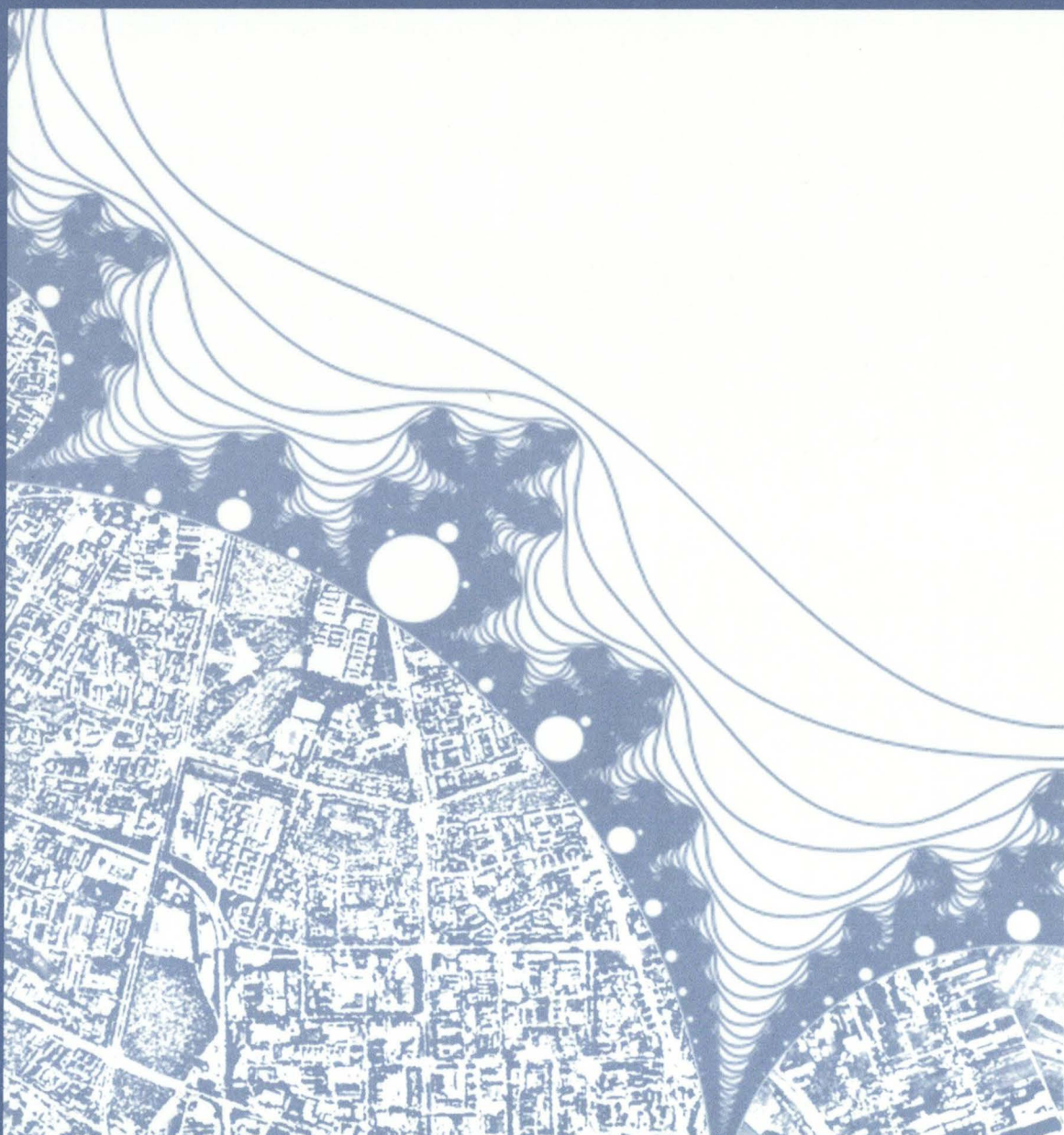


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IM. STANISŁAWA LESZCZYCKIEGO
POLSKA AKADEMIA NAUK

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DEVELOPMENT OF URBAN-RURAL REGIONS: FROM EUROPEAN TO LOCAL PERSPECTIVE



