

Theoretical aspects of the integrated protection of suburban areas

Teoretyczne aspekty zintegrowanej ochrony terenów podmiejskich

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Abstract

This paper draws attention to the usefulness of developing the methodology of the integrated protection of suburban areas, based on the holistic concept of space, with particular consideration to harmony among society, the environment and economy, against the recommendations and requirements posed by the European Union for modern cities. In addition, it contains an analysis of modern concepts concerning the sustainability of the city and its surroundings. Assumed population density is the most important element diversifying individual ideas of a sustainable city, though at commonly approved demand for increased compactness. It should be recognised that currently there is no generally accepted, optimal strategy of sustaining the city and its surroundings. The new needs of the information society should be the basis to search for other forms of sustainable development for cities. Development of the methodology of the integrated protection of suburban zones and their formation, based on culturally-conditioned visions of the quality of life, will enable the sustainable development of urban areas.

Key words: suburban areas, integrated protection, sustainable development

Streszczenie

W artykule zwrócono uwagę na celowość wypracowania metodologii zintegrowanej ochrony stref podmiejskich, której podstawą jest holistyczna koncepcja przestrzeni, ze szczególnym uwzględnieniem harmonii między: społeczeństwem, środowiskiem i ekonomią, na tle zaleceń i wymagań stawianym miastom współczesnym przez Unię

Europejską. Przeprowadzono również analizę współczesnych koncepcji równoważenia miasta i jego otoczenia. Najważniejszym elementem różnicującym poszczególne koncepcje *sustainable city* jest zakładana gęstość zaludnienia, jednak przy powszechnej akceptacji postulatu wzrostu zwartości. Trzeba uznać, że nie ma obecnie powszechnie akceptowanej, optymalnej strategii równoważenia miasta i jego otoczenia. Nowe potrzeby społeczeństwa informatycznego powinny być podstawą do poszukiwania kolejnych form zrównoważonego rozwoju miast. Opracowanie metodologii zintegrowanej ochrony stref podmiejskich oraz ich kształtowanie na podstawie kulturowo warunkowanych wyobrażeń jakości życia, umożliwi zrównoważony rozwój terenów zurbanizowanych.

Słowa kluczowe: tereny podmiejskie, zintegrowana ochrona, zrównoważony rozwój

Introduction

The quality of human life constitutes one of the determinants of sustainable development – achievement of a balance among all elements of the environment in which the human being exists, so that satisfaction of the needs of present and future generations is possible at reasonable use of environmental potential (Krajewski, 2012). To a great extent, the quality of city residents' life depends on the methodology of spatial development of suburban zones. It is related to ecological problems that will occur, and to their consequences for the entire city and its surrounding open landscape areas (Żarska, 2003; Zimny, 2005). Reasonable spatial development constitutes a strategic element of sustainable development (Pawłowski, 2008). It should be respected in the method of forming suburban zones, where undeveloped areas – a basic environmental resource – are currently devastated (Drapella-Hermansdorfer, 2002; Żarska, 2003; Dylewski, 2004a; Stuczyński et al., 2008). In Poland, the *Spatial Planning and Land Development Act* (Journal of Laws 80/2003, item 717) defines a commune – a basic unit of local government – as the authority deciding directly on landscape protection and formation within its borders. Commune authorities are obliged to accept the idea of sustainable development as the basis for all planning measures, concerning both the creation of new (or changes in currently valid) spatial development plans, as well as when issuing a decision on land development and management, or a decision on a site designated for public purposes (Krajewski, 2012). Yet sustainable development declared in politics and plans does not fully correspond to management methods in suburban zones applied in practice (Dubel, 2003; Kozłowski, 2005). Dylewski (2004a) emphasises that in *old member states* (EU-15) the spatial development acts do not emphasise that *everybody has the right to manage land, to which they have a legal title (...)*, as the *Polish Act* of 1994 defines it in Article 3 (*Act...*, 1994). However, they emphasise the superiority of public welfare: *Spatial planning systems aim at securing conditions of efficient and effective growth and development of areas for public welfare*, as e.g. corresponding British governmental documents state (*The Planning System...*, 1994). Moreover, in spite of mature democracy and recognition of the subsidiarity principle, including a commune's right to man-

age its own area, obligations under spatial planning are transferred to communes with great care, gradually and only when they manifest the appropriate potential of substantive and staff capabilities. The central authority supports them in this – by the system of planning advice and recommendations concerning crucial and current problems. It supervises them strictly too, with regard to the main goal, i.e. compliance with conditions of sustainable development and broadly understood public welfare (Dylewski, 2004a).

In Poland, since the political transformation, the development of suburban zones is very often converted into a non-controlled process of land development extension and landscape degradation (Drapella-Hermansdorfer, 2002; Zebura, 2007). Currently, changes in lifestyle and higher income cause significant urbanisation pressure and expansion of private housing in suburbs, often without consideration of the needs of protecting the environment and its characteristic functions (retention, buffering, biological). Therefore, sustainable development of the suburban zone is related to rationalisation of spatial management principles, including protection of landscape structures that connect the city's environmental system and the ecological system of protected areas beyond its borders. This is one of the basic conditions of urban environment revalorisation and of the health of city residents (Przewoźniak, 2002; Zimny, 2005).

