a system is the use of integrated public transport, one element of which is high quality bicycle and pedestrian routes. In the compact city there is also place for greenery and public spaces. In order to make a city more sustainable while being compact it is necessary to create green infrastructure with high aesthetic and functional values, or even landscape ecological sequences. Such sequences may take a form of green rings, thus ensuring the ecological and functional continuity of green areas (Żarska 2006). Also important in the compact city is the combination and provision of different functions like housing, services and recreation to each of the residents in order to provide optimal access to basic services that the city offers. The compact city should also ensure city center revitalization and other city zone improvements (Tolbooth 2011). The compact city has clear boundaries and is easily definable in the landscape, which should be considered as value-added.

Having said that, the concept of the compact city is based on the principle of decreasing land taken by urbanized land cover. The concept favors re-use of brownfield sites or recycling space rather than locating industrial investments outside the city, namely transforming agricultural areas (Jenks, Burton and Williams 1996). Brownfield investments should constitute the crucial element of urban spatial policy. They do not require large infrastructural investment and enable faster business establishment which from an economic point of view is feasible (Domanski 2009).

MASTER PLANNING AS A MAIN ELEMENT OF SPATIAL POLICY – THE CASE STUDY OF NOWE ZERNIKI, WROCLAW, POLAND

Consistent and rational spatial policy is the tool that helps to prevent urban sprawl processes and enables the development of cities in accordance with the guidelines of the compact city concept. The main policy instrument is spatial planning, which in Poland happens on several
levels. Since the administrative reform in 1999 in Poland there have been four levels of public authority. The distribution of responsibilities in relation to spatial policy breaks down as:

- the Council of Ministers is responsible for spatial policy of the country by creating the concept of spatial development of the country,
- voivodship governments lead and create spatial policy in the voivodships by designing spatial development plans,
- county councils carry out analyses and studies in the field of spatial planning,
- municipal governments prepare the study of conditions and directions of spatial planning (obligatorily) and local master plans (non-obligatorily).

The Act of 27 March 2003 on Spatial Planning and Development (Dz.U. 2003 No. 80, item 717) specifies the competences of each authority. This document is a set of rules on how to create spatial policy. It defines how to deal with the allocation of land for specific functions, and to determine the rules of their development and building construction (Borsa 2010). The act also states that the most important document in the field of spatial planning is the local master plan, which is an act of local law. Moreover, the master plan is not only the document that sets socio-economic relations in a municipality, but it is also an essential tool for the independence of the local government. Therefore, the master plan is the most effective and the most appropriate instrument to facilitate spatial policy at the micro level (Domanski 2002). The master plan includes sets of guidelines for investors, such as type and function of the building, esthetics, and architectural and construction requirements. Thus it takes a dominant role in creating spatial development.

There are several types of local master plans, depending on their role. The most common are those that have investment character. Their main role is to facilitate dynamic economic development. Another type is the protective master plan, which, unfortunately, is practically not in use due to the high procedural costs and low returns on investment. The last group consists of plans which are for general arrangements, and given the state of Polish spatial development they will soon be the main challenge for urban planners.

The primary objective of planning, according to Chojnicki (1992) and Parysek (2001), is to achieve a sustainable and acceptable spatial organization, i.e. territorial organization and structure of a social system that matches the basic criteria of social rationality. These criteria are of functional characteristics since they correspond to certain social values and aspirations. These criteria involve many different aspects of social life, including political, economic, technical, technological, cultural, ecological, aesthetic and ethical ones (Parysek 2001: 203). Having said that, the master plan is a legal representation of such a model.

Wroclaw authorities, being aware of the problems associated with urban sprawl and seeing opportunities for sustainable urban development in line with the compact city concept, have been pursuing a consistent spatial policy for years. The total area of the city was covered by master plans by more than 50% in 2012, which was higher than the average for other cities in Poland (around 46%) (Fig. 1). The average share of the total area covered by the local master plans in Poland and in rural communities was 28 percent in 2012.
More than half of the city has valid master plans and this trend has been growing since 2009, which puts Wroclaw in a very good place relative to the whole country and other cities. As well, the City Council adopted a new study of conditions and directions of spatial planning in Wroclaw on 20 May 2010 (Act No. L / 1467/10) by which the city gained an updated and improved document that puts forward a renewed spatial policy of the municipality. The study covers the entire city area, making it comprehensive and diagnostic (Niewiadomski 2003).