MONOGRAFIE

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Piotr Werner

KSZTAŁTOWANIE SIĘ REGIONÓW
MIEJSKO-WIEJSKICH;
OD PERSPEKTYWY EUROPEJSKIEJ
PO SKALĘ LOKALNĄ



WARSZAWA 2012

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Introduction

There is a continuous motion within the rich array of theoretical concepts pertaining to urbanization processes and urbanization phenomena. Their changing nature is reflected in the emergence of ever new concepts. The latter include the notions of the rural-urban region, as well as of the peri-urbanization process. The interest, as attracted by these concepts is a consequence of changing relations between urban and rural areas; their progressing integration in terms of social structure, cultural landscape, as well as of functions performed.

These concepts were at the core of research programme of PLUREL, a EU Sixth Framework project on: 'Peri-urban land use relationships – strategies and sustainability assessment tools for urban-rural linkages', carried out from January 2007 until March 2010, and coordinated by Dr. Kjell Nilsson, from Faculty of Life Sciences at the University of Copenhagen.

This volume documents the work conducted in the framework of PLUREL at the Institute of Geography and Spatial Organization, Polish Academy of Sciences, a partner in the project. The Institute contributed to three out of five major project segments – the modules, mainly Module 2: Land-use relationships in rural-urban regions, and Module 3: Governance and planning strategies. The region of Warsaw was one of PLUREL's case study regions, along with regions of the Hague, Leipzig, Koper, Manchester, and Montpellier. The present report contains selected contributions, out of a wider set of studies prepared at the Institute within the course of the project.

In the first chapter of the volume the concept of the rural-urban region is discussed – its content, interpretation, and policy relevance, as developed and applied in PLUREL's empirical studies, as well as its relation to some earlier conceptualizations of the evolving nature of urban-rural linkages.

The second chapter is devoted to typologies of rural-urban regions, the theme that was focusing considerable attention over the project's life time. Its broader context is presented in the review and assessment of earlier typologies of rural-urban, as well as urban regions in Europe. This is followed by exposition of assumptions and results of two typological studies carried out by the authors, and by discussion on the relation of these attempts to the so-called RUR typology, one adopted as PLUREL's general-purpose typological scheme.

In chapter three, concerning interdependence of socio-economic development and land use change, account is given of analyses performed at the territorial level of the EU, using the set of NUTS-3, i.e. subregions, as basic units. The work is aimed at identification of common indicators of socio-economic and land use differentiation of space, and of the so-called response functions that link pairs of strongly interrelated variables referring to socio-economic development and land use structure. Findings ensuing from this analysis are utilized in specifying a model of spatial socio-economic potential. Spatial distribution of the potential values are confronted with the patterns of urban, peri-urban, and rural areas in Europe, both observed, and projected for the year 2025. In another section of this chapter results are presented of a questionnaire-based study on location and relocation factors of selected categories of service-sector firms within the region of Warsaw.

This case study region also represents the object of enquiries which are reported on in the remaining part of the volume. Chapter four focuses on general, as well as specific features of peri-urban areas. Three such study areas were identified and subjected to in-depth analysis on the basis of data collected in an especially designed, face-to-face interview survey. In chapter five land use projections are presented, which were constructed for the Warsaw Metropolitan Area using the MOLAND model. These projections refer to two alternative future development scenarios, formulated and elaborated in the course of discussions with planners and stakeholders from the region. This model simulation experiment may help to prove the utility of scenario-based projections in the evaluation of possible effects of alternative spatial policy approaches.

1. THE NATURE OF URBAN-RURAL REGIONS

The *urban-rural region*, and its mirror image, the *rural-urban region*, represent recent additions to the rather extensive list of notions pertaining to spatial and functional dimensions of urbanization processes and urbanization phenomena. Their introduction into scientific, as well as planning related literature reflects the growing interest in sustainability of urban development, in particular its environmental aspects.