The *Habitat Report* of the National Secretariat (HABITAT, 2003), appointed according to the UN guidelines, includes broad assessment of the weaknesses and disadvantages of the Polish spatial management system. The system's weakness hampers reasonable spatial management and reasonable land development, often making them near-impossible. This negatively affects the quality of life of the residents, as well as the conditions and possibilities of the sustainable development of Polish cities, communes and regions (Dylewski, 2004a). Highly critical assessment of the Report (HABITAT, 2003) mainly concerns:

- absolute domination of private interest over public interest (meeting the immediate demands of land owners and investors), which has affected the very essence of modern urbanism,
- underestimation of the higher needs of residents, especially prospective needs,

- lack of a substantially and competently strong central institute (department) ultimately responsible for Polish land management, substantively supporting and supervising communes, competent to stop detrimental investment or planning decisions,
- substantive weakness of communes, especially the majority of small communes,
- practical non-functionality of the whole system, resulting from unclear relations among planning at central, regional and communal levels.

This becomes the reason for, among others: the practically unhampered, spontaneous phenomenon of the *extension* of urban development into surrounding areas, damage to preserved natural and cultural values, deterioration in the quality of the functional and spatial structure of urbanised areas and the quality of life within them. The *Report of the National Secretariat* (HABITAT, 2003) proposes taking comprehensive actions to repair and reform the spatial development system in Poland.

Therefore, suburban zone protection should constitute an integral part of the comprehensively considered problems of urban landscape protection and utilisation. Protection of suburban zones will not be efficient without consideration of landscape scale (Żarska, 2005). On 27 August 2004, Poland ratified the *European Landscape Convention*. This obliges the state-signatories to promote landscape protection, management and planning, as well as to organise cooperation within the scope of landscape-related issues at European level. The level of social maturity expressed by the level of its needs certainly constitutes the crucial (and key) condition for the implementation of protection and sustainable development of the suburbs (Dylewski, 2004).

Sustainable protection of urbanised areas should include the following tactical elements in its implementation strategy (Szulczewska, 2002):

- incorporation of knowledge about functional-spatial, socio-economic and environmental considerations,
- identification of conflicts in the present state,
- ecological, social and economic consequences of applied protective measures,
- integration of sustainable management concepts in the diversity of spatial and temporal scales,
- recognition of prospects of the developmental dynamics of a city and a region, including their association with global changes,
- implementation of flexible management based on the ecosystem's evolutionary character,
- consideration of the aspirations of local communities.

It is impossible to conduct unilateral remedial measures in suburban areas under the conditions of sustainable development, e.g. only within the scope of improvement of environmental conditions or modernisation of the technical infrastructure. These

measures are mutually dependent; therefore, they require comprehensive scientific, design and implementation considerations, in accordance with the concept of integrated urban and environmental revitalisation (Przewoźniak, 2002).

This paper draws attention to the usefulness of developing the methodology of the integrated protection of suburban areas, based on the holistic concept of space, with particular consideration to harmony among society, the environment and economy, against the recommendations and requirements posed by the European Union for modern cities. In addition, it contains an analysis of modern concepts concerning the sustainability of the city and its surroundings.

The scientific literature contains few comprehensive studies that synthesise knowledge within the scope of the integrated protection of suburban zones. In addition, there are no popularised studies concerning methods to assess the condition of housing spatial order and environmental protection in suburban zones.

Recommendations and requirements for modern cities imposed by the European Union

Cities provide the motor power of every country's development. Therefore, EU institutions take great interest in the issue of urbanisation of its member states. The number and rank of documents and reports issued within this scope, for example: *Green Paper* (1990); *New Athens Charter* (1998); *ESDP* (1999); *CEMAT* (2000), prove this statement. These documents may be treated as sets of criteria for the development of modern European cities, their quality in environmental, social, economic and prospective aspects (Dylewski, 2004b; Petryshyn, 2012). General conditions of development in the above-mentioned EU documents include:

- The principle of the sustainable development of the European continent. According to the meaning of the notion *sustainability*, this considers the needs of all European regions' residents, without prejudice to the rights of future generations, aimed at the harmonisation of economic and social requirements with the ecological and cultural functions of particular territories, which contributes to long-term, broad and sustainable spatial development (CEMAT, 2000).
- A polycentric model of development. This is consistent with the principle of sustainable spatial development historically established in Europe, and should be maintained. Therefore, development should include the entire settlement structures of regions and countries, in their full hierarchy – from small towns, through medium-sized ones, to the largest cities. This will prevent formation of the *centre – periphery* model, i.e. the establishment of isolated growth areas. In this context, the leading role in the development

of entire settlement structures, and consequently of whole regions, is assigned to metropolises and metropolitan areas. Among metropolises, cities of supra-regional, European (Europolis) significance are especially significant; this particularly concerns the so-called *Gateway Cities* of the European Union, which connect Europe with other global zones.

- General European quality standards for cities determine the criteria of *Europolis* status. They include primarily:
 - ✓ appropriate demographical potential (at least 0.5 million residents);
 - ✓ multifunctional character, capable of developing functions of European significance;
 - ✓ established centres of science, higher education and national culture;
 - ✓ crucial location in the European communication system;
 - ✓ high environmental and cultural values.
- Conditions for the development of cities (metropolises). According to the EU documents, these conditions mainly include (Dylewski, 2004b):
 - ✓ quality of communication links of the city with the state and the wider world;
 - ✓ quality and amount of development that the area offers, especially with city-forming potential;
 - ✓ quality of the city environment, its appeal and strength of attraction.

