

The Development of Residential Areas on the Example of Łuków: Reurbanization and Suburbanization

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Abstract

In planning documents, extensive land for housing is generally designed in the outskirts of cities. Suburbanization results in social costs and high costs of provision of technical and social infrastructure. The aim of the work is to develop and present a method of designating residential areas in such a way as to reduce the social and economic costs of spatial development of cities, improve spatial order and achieve long-term social benefits. In the example of Łuków, a vision of spatial development of a city was proposed by its reurbanization. New housing zones were designated near kindergartens, primary schools and basic health care facilities so that residents could reach them on foot. Maintaining the human scale of residential areas will limit traffic and its negative externalities. Areas that should not be used as land for housing construction were indicated to preserve ecological order. The change in spatial development of cities, from suburbanization to reurbanization, requires the pursuit of urban policy at all levels of public authority through the use of legal, planning, investment, financial, fiscal, property management, information and participation instruments.

Keywords: urban sprawl, external benefits, land for housing, reurbanization

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Introduction

Demographic forecasts of the Central Statistical Office show a continued decrease in the population of Poland, from the current number of approximately 38 million to 34 million by 2050.¹ Spatial development plans of communes, covering less than 30% of the territory of the country, designate land for housing permitting the construction of dwellings for 62 million people.² The designation, in local plans and studies on the conditions and directions of spatial development, of extensive residential areas constitutes a specific incentive for developers' investment expansion to peripheral areas of cities and suburban areas not provided with technical and social infrastructure. Through the mechanism of this growth machine, cities "sprawl" onto suburban areas, where undeveloped and relatively cheap agricultural properties are found. However, the chaotic and rapid suburbanization, described as urban sprawl, occurs at the cost of environmental, agricultural and recreational space. In areas of dispersed building development, the costs of provision of a network technical infrastructure are very high. Their residents also bear social costs, because they lose time on travel to service facilities in cities. Therefore, they have less time for fulfilling social roles and live in constant haste and stress. This increasingly frequently leads to the collapse of family and social bonds.

1. See: Prognoza dla powiatów i miast na prawie powiatu oraz podregionów na lata 2014–2050 (opracowana w 2014 r.). [forecast for counties and cities with county status as well as sub-regions for the period 2014–2050], [@:] <http://stat.gov.pl/obszary-tematyczne/ludnosc/prognoza-ludnosci/prognoza-dla-powiatow-i-miast-na-prawie-powiatu-oraz-podregionow-na-lata-2014-2050-opracowana-w-2014-r-,5,5.html>.

2. See: Raport o ekonomicznych stratach i społecznych kosztach niekontrolowanej urbanizacji w Polsce. Warszawa, 29 października 2013, page 3, [@:] http://www.frdl.org.pl/pliki/frdl/document/zalaczniki_artykuly/Raport%20Ekonomiczny%2029.10.2013%20calosc.pdf.

The objective of the paper is therefore to present a method of designation of residential areas in such a way as to reduce the social and economic costs of spatial development of cities, improve spatial order and obtain long-term social benefits. The paper presents an empirical example of the city of Łuków, where reurbanization was adopted as the assumption for the designation of new residential areas. The study results are presented in a map, prepared in Quantum GIS and CorelDRAW software, with the application of cartographic backgrounds from: Geoportal, municipal and county office, and Municipal Engineering Services Enterprise in Łuków.

1 Theoretical basis

Spatial development is defined as quantitative and qualitative changes in land development, understood as durable material transformations of land surface. It involves the expansion of building development into non-urbanized peripheral areas of cities and suburban areas, described as greenfield sites, or qualitative transformations of the functions and spatial development of degraded central areas of cities (brownfield sites). In other words, spatial development can occur through suburbanization or reurbanization and revitalization of cities, including social, economic and ecological actions aimed at the improvement of living conditions of residents through the intensification of social and economic activity.

In brownfield areas, however, barriers and limitations occur, described as development thresholds. Overcoming them requires incurring high expenditures within a short time. According to Malisz (1971) thresholds include: physiographic (environmental), functional (land use), technological (infrastructural) and structural barriers, referring for example to the land ownership structure. Such a threshold can be degradation of the environment, technical infrastructure or dwelling stock (frequently historical buildings), as well as social degradation: pathologies or poverty and the accompanying fear of gentrification (Eckerd and Heidelberg 2015). It is defined as the removal of poor residents from the occupied buildings through increasing rent fees after modernization by the owners. Overcoming development barriers requires ordering the legal status of the property. This particularly refers to bankrupt stock of liquidated industrial plants and their sites. It also requires the provision of replacement housing to persons threatened with gentrification. The requirements of conservation protection of historical tenement houses, the necessity to provide replacement housing and protests against gentrification generate costs which often discourage developers from revitalizing degraded central areas of cities. They are not interested in investing in undertakings with low rate of return and high risk related to overcoming urban development thresholds, and communes usually have no financial resources for social and economic revitalization of degraded areas of cities.