Urban-rural relations at a regional level were in fact already accounted for by the classical spatial economic theory. Walter Christaller's (1933) market areas, composed of urban places distributed across a non-urbanized territory, could be interpreted as a type of *urban-rural regions*. Conversely, the model of agricultural land use elaborated by Heinrich von Thuenen (1826) is a prototype of the *rural-urban region*.

The traditional perspective on spatial and functional relations between urban and rural areas within a region is one of the formers' dominance. Thus, in the concepts of *stages of urban development* (Klaassen *et al.*, 1981), the city-bound migration streams have their origins in the surrounding rural region. Similarly, the range of work and service oriented commuting flows, from suburban and rural communities to inner urban areas, is used as one of the main criteria in the definitions and delineations of *daily urban systems* (Berry, 1973), and of *functional urban regions* (Hall, 1973; Kawashima and Korcelli, 1982).

With regard to economic linkages, the dependent position of rural *vis-à-vis* urban areas is represented explicitly in the concept of the *polarized region* (Boudeville, 1978). In such a region, the regional pole – its main urban centre – which is the focal point for the local and regional linkages, dominates over the smaller urban places, and in particular, over the rural areas.

An alternative, and to a large extent a novel approach to the question of urban-rural relations was adopted in the European Spatial Development Perspective (ESDP, 1999). In this document, the notion of *urban-rural partnership* is advanced as one of spatial policy objectives and options for the territory of the European Union. These options include integrating the rural areas in spatial development strategies for urban regions, aiming at efficient land use planning at a regional

scale, supporting the maintenance of public services, and providing other means with the aim of enhancing the quality of life in rural parts of the urban-rural regions.

Such postulates are especially pertinent in the situation when, as throughout large parts of Europe today, and unlike in the case of traditional, polarized regions, the functional distinction between urban and rural zones of urban-rural regions is increasingly blurred. Christer Bengs, who led a major ESPON (2004) project on: *Urban-Rural Relations in Europe*, made the following observations on the bases of that study results:

“...the functional division of labour between town and countryside is increasingly indifferent...the rural life is urbanized by transcending commodity relations, and life styles are appropriated according to mass consumption patterns regardless of location...; the countryside and rural life are not seen as residual factors of urbanism, but an equally important counterpart in a relationship between urban and rural settings, and, more generally speaking, between urban and rural life. ...Urban-rural linkages are now moving beyond the single one-way exchanges and demonstrate a more complex and dynamic web of interdependencies, which are shaping the fortunes of cities and countryside alike. It is this recognition of the complexity of urban-rural relationships, which has gained a new political salience both at national and European levels” (Bengs, 2005, p. 225–229).

These ideas were already present in the concept of the *urban field*, a prototype of the urban-rural region, which anticipated the fusion of urban and rural by a gradual integration of metropolitan areas with the inter-metropolitan periphery. As J. Friedmann and J. Miller (1965, p. 312) wrote almost half a century ago: “Looking ahead to the new generation, we foresee a new scale of urban living that will extend far beyond existing metropolitan cores and penetrate deeply into the periphery. Relations of dominance and dependency will be transcended. The older established centers, together with the inter-metropolitan peripheries that envelop them, will constitute the new ecological unit of ...post-industrial society...”. This extended scale of urban life would be based not only on deconcentration of various economic functions traditionally performed by urban areas, but also on the emergence of a number of new activities, mainly those connected with leisure, culture and education. Hence, the *urban fields* would offer: “...a wider choice of living environments both for resident and non-resident use, and more interchange among environments”.

The enlargement of functional areas and the intensified interconnections of urban and rural zones does not occur without some cost. Christer Bengs (2005) points out that access to consumption spaces, which constitutes an important aspect of new urban-rural relations, is rarely in accord with the sustainability principle. This sounds as an echo of J. Friedmann's earlier warning concerning negative effects of policies, and the practice of land development that allow unrestrained consumer choice to determine urban and rural land use.

The concept of the *rural-urban region (RUR)*, which has been developed and applied in the PLUREL project, is based on the premise of functional integration and partnership relations between the urban and the rural areas. The man–envi-

ronment interactions are considered to be a major aspect of processes that occur within the *rural-urban regions*.