At the same time, reports confirm that the development of city-metropolises aims to activate development of the regions they serve. In free market conditions, competition among cities on a national and European scale is the road to development. The offer of development must be accordingly attractive, inspiring and encouraging for potential investors.

- Town-planning management tasks. Limitation of the growth tendency of suburban areas for the benefit of increased access to other areas.
- City plan. Town-planning designs, i.e. plans of development and management in general and detailed scales, should primarily constitute the development offer. The principle of permanent and sustainable development must be the basis of all planning studies (New Athens Charter, 1998). According to EU experts, correctly prepared plans require:
 - ✓ high expertise of the town-planning staff;
 - ✓ cooperation with scientific, professional and political communities, social organisations, and dialogue with society;
 - ✓ town-planning competitions, in search of a more accurate vision;

- ✓ guidelines, support and substantial supervision of the department, region and persons jointly responsible for the results.

EU documents emphasise that the basic task of spatial planning is constituted by protection of the public interest in the dimension both of current and prospective needs, i.e. significantly, qualitatively higher social requirements (Dylewski, 2004b). *The guidelines of the European Union (Green Paper, 1990; New Athens Charter, 1998; ESDP, 1999; CEMAT, 2000)* give special significance to the current and prospective quality of the city. The quality of the city and its surroundings, considering the natural and cultural environment, their structures and functioning, is regarded as a prevalent criterion of assessing the state and conditions of development. It is also the main goal of town planning. Requirements within this scope increase together with the development of the society and maturation of the quality of its needs. According to the EU experts, factors on which this quality is based include:

- Quality of the environment. Priorities includes protection, revitalisation and development of natural recreational areas, increased efficiency of environmental functioning (to reduce the anthropogenic load), as well as its increased potential for influencing perception and behaviour. The amount and quality of open areas constitutes the quality measure of the city.
- Quality of the cultural environment. Strong emphasis is put on the need for improved protection of the city's cultural heritage, both within the scope of historical heritage and modern urban and architectural structures (the spatial culture of the city), as well as in development of the network of cities. In addition, *protection of cities against trivial standardisation in the international style* is necessary.
- Quality of the city structure. According to the recommendations of the EU experts, this is indicated by the achievement of fair living conditions for the residents, at the highest possible saving of area and land, and by minimum transport needs. It requires compact but healthy land development with mixed functions that reduce transport needs (accommodation, services, recreation and workplaces that are not a burden on the environment), near larger open areas. Only problematic structures – those that put health and safety at risk – or structures requiring special exposure need to be isolated. This model is defined as a *complex of small towns*. Towns with deliberately different characters meet the condition of *wide choice*, allowing for fuller satisfaction of the diverse needs of residents. In addition, one restores the special role to actual centres of the structure, instead of the periphery, as locations to integrate the city and shape its

identity and image. These centres should be developed above all. The necessity of non-violation of open areas is also emphasised. Open areas in present towns should be enlarged, e.g. by using post-industrial areas. City structure must be formed according to the principle of sustainable development, where open areas with significant ecological, cultural and social functions have permanent, indefensible positions.

- Careful management of the city's ecological system. Preventing and inhibiting environmental degradation, especially in reference to public places, as well as with regard to infrastructure, water, power, waste and noise levels.
- Public transport. Development of efficient and ecological means of public transport which may contribute to sustainable mobility, and the development of bicycle lanes and passageways – collision-free, separated, attractive, welcoming and environmentally friendly.
- Peripheries (suburban zones). Despite various regulatory and protective measures, often insufficiently effective against the power of the phenomenon, increasing town-planning chaos in suburbs has unambiguously negative social, economic and ecological consequences. EU recommendations aim in two directions. Firstly, as-efficient-as-possible stoppage of the uncontrolled extension of cities through creation of so-called *green belts* of high ecological and landscape value, balancing the settlement macro-structure – the direct surroundings of the city should be permanently green. Secondly, reasonable development of settlement in the crucial areas of the city's functional zone, i.e. creation of agglomeration structures enriching the central city, increasing its economic and marketing power and its chance of being selected, therefore its appeal and power of attraction – the main assets of competitiveness. Revitalisation of the present state of suburbs is also necessary. Wherever possible, introduction of the spatial order of land development in these areas and implementation of its functional integration with the city is recommended, assuming preservation of as many open areas as possible.

Analysis of modern concepts of the sustainability of the city and its surroundings

Compact city

The idea of the compact city refers to the belief that liveliness, diversity and cultural richness constitute the essence of urban life. In fact, more than half the human population participates in this, so the problem of its quality becomes increasingly significant (Górka, 2002). The amorphous growth of cities threatens rural areas. Housing concentration inside present urban areas is the remedy (Fauset, 1999). As Górka (2002) emphasises, the aspect of the quality

of life in the city and the aspect of rural area protection both connect the *compact city* concept with the idea of sustainable development. Fauset (1999) indicates new ecological standards which should be met by buildings in a compact city, based on the principle of sustainable development (high thermal insulation, passive use of solar power, natural ventilation, environmentally-friendly building materials, recycling of building materials, locally produced materials, alternative power sources, energy-efficient heating systems, conversion of existing buildings), as well as by means to achieve a higher quality of life in the city:

- increased population density from 100% to 300%;
- diversification of the methods of utilising urban areas;
- consideration of energy-saving rules when designing new structures.