High costs and barriers of revitalization encourage developers to implement housing investments in greenfield areas where building development encounters no social resistance, housing construction progresses faster and generates lower costs in comparison to investments in brownfield sites (Billert 2006). In greenfield areas, the investor obtains both the effects of scale and land rent, related to the consolidation and parcellation of agricultural properties into regular plots, their transformation in the local spatial development plan to building plots and provision by the commune of technical and social infrastructure (Adams and Watkins 2002). In Poland, in the conditions of a lack of *ad valorem* property tax and common failure to charge a betterment levy (from an increase in the value of property related to: its provision with infrastructure, division and consolidation or division) and planning fee,³ developers often take over the entire generated land rent.

The mechanism of spatial extensive “sprawl” of cities is explained by the growth machine theory. Property as a product has a usable value and exchange value (Bury, Markowski, and Regulski 1993). The usable value is related to its physical attributes and functions. The exchange (economic) value refers to the property’s turnover in the market: its sale or renting for the purpose of obtaining the maximum possible rate of return. The exchange value of land property is more important for developers than the usable value (Molotch 1988).

3. After five years from passing or amendment of the local spatial development plan, the owner can sell the property without incurring such a fee.

According to the public choice theory, public authorities similarly to developers follow their private interest and seek rent. They frequently act against the interest of the local communities and pass regulations in favor of narrow pressure groups (theory of economic regulation). Developers force local authorities to transform the function of greenfield areas to land for housing. Lack of assertiveness of local authorities that yields to the pressure (capture theory of regulation) constitutes an incentive for undertaking housing investments in greenfield areas (Myna 2012). Developers also solicit for (usually silent) support of local communities, convincing them about the usable values of housing investments.

The inflow of housing development, economic activity and population increases the benefits of spatial concentration (agglomeration), therefore attracting further companies and residents to greenfield areas. Together with growing intensity of development, external benefits for residents and entrepreneurs increase, as well as the exchange value of the property (Bury, Markowski, and Regulski 1993). Such external benefits include positive economic and non-economic effects occurring locally and constituting the result of the activity of entities in the surroundings (Myna 2012). They are classified into flow, resources and structural benefits (Polski 2013). Flow external benefits involve access to streams of services, consumers or information. Benefits of resources include social, infrastructural, environmental or cultural development factors. Structural benefits concern the demographic structure, size and ownership of properties or functional-spatial structure of a settlement unit. They particularly refer to the spatial concentration of complementary functions or functions of a single type. For service providers, an external benefit is demand, and for consumers a diverse offer of sale of goods and services. External benefits and therefore location rent, cause an increase in the value of land properties and amount of fees for their rental.

However, excessive intensive land development results in external disadvantages and social costs (air pollution or noise), negatively affecting the quality of life of residents, whereas they cannot obtain compensation from perpetrators responsible for unfavorable external effects. Threshold costs and costs of environment degradation through excessive transformation of arable and forest land for non-agricultural and non-forest purposes also increase (Mickiewicz, Mickiewicz, and Sobala 2013). This results in the degradation of green belts surrounding cities.

An alternative to urban sprawl is offered by the reurbanization of cities through their sustainable development and revitalization of degraded central areas. The basic assumption of urban sustainability is the improvement of the quality of life of residents and other users of the city, through: creating positive external effects and social benefits, economic and rational management of space and energy (ecological collective transport, energy-efficient houses or avoidance of housing dispersion), preservation of the values of the natural and cultural environment for future generations and formation of spatial order (Mierzejewska 2009). It involves management of space so that it constitutes a harmonious whole, and considers all functions and socio-economic, environmental, cultural and composition-aesthetic conditions in its ordered relationships.⁴ In a broad definition, it covers integrated spatial order understood as high quality of life, and in a narrow definition, it refers to aesthetic values of space without consideration of its functional, social, cultural, economic and ecological aspects (Jędraszko 2005).