When confronted with the earlier concepts, the PLUREL approach reveals several specific characteristics. Firstly, it puts an emphasis on the development of activities, the land use and population change within the *peri-urban* zone, the area that can be considered predominantly rural in physical terms, but to a large extent urban with respect to the multitude of functions performed. The multifunctionality and dynamics of change that is taking place in peri-urban zones, the development of economic activities and the transition of land use patterns, are seen as the main features of these areas (Pauleit, 2007).

Secondly, in this concept particular importance is attached to a category of functions defined as *ecosystem services*, which indicate the special position occupied by rural zones within the regions. These functions pertain to interaction between the natural environment on the one side, and the society and the economy on the other. Such services include, *inter aliae*, air purification, regulation of micro-climatic conditions, water retention, provision of space and landscape quality. Also, the special role of agricultural ecosystems in the provision of some essential services of this type is recognized (Degórski, 2010).

Thirdly, it has been assumed that the character of urban-rural interdependence, and the course of its evolution, depend upon such features as population size, demographic change, intensity and spatial morphology of human occupancy of the territory – the factors that, when arranged in a certain combination, give rise to distinct *types* of rural-urban regions. Fourthly, following the logic adopted in PLUREL, the rural-urban regions may represent territorial and functional aggregates which are suitable units for identification of major spatial policy issues, as well as for the implementation of spatial policies and strategies.

According to the PLUREL concept, the *rural-urban region* is formed by spatial clusters of three interrelated regional subsystems – the urban, rural, and peri-urban areas. These subsystems are arranged into basic sub-regions, i.e. the urban core, the zone of transition from urban to rural areas that composes its suburban and peri-urban surroundings, and the rural hinterland. The structure of these sub-systems in terms of the number of components, their size, location and interrelations, have an impact on the way these subsystems cluster, and determine the nature of the rural-urban region, its size and complexity. Rural-urban regions may take forms of monocentric or polycentric regions. Both types of regions are internally differentiated and functionally, as well as morphologically complex. This complexity is an important asset and, at the same time, a development challenge. Rural-urban regions provide differential offer as places of residence and spaces for the location of economic activities. The attracting factors include proximity to areas of recreational use, food supply and nature conservation. Concentration and juxtaposition of numerous functions in rural-urban regions may bring conflicts resulting from the intensity of land use, land use pressure, and mutually opposite plans for land development. Such conflicts appear especially often in the peri-urban areas.

According to an idealized scheme, the region's spatial structure is conceptualized as consisting of several zones, arranged in a more-or-less concentric pattern.

The urban areas include the urban core as well as inner-urban and suburban zones. The outer part of the suburban zone – the urban fringe – marks the transition from urban to peri-urban areas, the latter consisting of discontinuously urbanized zones characterized by a mixed pattern of land use.

This definition of *peri-urban* areas, and their positioning *vis-à-vis urban fringe*, represents one among numerous approaches to be found in the literature on urban studies. R.J. Pryor (1968), in an early review of the relevant concepts and their applications, made a distinction between *the urban fringe* and *the rural fringe* that constitute subzones of *the rural-urban fringe*. He defined the latter as "...the zone of transition in land use, social and demographic characteristics, lying between (a) the continuously built-up urban and suburban areas of the central city, and (b) the rural hinterland, characterized by the almost complete absence of non-farm dwellings, occupations and land use, and of urban and rural social orientation; an incomplete range and penetration of urban utility services...; a rural-urban fringe can only exist between a growing urban center and its rural hinterland..." (*ibid.*, pp. 61–62).

Hence, the rural-urban fringe is seen here as corresponding to PLUREL's *peri-urban areas*. R.J. Pryor traced the origin of the notion of *the urban fringe* to a study published in 1937 by T.L. Smith, according to whom it signified "the built-up area just outside the corporate limits of the city". Mutual positioning of suburban zones, the urban-rural fringe, and peri-urban areas can also be conceptualized in terms of the urban-rural continuum (see: Bański, 2009). This should not, however be identified with the rural-urban continuum as a social concept.