Masnari (2001) mentions the following factors as indicators of the quality of life: access to urban facilities and services, car travel time, public health and social relationships. According to Fauset (1999) and Masnari (2001), increased density of urban areas to 500 or even 700 persons per hectare does not have to be related to significant growth in housing density. Increased density of population may be achieved through:

- limitation of the number of parking lots to one parking place per apartment, or their complete elimination, which would allow the acquisition of space for, respectively, 500 persons/ha or 700 persons/ha;
- construction of houses on existing free plots of land;
- introduction of residential development in areas with previously different functions, as well as opening ground floors and first floors for services;
- conversion of residential buildings into tenement blocks;
- conversion of courtyards and backyards, *economic* views of buildings.

The cited authors prove that practical implementation of these means allows for construction of 3-4-storey buildings, or 5-6-storey buildings in the case of keeping the tendency of one- and two-person households. Mansari (2001) indicates that the idea of the compact city allows for reduction of passenger car use by up to 70%. In addition, it reduces the distance of car travel, except for commuting and periodical larger shopping. Therefore, it does not eliminate private car use. The diversity of functions and high density of population do not cause increased use of public transport (Harvey, 1996). According to Harvey (1996), one cannot just say that higher city density results in reduced car traffic. Significant disadvantages of the compact city include also smaller amounts of greenery and open areas, and privacy limitation (Górka, 2002). The highest efficiency of actions towards the *compact city* has been observed

in towns with a high share of multi-family residential developments and local services (Burton, 2001).

Urban village

The idea of the urban village is based on traditional aesthetics. It adopts the organic, holistic, urban, polycentric nature of pre-industrial districts of large and small towns (Górka, 2002). The British movement promoting the development of urban villages – Urban Villages Campaign – began its activity in 1992 under the patronage of Prince Charles. It takes actions for the benefit of economic, ecological and social sustainability in the developed urban environment (Colquhoun, 1994). The following features characterise the urban village concept (Górka, 2002):

- multifunctionality and self-reliance;
- diverse forms of ownership of residential developments and commerce;
- compactness beneficial for various forms of activity;
- site significance, diverse architecture;
- walking access to urban services and attractions;
- the impact of residents on planning and team management.

The perfect urban village has 3-5 thousand residents and workers, and occupies an area of 40 hectares, which gives a diameter of 900 meters in a circular shape, as well as walking access within no more than 10 minutes. The adoption of sufficient critical mass and diverse ownership forms are beneficial for rich social life: heterogeneity, participation, and the establishment of contacts (Colquhoun, 1994). Social participation in planning and management constitutes an important proposal in the formation of urban villages. Public spaces also play an important role in the urban village concept. Due to clear plans and reference to existing historic elements, they enable residents to identify with a place and construct their identity (Górka, 2002). A clear plan of streets which radiate from small quarters around the central square to larger residential blocks benefits pedestrians and cyclists. Car access to the city centre should be limited but not excluded. Functions generating car traffic should be located at the periphery of urban villages, preferably between them (Colquhoun, 1994). The urban village should constitute a compromise between centralisation and decentralisation (Górka, 2002).

Important epistemological and ontological issues at the grassroots level of this model are the subject of criticism of the urban village concept (Harvey, 1996; Górka, 2002). Harvey (1996) bases them on the following premises:

- searching for the *shape of the future* in the past fixes out-of-date city forms and out-of-date ways of thinking;
- in the epistemological and ontological sense, social processes, instead of the city – as a *thing* – should be a priority when thinking about the

city. The rank of social processes should not be limited to the dimension of spatial forms relevant for them;

- the modern city is a kind of *palimpsest* including various layers established in various time periods.

Harvey (1996) emphasises that space cannot be divided from time, as there exists an *indefinite number of non-convergent time series and indefinite number of separate spaces*. Space is not a *passive vessel of social actions* in the Cartesian-Newtonian understanding. Social processes create spaces and space-times, remaining in continuous relation with them. According to Harvey (1996), the idea of a society constituted by urban villages has three disadvantages: 1) the mythical belief that an *object* called society may be created as an independently existing, autonomous whole, 2) the belief that the qualitative features of this *object* can be defined from the inside, 3) the belief that its external relations are more fragmentary and accidental than integral and continuous.

New Urbanism

At the turn of 1980s and 1990s in the USA, the New Urbanism trend was established, also defined as the New Urban Design movement (Newman, Kenworthy, 2001). The concept of this trend converges significantly with the goals of the British Urban Villages Campaign (Górka, 2002). Towns proposed under New Urbanism are clearly aimed at suburban areas, where multi-functional centres are to be developed, integrating residential functions with trade, social instruments and workplaces. All facilities inside the complex are to be available within a five-minute walk of the stop. The town (settlement) should occupy a surface area of max. 100 acres (approx. 40 ha), have five thousand residents, and offer three thousand workplaces. Its population density should amount to 50 persons/acre (approx. 125 persons/ha). The main criteria of New Urbanism include (Hasic, 2001):

- the centre of each neighbourhood should be defined by public space and animated by local public and commercial activities;
- each residential complex should offer many types of apartment and function;
- the role of the car should be limited in the future;
- new architecture should correspond with the surrounding architectural tissue.

The New Urbanism concept emphasises the significance of traditional neighbourhoods and the importance of social problems. The development of an integrated, heterogeneous society, which is *more interactive, less individualistic and separatist, oriented towards public life* (Górka, 2002), is postulated.