In a “city for people,” residents feel safe, space is easily recognizable, positively evaluated, developed with people’s participation, used by them and therefore full of life (Gehl 2010). Service facilities located near residential houses meet the needs of residents with no necessity of using cars. In such a case, the pedestrian has priority, and not the car (the “green transport” and “less roads—less traffic” rule). This encourages residents to move on foot (Newman and Kenworthy 2015) or by bicycle and creates conditions for social interactions. According to Gehl (2010), buildings cannot be too high, because apartments above the fifth floor are not adjusted to the human scale. Space around multi-family housing should be justly divided for each user to find space for his own activity without generating social conflicts.

4. See: Ustawa z dnia 27 marca 2003 r. o planowaniu i zagospodarowaniu przestrzennym. DzU z 2003 r. nr 80 poz. 717.

2 Conditions of development of residential areas in Łuków

The city of Łuków, located in the north-western part of the Lubelskie Voivodship, has the function of the county center. The north-western part of the city is located within the ECONET ecological network (Krzna River, Łuków Area of Protected Landscape). The eastern part of the city features a fragment of the Radzyń Area of Protected Landscape. The environmental values, accessibility of basic services and possibility of meeting needs of a higher order, make Łuków an attractive city.⁵ In the period 1995–2014, the number of dwellings in Łuków increased by 18%.⁶ Three and four-room flats were dominant. They constituted more than 61% of all housing stock. Together with an increase in the number of dwellings and a decrease in the number of residents, the mean area of an apartment per one resident of the city increased by 18%. In 2014, it amounted to 24,6 m²(⁷), but it remained lower than the mean value for Poland.⁸ However, the local real estate market showed evident disproportions between the low value of arable land and relatively high value of built-up land and land intended for housing.⁹ The shallow real estate market and low demand discouraged investors from building dwellings for sale or rent.¹⁰

Łuków is characterized by a favorable spatial-functional structure. Residential and service functions are usually located in the central part of the city, and industrial functions in its peripheries, supplemented by urban green areas and the green belt surrounding the city. The peripheral areas are dominated by arable land. In the study on the conditions and directions of spatial development (in year 2006) and local spatial development plans, in the outskirts of the city, extensive residential and service zones were designated at a considerable distance from infrastructure facilities. Their designation did not consider the threshold costs of the development of technical infrastructure, the occurrence of arable land of class higher than IVa, or forecasts of the Central Statistical Office pointing to a decrease in the number of population of the Łuków County by 2050.

3 The new residential areas: method and social benefits on the example of Łuków

The paper proposed a vision of reurbanization of Łuków as a city friendly to people, a city at a human scale, where residents enjoy the spatial accessibility of basic services and do not bear the social and economic costs of the sprawl of urban functions. Modernization and expansion or adaptation of the existing buildings for residential purposes was proposed and “sealing” locations of the new residential building development were designated. They fill undeveloped spaces with access to a public road, occurring amongst the existing housing sites. The assumption of the project (concept) of location of new residential areas is the use of the existing technical infrastructure, particularly capital-intensive sewage network,¹¹ preventing water pollution and expansion of infectious diseases.

The proposed locations of residential areas were therefore linked with factors influencing the living conditions of residents, with the most important one being the accessibility of facilities of the basic social infrastructure (kindergartens, primary schools, health care centers). Residents experience comfort when such objects can be reached on foot within 10–15 minutes. Pursuant to the “city for people” rule, it was assumed that the distance from residential areas to a kindergarten should not exceed 450 m, and to an elementary (primary) school 700 m. Due to the independence of

5. Price per 1 m² of an apartment not much higher than the average salary in Łuków can be an incentive for moving to the city.

6. Own calculations based on data published by GUS in 2017 at the Local Data Bank.

7. [In the journal European practice of number notation is followed — for example, 36 333,33 (European style) = 36 333.33 (Canadian style) = 36,333.33 (US and British style). — Ed.]

8. Own calculations based on data published by GUS in 2017 at the Local Data Bank.

9. See: Operat szacunkowy wartości nieruchomości położonej w Łukowie przy ulicy Farfak. Łuków, 2010.

10. In 2015 in Łuków, the contribution of this type of apartments was very low and amounted to only 8% (data published by GUS in 2017).

11. In the period 2014–2016 in Łuków, the average price of construction of 1 m of the sewage network amounted to PLN 597,96, more than four times more than 1 m of water supply network (data of the Municipal Engineering Services Enterprise in Łuków).

secondary school pupils in moving around, less importance was ascribed to the accessibility of secondary schools.