Following the approach adopted in PLUREL, the territorial extent of peri-urban areas is seen to correspond to the range of intense, daily travel to work within this local system – the commuting between, as well as within the individual zones. Hence, the urban, together with the peri-urban zones represent a single functional urban area – the local labour market, as well as local residential market. This area, together with the rural hinterland zone, which performs predominantly recreational, nature conservation and food supply functions, constitute the *rural-urban region*.

Within densely settled, highly urbanized regions, the peri-urban zones of adjacent urban centres tend to touch upon one another, or mutually overlap, while the rural hinterland is shared among two or more urban centres; more exactly, their functional urban areas. This is the case of polycentric rural-urban regions. The outer reach of the rural hinterland is not explicitly determined. In those European countries which are characterized by fairly regular, hierarchical networks of urban places, the rural hinterlands make up for the balance of the national territory. In sparsely inhabited countries a separate category of rural, peripheral regions is usually distinguished. In policy terms, the outer limits of the rural-urban region can generally be considered as flexible, and adjustable to the emerging problems and evolving development goals.

The formation of spatial and functional structures characteristic of the rural-urban region is connected with the presence of a large urban centre (or centres), the population size threshold of which, however, may only be arbitrarily estab-

lished. In this respect, a crucial condition is development of a peri-urban zone around the urban centre. Hence, within the rural hinterland smaller urban places are normally interspersed among the typically rural areas. Whereas in the case of *urban* and *metropolitan regions* (Dickinson, 1964), or *regional settlement systems* (Dziewoński, 1986), functional interrelations at a regional scale are based upon economic linkages, social organization and migration patterns, the interdependence between urban and rural zones within the *rural-urban regions*, while taking account of the more traditional links, is reinterpreted so as to focus on the provision and consumption of ecosystems services which are utilized for both production and reproduction, including recreation purposes.

At a finer resolution level, the spatial morphology of rural-urban regions can be analysed using land use data from sources such as Corine Land Cover. In PLUREL these data were applied in delineation of the urban, peri-urban and rural sub-regions, as well as for the identification of areas characterized by dynamic land use change. Not surprisingly, the rapid pace of land use transition, as expressed by the growth in the share of artificial land surfaces within total land area, corresponds to the peri-urban zones of rural-urban regions.

The development of peri-urban areas, their transition from rural to mixed, rural-urban character, is an effect of the interplay of spatial concentration and deconcentration forces that operate at different territorial levels. Peri-urban development is not merely a new term denoting the spatial extension of suburban zones. While the latter are effects of territorial expansion of urban areas, the peri-urban growth actually reflects the fusion of urban and rural. Peri-urban areas are the in-between spaces, where the development of city-based activities meets the *in-situ* urbanization processes – the changing economic, cultural and physical characteristics of local settlements. This process is an outcome of urban deconcentration, as well as of transformation of rural areas, their functions and their cultural landscape. Still, the expansion of peri-urban areas, both in terms of population and economic activity, comes on account of inflows from both the urban core areas, as well as from the remaining components of settlement systems.

This transition, which is described as a multidimensional, a multilevel and a qualitative process (Rauws *et al.*, 2009), represents the combined outcome of a number of mutually interacting factors that are active over a short or a long time span. These factors were aggregated by L.S. Bourne (1980) into what he defined as alternative perspectives on urban deconcentration. The rapid development of peri-urban areas may namely be explained by referring to sets of economic, demographic, social, environmental, and policy-related factors.

In the category of economic factors reference is made to structural change – transition from industrial towards a service and information based economy (Clark and Kuijpers-Linde, 1994). The shifts among sectors take place as a consequence of changes in demand, in the organization of production, and of technological innovations. These shifts are accompanied by the evolving role of scale and agglomeration economies, as well as by major infrastructural improvements. New economic activities, in both manufacturing and service sectors, including advanced business services, chose locations in peri-urban areas, as these offer lower operational costs (land rent and land acquisition costs in particular)

in comparison with urban areas. These locational advantages of peri-urban zones are accompanied by a sufficient level of accessibility to markets, information and labour, as well as to public services, both the ubiquitous and the specialized ones.