Permaculture

Permaculture (permanent agriculture) is the idea of growing agricultural products in the city, in all areas

not included in *municipal* use, i.e. on waste ground, roadsides and near houses (Kennedy, 1992). Kennedy (1992) claims that this is *a method of planning and designing based on sustainable economy and cultivation that provides healthy food, power, heat and beauty. Permaculture systems try to comprehensively create relations among many elements of city life. They build vision and ethical bases.* In the United Kingdom and the Netherlands, municipal waste grounds, which are public property, are divided into plots of land whose area comprises approx. 500 m². These plots are leased for growing vegetables and flowers. Garden Clubs in the Netherlands and Australia constitute a form of popularising permaculture. Such clubs are established as close to the city as possible, while their members visit at least once a week. So-called cluster-title is a more extensive form of space utilisation. Ten or more persons purchase 150 acres (approx. 60 ha) of land. They divide this into plots, each of 1,000 m² surface area, and rent these to city residents (Mollison, Holmgren, 1987). According to Mollison and Holmgren (1987), extensive public recreational areas maintained by permanent residents will be a consequence of combining the principles of permaculture, Garden Clubs and cluster-title. The idea of permanent agriculture evokes the tradition of municipal garden plots. Their goal was to provide the possibility of contact with nature and to provide fresh fruit and vegetables for poorer people. The first garden plot was established in Leipzig in 1864. Subsequently, they became popular throughout Germany and other European cities. In Poland, the first garden plots were established in 1908 in Gniezno and Poznań. In 1949, the legislator imposed the obligation of establishing garden plots on towns in which 20% of the population lived in multi-family buildings. In the 1960s, the typical garden colony in Poland included 200-500 garden plots, whose area amounted to 100-500 m² each. The transformation of garden colonies to wild settlements was quite a frequent phenomenon (Górka, 2002). Drapella-Hermansdorfer (2008) emphasises that the employee garden plot movement has been the only force able to defy the investment lobby in post-war Poland.

Jurydyka

According to Bogdanowski (1982), *jurydyka* is an attempt at developing spatial structure based on the analysis of Polish city traditions. It constitutes a continuation of such analysis in response to the social, cultural and environmental problems created by housing estates. *Jurydyka* was to be a formally, organisationally separate and independent spatial unit as a *small town*, or to constitute part of a big town as a *district* (Bogdanowski, 1982). This concept integrates well with the urban village theory. At town-planning scale, the basis of this model is constituted by the market square, the street, the plot of land, and by sequences: street – pre-garden plot – house (2-4

floors) – courtyard – garden and apartment – tenement – commercial *boulevard* street – market square. The concentric model enables free distribution of non-residential functions. According to the *jurydyka* concept, the modern housing complex should meet specific requirements within the scope of its content, form and function (Bogdanowski, 1982):

- through richness of social and cultural content, as well as defined borders of the complex, it should enable identification of residents with the place and development of their own traditions;
- the form of a complex should be original, both in the surrounding landscape and in the landscape of urban interiors;
- distribution of functions should meet the requirement of efficient operation through connection of elements in all possible relations.

Ecosystem model

In her concept of the city-ecosystem, Szulczewska (2002) formulates the *principles of sustainable development of the city* and divides them as follows: 1) city-surroundings relation – *responsible city*; 2) desired (optimal) city size – *middle-sized city*; 3) required spatial structure of the city – *compact, diverse, integrated city*; 4) city functioning (use of resources) – *economical city*; 5) recommended sectoral policy and its rules – *functional city*; 6) organisation of social life in the city – *friendly city*; 7) creation of economic basis for city development – *prosperous city*; 8) city management – *skilfully managed city*; 9) city development planning – *city with a vision*. She also presents relationships and dependencies among specified groups of principles (Fig. 1).

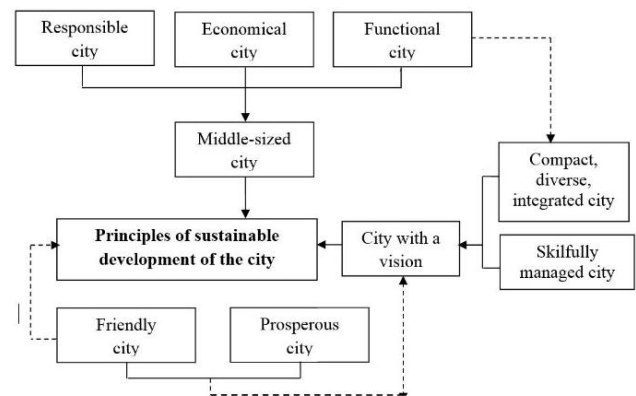


Figure 1. Relations and dependencies among specified groups of principles in the sustainable development process (Szulczewska, 2002).

According to Zimny (2005), the ecosystem model proposed by Szulczewska (2002) enables one to obtain the current recommendations and directions of sustainable city development. However, it does not exhaust all the issues within this scope, and neither is it fully precise. Zimny (2005) emphasises that it is difficult to separate some issues, such as planning city development and forming the required structure.

Moreover, it is a concept designed only for medium-sized cities, while the leading role in development of whole settlement structures in the European Union is assigned to metropolises and metropolitan areas (CEMAT, 2000).