Good accessibility of kindergartens and elementary schools only occurs in the central part of Łuków, whereas residents of its western part and the southern part of the “New Łuków” district have difficult access to this type of facilities (fig. 1). The situation is similar in the case of accessibility of basic health care facilities, although the frequency of using them is not as high as that concerning primary (elementary) schools. The maintenance of high spatial accessibility of the basic services will limit traffic within the city and residential areas, generating social benefits. They include: saving time and reduction of stress related to the possibility of moving on foot instead of individual or collective means of transport, psychological comfort of children attending kindergartens and schools and comfort of their parents, improvement of safety of pedestrians and particularly children, improvement of the quality of the environment (decrease of emission of exhaust fumes and reduction of development of a road network in environmental areas), and economic benefits (savings in the commune budget related to the avoidance of expenditures on the development of roads and reduced use of fuel). The concept of development of residential sites also involves the designation of areas excluded from any building development: the Krzna River valley threatened with flood, areas with soil sanitation classes higher than IV a and forests (fig. 1).

More than 70 ha of “sealing locations” was designated in Łuków. However, the designation of zones of new residential housing was not based on cadastral division of registered plots (an assumption of their consolidation and parcellation was adopted). Figure 1 shows locations preferred for residential investments due to good spatial accessibility of kindergartens and elementary schools, as well as the sewerage and road networks. The darker the color, the better the conditions for housing development, due to the overlapping of external benefits of social and technical infrastructure. A total of 208 residential areas were designated. The largest one occupies more than 10 ha and the smallest ones have at least 500 m² each. The designed areas of land for housing investments were grouped into three zones, considering the socially accepted time of reach of kindergartens or elementary schools.

The proposed zone No. 1 of land for housing, covering more than 13 ha, is characterized by the best accessibility of the basic social and technical infrastructure (fig. 1). It should be the first to be covered by the local spatial development plan and subject to housing construction. Without the consideration of the expansion, alteration or adaptation of the existing buildings, with the assumption of a capacity of 200 persons per ha in multi-family housing, and 40 persons in single-family housing, the construction of dwellings for 1 320 persons in multi-family housing, and for 264 persons in single-family housing, will be possible in the zone No. 1. Assuming that the constructed

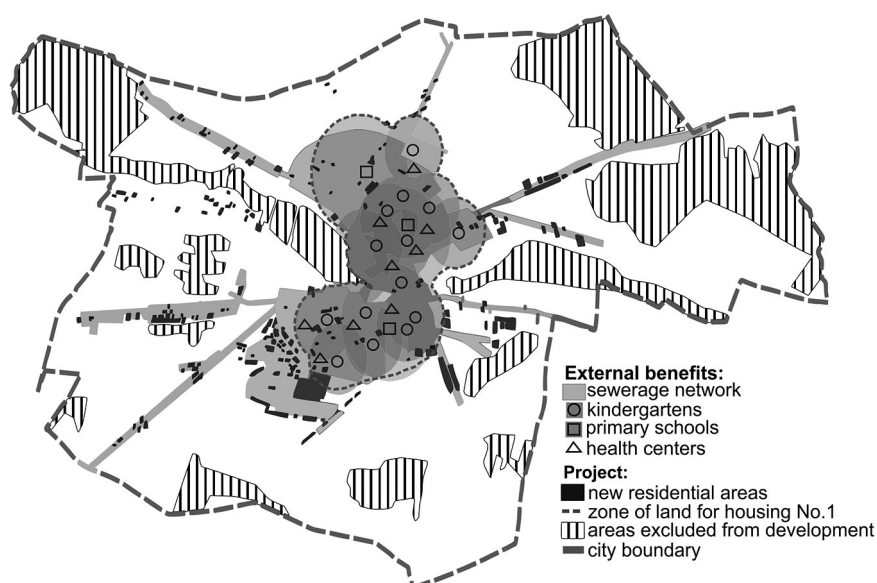


Fig. 1. External benefits and proposed new residential areas in Łuków

buildings are inhabited only by the residents of the city, an increase in the mean area of an apartment per 1 person will amount to 1,4 m², and its average dwelling floor space per 1 resident will increase to 26,0 m².

At a distance of 400 m from the boundary of zone No. 1, residential zone No. 2 was designated, characterized by the possibility of reaching objects of the basic services within 20 minutes. The second zone covers approximately 26,5 ha. In combination with the first zone, this permits the construction of dwellings for 7 965 persons in multi-family housing or for 1 584 persons in single-family housing. Outside zones No. 1 and No. 2, sealing areas for housing development were designated, provided with sewerage network, constituting zone No. 3. Expanding the designed residential areas by this zone increased the potential housing capacity: for 10 880 persons in multi-family housing or for 2 176 persons in single-family housing.