These documents are particularly important today when Wroclaw faces a number of socio-demographic and spatial problems, namely suburbanization processes. Net migration in Wroclaw was about 0.8 persons per 1,000 people (average of 2009–2012), while in the peri-urban municipalities near Wroclaw – those in which we observe urban sprawl – it was about 20 persons per 1,000 people (average of 2009–2012). The average values for urban and rural municipalities in 2009–2012 represent respectively: −2 and 2.5 persons per 1,000 people. That proves the noticeable trend of migration from the cities to the countryside (Fig. 2). The most common reason for these migrations is to purchase a house in a suburban area.

Suburbs in Poland develop mostly as residential housing areas. This process also applies to municipalities in Wroclaw. The average annual number of completed dwellings per 10,000 people in the years 2000 to 2011 is the highest in the municipalities surrounding large cities in Poland. The same happens in the communities neighboring Wroclaw: the urban area of Siechnice (238 new apartments per 10,000 people), Kobierzyce (174), Czernica (132), the rural area of Katy Wroclaw (109), Żórawina (69), Miękinia (66), the urban area of Oborniki.
Sląskie (65), Wisznia Mała (85), and Długolęka (95). These municipalities play the role of bedroom town – from mainly agricultural land use they have become multi-functional areas.

![Figure 2. Net migration per 1,000 people between 2009 and 2012](image)

**Figure 2.** Net migration per 1,000 people between 2009 and 2012
A – Poland, B – urban municipalities, C – rural municipalities, D – Wroclaw metropolitan area, E – Wroclaw

Source: own study on the basis of data from Local Data Bank of Central Statistical Office of Poland

In order to prevent negative processes associated with the outflow of residents to suburban areas, Wroclaw authorities have made a number of attempts to improve the quality of life within the borders of the city. One example of such is the development plan for the new settlements called Nowe Zerniki, which is compliant with the concepts of the compact city and the sustainable city. Nowe Zerniki constitutes a devastated land with military remnants (such as a concrete shelter) where place-making or creating a new urban space is now ongoing. It is also an example of re-use of previously developed land, which may be a kind of revitalization and therefore consistent with the preferred brownfield investments in the modern urban policy (Domanski 2009).

Nowe Zerniki estate, an area of about 60 hectares, is located in the western part of the city of Wroclaw, close to the new football stadium. The idea of Nowe Zerniki is to create a model example of modern, sustainable architecture and urbanism. A similar experiment was conducted in Wroclaw in the late thirties when the WUWA exhibition took place (in German: *Wohnung und Werkraum Ausstellung*). In correspondence to that idea, Nowe Zerniki is named WUWA 2. It is assumed that Nowe Zerniki might significantly contribute to improving the
image of the city, as it is one of the key promotional points for Wroclaw as the European Capital of Culture for 2016. The municipality has taken pronounced steps toward building a strong place identity while marketing it as a high quality space for work, rest and living. To achieve this objective, the municipal authorities passed a resolution of the preparation of a local master plan (act No. XVII/326/11 RMW) of 20 October 2011 which was adopted on 13 September 2012 under the name of the local master plan in the area of the northern section of the Targowa route in Wroclaw (act No. XXXI/703/12 of the City Council of Wroclaw). The approved document sets a framework that define the principles for potential investors and real estate developers. It should be mentioned that the idea of the Nowe Zerniki development was based on the close cooperation between the city of Wroclaw, the Lower Silesian Regional Chamber of Architects of the Republic of Poland, and investors.

The cooperation between different actors led to agreement on various types of housing estates – multi-family, single-family, detached and semidetached – as well as infrastructure, greenery and human-oriented public space design. Recreational areas, which are also public spaces, will be equipped with sports facilities and playgrounds.