Interesting proposals for a new form of city functioning in Poland also include Kowicki's (1997) concept of the – *town in a rural enclave*. This is the concept of a farmers' and non-farmers' settlement in rural areas. It assumes that it is possible to maintain essential elements of the rural enclave landscape in conditions of ecological agriculture (Górka, 2002). The proposed model aims at recreating or strengthening an *authentic village and authentic town*, co-creating a sustainable environment (Kowicki, 1997). In Kowicki's concept (1997), rural enclaves constitute areas of stabilised settlement and agriculture. Non-farmers move from rural enclaves to towns within their area or beyond it. Kowicki (1997) lists the following features of such towns:

- the number and size of towns is balanced against the natural resources of enclaves;
- impassable town borders are permanently designated;
- the individually defined size of a town is not larger than 1,000 residents per five hectares;
- prohibition of town development and the order to establish new ones in different areas;
- lack of a transitional zone at the border of towns and agricultural lands;
- sport and recreational belts around towns;
- housing development as an external ring; parking, administration, manufacturing and commercial functions are located inside;
- localisation in the least agriculturally useful areas;
- creation of a network of nodes – compositional dominants in the landscape;
- respect for present divisions of arable land.

Kowicki (1997) bases his model on the hierarchic network of communal, rural and neighbourly social and service centres. Notable Italian architect, Paolo Portoghesi, one of the main representatives of post-modernism in architecture, designed such small towns for permanent and temporary populations in Vallo di Diano (Górka, 2002).

To sum up, it must be recognised that there is no commonly accepted optimal strategy of sustainability for the city and its surroundings. Various spatial scenarios are possible – from the compact city to housing extension (Domański, 2000). The models discussed should not be regarded as universal, as they were established in a specific socio-cultural environment and respond to its specific needs in a way conditioned by its features. Therefore, the sustainable city cannot be a specific structure created on the basis of rules adopted *a priori* (Górka, 2002). Attempts to define urban forms responding to the proposals of sustainable development are not proceeding smoothly. The very term *sustainable city* raises

doubts. Orrskog (1999) quotes the following arguments of opponents:

- the city does not exist without its neighbourhood;
- the city concept is an anachronism in an entirely urbanised society;
- the city as a physical structure and organisation cannot be sustainable or non-sustainable;
- nobody manages the city as a whole;
- functional territorial connections lose their significance for the benefit of network connections;
- utopia cannot exist in the postmodern society.

Kistowski (2008) claims that *The category of 'sustainability' cannot be applied to the landscape in the same way that development can. Sustainable development is often understood as permanent (in time and space), while permanent landscape does not have to be sustainable (and vice versa), because it may require continuous delivery of matter and power to maintain its permanence. Sustainable landscapes may occur when they meet the criteria of sustainability in all three layers of its understanding: functional, structural and physiognomic.*

According to Kistowski (2008), so far the concept of sustainable landscape has not found sufficiently broad application in spatial planning, which may result from subjectivism, the difficulty of the application of some methods of assessing the sustainability of landscape, as well as the lack of terminological standardisation. In addition, it is worth drawing attention to the fact that next to the trend of sustainable cities, the opinion of the city not differing essentially from natural ecosystems in its manner of functioning (manifested in the pro-social vision of the *ecopolis*) has been initially approved (Tjallingii, 1995). The modern state of knowledge within the scope of designing and building cities (e.g. the Dongtan ecopolis in the Shanghai region) eliminates artificial divisions into natural and anthropogenic environments. It is connected with the notion of cities as a kind of *third nature*, constituting the highest evolutionary field of *first nature* (natural or quasi-natural ecosystems in urban areas) in the process of nature urbanisation (Drapella-Hermansdorfer, 2008).

It should be emphasised that the idea of city sustainability reminds us that it is part of the world of nature transformed by the human being. The traditional town (active element) – village (passive element) dichotomy has given way to an urban-rural partnership, which brings bilateral benefits and the chance of a higher quality of life in the whole *ecological region* (Górka, 2002). Co-participation of urban society is necessary in the process of forming the sustainable development of cities, which usually means a fight for the quality of space and life in the city of today and for future generations. Recognition of the leading role of the socio-cultural aspect in defining spatial features of sustainable settlement will enable

research that has a more integrated and design-oriented approach (Górka, 2002).

Delimitation of suburban zones

Structures of various, often mutually exclusive, functions have emerged in suburban zones. In such conditions, delimitation of the suburban zone from the city part encounters significant difficulties (Kostrowicki, 1990; Zimny, 2005). Determination of the external borders of the suburban zone has been the subject of much research and inquiries by various specialists (Burton, 2001; Górka, 2002; Markowski, 2002; Pawłowski, Szymski, 2002; Zimny, 2005). Considering this issue historically, the suburban zone has been determined by its distance from the city and its accessibility, although these criteria are not always appropriate (Kostrowicki, 1990). Environmental criteria applied at delimitation of suburban zones consider, among others, the level of air and soil contamination. Many studies (De Kimpe, Morel, 2000; Kahle, 2000; Baran et al., 2010) show, that the level of urban environment contamination depends strictly on the urbanised area. These studies demonstrate a much higher concentration of anthropogenic contamination in city centres rather than in suburban zones.

In addition, a method based on assessment of the level of mosaicism and synanthropisation of ecological systems is recommended. General regularity has been identified, according to which the mosaicism of ecosystems in the suburban zone is the largest, and is gradually decreasing both in the direction of city and rural areas (Markowski, 2002). Cities are developing in range and in many directions, thus delimitation of the borders of the suburban zone with this method encounters significant difficulties (Zimny, 2005). Complex analysis of mutual relations and dependencies between natural and social factors and the economy in typically rural, urban and suburban environments is best for this purpose. Every spatial system (downtown, suburban zones, rural areas) includes five sub-systems. These contain natural, social, technical, manufacturing and management sub-systems (Kostrowicki, 1990). Specific interactions occur among particular sub-systems and create a specific style of functioning through modification of their state. The character and strength of relations among system elements, and among these elements and external open areas, have been adopted as the basis for allocation of spatial systems (Morawska, 2003; Zimny, 2005).