The possibility of expansion of the first, second and third zones by a fourth one was also pointed out, covering locations with no technical and social infrastructure. In all of the four designated zones, dwellings for 14 470 persons in multi-family housing, or for 2 894 persons in single-family housing could be constructed. Launching housing development areas in the fourth zone, however, would require incurring threshold costs of the provision of technical infrastructure and social infrastructure facilities.

The benefits of the proposed development of residential areas include an improvement of the ecological, social, economic and aesthetic order, developing public value (general benefits for the society). The indicated locations of residential areas will not negatively affect the natural environment of Łuków and its vicinity, although increasing the density of housing development could have a certain impact on the ventilation of the city. Anticipating potential spatial conflicts, solutions were therefore proposed, preventing the deterioration of the ventilation of the city. The following was proposed: development of residential areas in the form of low building construction, avoidance of widening roads and leaving the green belt in the city outskirts. The Krzna River valley constitutes the main corridor of the ventilation of Łuków. Therefore, its ecosystem should not be interfered with in any way. In the presented concept of development of residential areas based on the reurbanization of Łuków, the environmental values will be preserved. This would not be possible in the case of development of residential sites in the peripheral areas of the city and in the suburbs at the cost of irreversible transformation of arable and forest land into building plots.

The proposed locations of residential areas will bring investors and residents economic benefits. In the conditions of increasing the density of building development, in areas provided with technical infrastructure, the cost and waiting time for connecting new buildings to the existing networks will be limited to a minimum. Residents will not bear social costs, and economic costs of investments in infrastructure which would have to be incurred by the local authorities if housing development occurred in the peripheral areas of the city, and in the suburbs. The efficiency of use of the existing sewerage and water supply network will increase, whereas housing development in peripheral and suburban areas would entail the expansion of such networks and a decrease in the efficiency of their use. In reference to the sewerage network, it would mean a reduction of the amount of sewage discharged to the sewerage network per 1 km of network length. Connecting new houses to the existing network will therefore reduce the unit cost of its exploitation. The saved resources can be allocated for example to the construction of social housing.

The designed residential areas will not collide with functions causing negative external effects and social costs. Ordering frequently abandoned, neglected and degraded properties will also improve the aesthetic order, providing conditions favoring the integration of neighbors, constituting an important element of social order. The aesthetic values of urban green areas, residential zones, squares and other representative places will improve the positive perception of the city by the residents as well as visitors.

Threats to the implementation of the presented concept of development of new residential areas include: the land ownership structure, tendency for urban sprawl, determinations of the local spatial development plan (which should be altered by the proposed solutions), defectiveness of provisions of the act on spatial planning and spatial development, marginalization in local plans of social and economic conditions of spatial development, and lack of urban policy at the central level of

public authorities. The non-regulated legal status and reluctance of owners to sell undeveloped properties is a problem (the hoarding function and psychological factors). It reduces the supply of potential building plots. However, the city's tendency for urban sprawl is the main risk factor which may prevent obtaining the objectives of the presented concept of development of residential areas. Lower prices of building plots and possibility of transformation of agricultural properties into building plots can convince residents to construct houses (based on decisions on conditions of building development and land management) on their land properties, usually located in peripheral areas of Łuków.

Another risk area is the marginalization in local plans of social and economic conditions of spatial development and sticking to the analysis of environmental conditions only. The assumptions and directions of spatial development of Łuków stipulated in the city's planning documents suggest the possibility of construction of infrastructure from scratch in peripheral areas of the city. This remains in contradiction with spatial order and the vision of reorganization, presented in this paper. The act on spatial planning and spatial development should therefore oblige local authorities to designate new land for residential development based on obligatory analyses of demographic processes, transport accessibility, economic conditions and capacity of the existing land for housing. This type of analyses should be prepared from the point of view of the public interest, comparing long-term benefits and social costs of the development of residential areas in the variants of reurbanization and suburbanization. Areas with external benefits of social and technical infrastructure should be the designated as the first to housing development. Until the exhaustion of their capacity, spatial development plans for new land for housing should not be prepared and building development should not be commenced for land not provided with basic infrastructure.

Conclusions and recommendations

In planning documents, extensive areas of residential development are usually designated in peripheral areas of cities, at a considerable distance from infrastructure facilities. Their construction results in social costs and high costs of provision of technical and social infrastructure on such land. This paper proposes an alternative vision of the spatial development of the city through its reurbanization. Zones of new residential areas were designated in the vicinity of kindergartens, elementary schools and basic health care facilities, so that they are reachable on foot. The maintenance of the human scale of residential areas will permit reducing traffic and its negative external effects. Areas were also designated which should not be used for residential development to preserve the ecological order.