The residential estate will become a compact system, a specific entity equipped with a school, kindergarten, nursing home and cultural community center located in a former bomb shelter. The whole Nowe Zerniki concept is designed with regard for cultural heritage and the desire to create a genius loci which will create a bond between new and old community members. The regulations of the plan shall also concern the generation of electricity and heat from renewable energy sources, which should be regarded as an environmentally friendly solution. It is important that such a provision was included in the local law document.

The local master plan involves several key solutions coinciding with the idea of the compact city and also with the idea of a sustainable city. The document indicated that the Nowe Zerniki estate should provide small-scale retail trade and services. This ensures small shops setting up and therefore the establishment of small businesses. Small retail shops, located at the critical points of investment, provide convenient access to all citizens, without the use of cars.

The transport solutions are also in accordance with the concept of the compact city. A tram line provides convenient transit between the city center and Nowe Zerniki estate. Moreover, the local master plan describes the pedestrian-bicycle lines system and sets obligatory locations for bicycle parking, which is crucial to increasing the popularity of bicycles as a means of urban sustainable transport. The main axes of the estate have been designed as green alleys to be consistent with the local master plan, which states that undeveloped and unpaved surfaces should have the function of green spaces or biologically active areas.

The analyzed master plan document has, however, some shortcomings, for instance the ratio of built-up surface in one plot should be zero or higher. That may result in too densely located housing estates, which is inconsistent with the principles of proper spatial development. The master plan lacks rigid aesthetic regulations such as regarding the color of buildings, which plays an important role in the perception of the estate on the micro as well as the macro scale.
SUMMARY

Progressive, dynamic development of cities and their suburban areas should be considered as a kind of temporal signum that confronts city planners responsible for managing the space with new challenges. It is important to pay attention to the negative aspects of the phenomenon of urban sprawl and try to avoid them, promote positive outcomes resulting from the main objectives of the concept of the compact city, and prioritize brownfield investments while reducing action on greenfield sites. The ideas described in the paper seems to be a good role model when designing urban structures, especially when combined with consciously and consistently pursued spatial policy.

Having said that, if one analyzes the growing share of area of the country covered with local master plans, it should be concluded that the situation in Poland is improving. It must be, however, underlined that the role of government in the management of the city is crucial because the authorities’ decisions have a direct impact on the quality of spatial development, namely in social, functional, economic and environmental terms.

It should also be considered that every city has its own internal conditions, unique story and specific milieu which constitutes its distinctive identity compared to other places. Creating new spaces should therefore be integrated and comprehensive. On the one hand, the heritage of the past must be respected, on the other hand the future challenges that the cities will face must be acknowledged, because the effects of the current actions will impact the quality of life of future generations.

REFERENCES


Celem artykułu jest przedstawienie wielowymiarowości zjawiska urban sprawl w odniesieniu do idei miasta zwartego oraz polityki przestrzennej. Intensywna urbanizacja, której następstwem są przemiany przestrzenne, społeczne, środowiskowe oraz kulturowe, obserwowana jest w miastach oraz na terenach podmiejskich od wielu lat. Autorzy w artykule wskazali na negatywne aspekty związane z rozlewaniem się miast oraz na pozytywne wynikające z kształtowania miasta zwartego. Narzędziem, które można wykorzystać do właściwego zarządzania obszarami miejskimi i wiejskimi, jest planowanie przestronne. W Polsce składa się ono z trzech poziomów: krajowego, regionalnego, lokalnego i stanowi instrument polityki przestrzennej. Zatem właściwie prowadzona polityka przestrzenna oraz kształtowanie miast zgodnie z ideą compact city może prowadzić do stworzenia zrównoważonej struktury miejskiej, czyli takiej, w której wzajemnie i harmonijnie koegzystuje społeczeństwo, gospodarka, przyroda oraz dziedzictwo kulturowe. W artykule wykorzystano przykład osiedla Nowe Żerniki we Wrocławiu, którego forma wpisuje się w koncepcję compact city, w rozwój zrównoważony miast oraz w idee inwestycji typu brownfield. Stanowi ono także modelowy przykład nowoczesnego kształtowania zabudowy miejskiej, z uwzględnieniem wymagań architektonicznych, urbanistycznych, środowiskowych oraz społecznych.

Słowa kluczowe: miasto, strefa podmiejska, urban sprawl, compact city, polityka przestrzenna, brownfield