While examining the significance of sub-systems as a source of influence on the city, suburban zones and typical rural areas, Kostrowicki (1990) proved that the following sub-systems had the largest impact on functioning of the suburban zone: technical, manufacturing and social (Tab. 1). While analysing the same dependencies from the point of view of a re-

ceiver, i.e. the strength of adopted interactions, the author claims that the suburban zone had the strongest impact on the natural and social environment (Tab. 2).

Table 1. Significance of sub-systems as a source of influence on the city centre, suburban zone and typical rural area (Kostrowicki, 1990).

Source	System type		
	City	Suburban zone	Village
(values of multiple regression coefficients)			
Natural sub-system	19	49	74
Social sub-system	87	79	58
Technical sub-system	96	89	51
Manufacturing sub-system	97	81	63
Management sub-system	84	68	65

Table 2. Significance of the city centre, suburban zone and typical rural area as receivers of influence (Kostrowicki, 1990).

Receiver	Sub-systems				
	Natural	Social	Technical	Manufacturing	Management
(values of multiple regression coefficients)					
City	92	87	77	69	70
Suburban zone	83	80	63	76	58
Village	53	72	55	79	55

The summarised data (Tab. 1-2) indicates that the most changeable sub-systems include society, nature and the manufacturing-consumption system, while management and technical investment systems are the most durable. Whilst analysing the sum of differences, it should be emphasised that the suburban zone is closer to the city than to the village, which is related mainly to the process of urbanisation (Zimny, 2005).

Suburban zones are characterised by internal diversity of the environment and the method of their functioning. This is different from analogous features both in urban and in typical rural areas. This diversity concerns all natural components, both biotic and abiotic (Zimny, 2005). The difference is most strongly expressed in the structure of vegetation cover (Tab. 3). The data in Table 3 show that the sub-

urban zone is characterised by a 4.5x higher number of biocenosis types, much larger mosaicism of vegetation systems, and an almost 5x higher share of the number of synanthropic species, as well as by a significant decrease in the stability of ecological systems (approx. 50%) than in typically rural areas. As opposed to the city centre, the suburban zone clearly includes less synanthropic species, less mosaicism of vegetation cover, but a higher number of species as calculated per 1 km², and far greater durability of ecological systems (Tab. 3).

Table 3. Diversification of vegetation in the city and suburban zone as compared to rural areas – adopted as indicator 1 (Zimny, 2005).

Properties	Type of area		
	City	Suburban zone	Village
Number of types of biocenoses	0,6	2,7	1
Share of synanthropic species	0,4	4,8	1
Average number of species per km ²	0,7	2,3	1
Stability of ecological systems	0,2	0,6	1
Mosaicism of vegetation systems	0,3	5,8	1

In summary, it may be ascertained that the suburban zone has been established and formed by the city, whose influence has many directions: direct and indirect, both positive and negative. Cities increase the capacity of socio-economic development, deliver workplaces, and provide access to education and culture, but at the same time they negatively affect the environment through emission of pollutants. In recent years, individual location decisions, as well as the aesthetic and economic calculations of particular investors, have affected the state of suburban landscapes. Here, different impacts and interests collide, whose consequence is the location of, for example, dumping grounds, sewage treatments and warehouses. These strange spatial structures become a source of various social conflicts and landscape degradation. In addition, investments related to the creation of pan-European systems of technical infrastructure, particularly motorways and dual carriageways, contribute to the threat for suburban landscapes.

Integrated protection of suburban areas

Due to the fuzzy definition of the suburban zone, the issue of the sustainable development of suburban areas is very seldom undertaken as an independent research subject (Parteka, 2001). However, proposals in documents of the European Commission (*White Book*, 1995; *New Athens' Charter*, 1998; *ESDP*,

1999) prove that the term *sustainable city* cannot be limited to the area of strict urban investment: it includes regional relations including suburban areas (Górka, 2002). Sustainable cities are to ensure: a) welfare in the whole region, b) the chance for satisfaction of the needs of future generations, c) no threat to neighbouring regions and beyond (Domański, 2000). The depth of the suburban zone depends on the character and function of these areas, and does not always overlap with administrative boundaries. A suburban zone may be described through functional-spatial, natural and landscape relations occurring among neighbouring areas. These relations have decisive impact on the functioning of the zone (Morawska, 2003). The concept of protection of the suburban zone should include all the significant processes, relations and dependencies occurring in suburbs.

The issue of the integrated protection of suburbs has the following basic aspects:

- substantial aspect – physiological, ecological, environmental, resource-functional, landscape issues;
- spatial aspect (internal and external protective measures);
- temporal aspect (period and durability of obtained protective effects);
- legal aspect (legal considerations of active protection);
- conflict aspect – protection as the source of spatial and social conflicts (Dubel, 2003).