The pattern of extensive development of peripheral areas of cities, common in Poland, constitutes the primary barrier of reurbanization and revitalization. Therefore, a change in the approach to spatial development requires the implementation of urban policy on all levels of public authorities. Space is a rare good and one of the objectives of spatial policy remains counteracting urban sprawl with the consideration of economic, social and cultural or environmental conditions, and application of: legal, planning, investment, financial, fiscal, property management and information-participatory instruments.

The application of the commonly binding legal norms is aimed at the protection of agricultural and forest land developing green belts around cities. Legal regulations on the national level can also facilitate revitalization by private entities, their activity in the real-estate market or construction of apartments for rent, although they can also make revitalization more difficult (excessive protection of tenants or restrictive regulations of rent fees). However, the existing legal norms make it impossible to solve the problem of undeveloped land in centers of cities where private owners block revitalization and sale of properties, reducing the availability of building plots. The obligation of completing housing construction within a specified time, limited to plots purchased by investors from the commune, is an example of such an instrument at the local level.

Planning and investment instruments constitute a source of information for the private investors on the preferred directions of spatial development of the city. Provision of infrastructure in land for housing development attracts private investments (Gorzym-Wilkowski 2006). A good example

for urban planners are solutions applied in Germany, where areas of new building development are covered with a local plan when the commune has resources for providing them with technical infrastructure. In Poland, resources for the provision of technical infrastructure in extensive residential areas are scarce, leading to flawed urbanization as well as external disadvantages and social costs. It is therefore necessary to introduce obligatory determination of the capacity, and regulation of the order of development of building sites, based on obligatory spatial demographic, economic and ecological analyses. It is also necessary, as in the countries of Western Europe, to designate boundaries of urbanization of greenfield areas through arrangements in the general spatial development plan of the commune (no such instrument is applied in the current legal system in Poland).

Financial and fiscal instruments can constitute an incentive for investors for revitalization and transformations of the functional and spatial structure of cities in accordance with the public interest. In Western Europe, such tools include: investment grants, tax reliefs related to investments, accelerated amortization or reduced rates of the planning fee. They are applied as incentives for the revitalization of degraded city districts with unattractive location, where low land rent does not constitute an impulse for undertaking revitalization measures. Precautions against gentrification (for example subsidies to rent fees) should constitute an incentive for the residents' involvement in the revitalization processes. In attractive areas of large cities, fiscal instruments, an ad valorem property tax (not binding in Poland), a betterment levy and planning fee, should permit public authorities to take over part of the land rent (as source of financing investments in infrastructure). However, without the development or update of a cadaster, it is not possible to introduce the ad valorem property tax.

Real estate management instruments (for example development of land "banks", land consolidation and property division and refusal to divide land properties in "urban sprawl" areas) should constitute a tool of counteracting rapid and chaotic suburbanization, and simultaneously an instrument of support of reorganization of cities. Cooperation of territorial self-government units and investors should be aimed at a reduction of the cost of construction of municipal and social housing (e.g., the commune transfers land for social housing development to the investor on conditions more favorable than market conditions), and therefore rates of rent fees (Jędraszko 2005).

Economic, legal and real-estate management instruments will remain largely inefficient in counteracting urban sprawl and promoting reurbanization through revitalization, if local authorities do not apply information and social participation tools. They include: the identification of the values, needs, preferences and expectations of residents and entrepreneurs, negotiation of interests or determination of the scope of revitalization, its socially acceptable costs and rates of rent fees accepted by residents after revitalization. In the participatory model local authorities and spatial planners conduct social dialogue and consultations, consider barriers and restrictions concerning reurbanization and revitalization, and convince residents of the need of it. Residents and other social partners, as well as public authorities of all levels, are responsible for spatial development. This type of managing is called governance, contrary to the term government understood as bottom-up management, with the predominance of formalized, frequently exclusively bureaucratic planning processes (Billert 2006).

In Poland, not all of the aforementioned instruments can be used by public authorities, due to legal restrictions. Some instruments of spatial policy exist, but are not used by public authorities, or used by them to a low degree (for example the betterment levy). The risk factor is therefore lack of urban policy at the central level, and insufficient tools which would convince private entities that revitalization is the key instrument in the reurbanization process.

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