The substantial aspect generally has ordinal and systematisation significance. All ecophysiological, environmental, resource-functional and landscape structures are mutually related. They create a complicated system of processes and phenomena, whose comprehensive research, design and formation are very difficult (Dubel, 2003; Morawska, 2003; Zimny, 2005). Ecophysiological measures include four main phases: diagnosis, assessment, forecasting and guidelines (Majer, 2007). Diagnosis includes recognition and characterisation of the structure and functioning of the environment, sources of anthropopressure, the state of development and use of the environment, and description of previous changes in the environment (retrospection). Objectivism and the full characteristics of processes occurring in the environment require long-term monitoring. The assessment stage consists in analysis of information obtained in the diagnostic phase, including the evaluation of quality and resistance of the environment to degradation, the state of landscape value preservation, the character and intensity of changes occurring in the environment, threats and possibilities to limit them, the scope of protection of environmental values and resources, the usefulness of the environment for performance of socio-economic functions, compliance of current use and development with environmental considerations, and the occurrence of conflict situations in the environment. The forecasting

stage includes initial assessment of directions and intensity of changes in the environment occurring under the influence of present land use and development, as well as evaluation of the occurrence of potential conflict situations in the environment. The guideline stage constitutes the synthesis of arrangements from the preceding phases. It should include three main groups of guidelines concerning: the capacity of limiting or eliminating environmental threats, the indication of areas predisposed to perform environmental functions (greenery) in the spatial structure of the area, as well as areas useful for performing various socio-economic functions (Majer, 2007). The environmental problems of the integrated protection of suburbs include two complementary issues: reduction of anthropopressure, and increased resistance of the environment to anthropogenic loads. The first issue is technical and organisational, while the second is ecophysiological (Przeźwiński, 2002). The resource-functional and landscape scope mainly concerns protection of the attractiveness and recreational usefulness of suburban zones (Pawłowski, Szymiski, 2002).

The spatial aspect is related to the need of protection both of urban and suburban zones (internal measures) and external open areas (external measures), with regard to diffusive migration of anthropogenic contaminants, as well as fauna and flora, due to their ability to move and implement the most important natural connections in space (Żarska, 2003; Mackenzie et al., 2005). Internal and external measures will enable achievement of the higher goal of protecting suburbs – improvement of the ecological conditions of human life, for example through protection and connection of the city's ecological system with its natural surroundings.

The temporal aspect concerns the duration and durability of obtaining the results of suburban zone protection. The durability of results of protecting suburbs depends on environmental and anthropogenic considerations. Both may stimulate or limit the effects of protective measures (Baranowski, 2000). In the case of environmental considerations, this depends mainly on the character of local environmental dynamics and the trend of changes. In the case of anthropogenic pressure, it depends on the type, intensity and scope of anthropopressure (Janikowski, 2004).

The legal aspect includes regulations concerning environment and landscape protection, along with conditions of using the environment within the scope of the emission of pollution and maintenance of environmental resources (Dubel, 2003; Żarska, 2005). The protection of suburbs is hampered both by the changeability and ambiguity of the law, as well as by methods of suburban zone management applied in practice (Dubel, 2003; Dylewski, 2004a; Kozłowski, 2005). The legal provisions themselves do not protect endangered landscape resources – they need to

be properly utilised to transform the possibility of protection into efficient operation.

The economic aspect concerns incurred costs, which increase together with the application of efficient, integrated means of protecting suburbs. Here, efficiency refers not only to the reduction of negative physical, chemical and biological impacts, but also to aesthetic, landscape, cultural, functional and health impacts, which are very difficult or impossible to quantify.

The nature of the conflict is often spatial (especially infrastructural) and economic. It results mainly from incorrect information policy and improper organisation of suburban protection implementation (Baranowski, 2000). Reduced consumption, and the necessity of taking into account the needs of future generations constitute the foundations of sustainable development (Pawłowski, 2008; Dąbrowski et al., 2012). The theory, that each element – society, environment and the economy – while adopting extreme values is able to disturb other components, is obvious and does not require special documentation. It seems that that economy on a global scale has entirely dominated all areas of socio-economic life, and even such areas as environmental protection and education are strongly dependent on it. It causes problems with ranking the scale of needs and selecting the sequence of their implementation in the context of the limited financial capacity of a region or commune, as well as the expected social costs of implementing the integrated protection of suburbs. In suburbs, a compromise among different purposes and different spatial users is necessary. Usually, its achievement is not simple – it requires the comparison of irreconcilable phenomena and values (Sas-Bojarska, 2003). Integrated protection of the suburban zone, being subject to intensified investment pressure, should constitute the main direction of suburban zone development. This is influenced by inefficient use of space, the chaos of town-planning structures, negative social and ecological phenomena, and increased operating costs. The improvement of human living conditions, including ecological conditions, is the higher goal of protecting suburbs.

Conclusions

1. The suburban zone is the sight of occurrence of a series of environmental, functional, spatial and landscape processes, which are rarely subject to comprehensive and systematic assessment during creation of development policy and the development of plans.
2. Conducted analysis of modern concepts of the sustainability of the city and its surroundings indicates that there is no commonly accepted, optimal strategy within this scope. Different scenarios from the compact city to housing extension are proposed.

3. Assumed density of population is the most important element diversifying particular concepts of the sustainable city, providing that the demand for increased compactness is commonly accepted.
4. The new needs of the information society should be the basis for seeking other forms of sustainable development of the city and its surroundings.
5. Development of the methodology of integrated protection of suburban zones and their formation, based on culturally-conditioned concepts of the quality of life, will enable sustainable development of urbanised areas.

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