Social factors that stimulate the development of peri-urban areas include the evolution of social values, changes in preferences and life styles, as induced by the decrease in family and household size, the growing affluence combined with income portability, and the increase in leisure time. These factors are paralleled by dis-amenities characteristic of urban areas, especially of large, older urban centres, which are associated with increased volume of immigration, ethnic segregation and social deprivation.

The environmental factors of peri-urban growth are closely related with the previous categories. The search for better living conditions which propels the out-migration of population from older urban areas, acts at the same time as a pull factor, attracting firms and institutions towards peri-urban locations. Working in high-quality environmental conditions is increasingly considered a premium, which more than compensates for costs and inconveniences caused by longer time spent in travel to work, and for the limited opportunities to combine various travel purposes within a single trip.

The expansion of peri-urban areas is also attributed to policy factors, more exactly to unintended, implicit public policy (Bourne, 1980; Markowski, 2009). Such tend to be effects of many sectoral policies in the domain of housing, transportation, taxation and public administration. Decentralization, delegation of planning competences and decision making power to local, self-governmental levels, tend to generally favour peri-urban development. Neo-liberal trends in policy making, lead to the enlargement of preferences given to active private sector interests, while leaving the external costs of investments to the public sector. These de-regulation trends are amplified by raising economic competition between cities, regions and states – an outcome of internationalization and globalization processes.

The mutual inter-dependence of economic, social and environmental factors of peri-urban development can also be interpreted as interaction between the *productivism* and the *environmentalism* related determinants of population migration and urban deconcentration (Berry, 1976; Geyer, 1996). The former refers to migration incentives that pertain to job opportunities, education and income, while the latter to those motives that focus on living conditions, i.e. the quality of life. In general terms, migration to the large cities, from rural areas and small urban places (as well as from lower-income countries), with an over-representation of young people among the in-migrants, falls into the *productionism* oriented spatial mobility, while the suburbanization moves, by families with children, as well as older adult persons, represents the *environmentalism* driven residential mobility pattern.

Once the natural environment quality becomes an important factor of economic and social development, it is the peri-urban zones that appeal to, and attract the two, above identified categories of migrants at the same time. These are the areas where the two types of spatial and social mobility incentives actu-

ally meet. This leads to the emergence of peri-urban areas as a new living and working environment, “a rapidly growing multifunctional territory, often with globalized industries, high mobility and transport dependence, fragmented communities and degraded landscapes” (Ravetz and Loibl, 2011, p. 30).

The inflow of people and of new activities, accompanied by the rapid land use transition, tend to impair the conditions and resources, including the proximity to open rural space, on which the attractiveness of peri-urban areas is founded. According to PLUREL results, the increase of land area covered by artificial surfaces is four times faster in the peri-urban, in comparison to the urban areas in Europe, which implies a doubling of this total land area in the next 30 to 50 years. These changes lead to augmentation and aggravation of conflicts between urban, agricultural, and nature-related societal values (Nilsson and Nielsen, 2011).

Hence the need and postulates that arise to put the current issues, and the future problems concerning the development of rural-urban regions in the focus of EU agricultural, structural and territorial cohesion policies, by targeting these policies towards peri-urban areas (Piorr *et al.*, 2011). It is asserted that cooperation across the urban-rural interface may lead to more efficient land-use planning, public service provision, as well as better management of natural resources (Nilsson *et al.*, 2009). Such goals imply the choice of a spatial policy perspective that departs from traditional divisions between urban and rural areas (as well as, between metropolitan and non-metropolitan areas), in recognition of the importance of urban-rural interdependence, of its role in the sustainable development of settlement systems and of space economy.

2. TYPOLOGIES OF EUROPEAN URBAN-RURAL REGIONS

2.1. Review and assessment of regional typologies¹

2.1.1. Early typologies of European urban regions

Contemporary typologies of European urban-rural regions are based on tradition that goes back to the 1970s. The early typological schemes were developed in the framework of international studies on cities and settlement systems, when attempts were made to delineate sets of comparable spatial units of reference. Such units, the functional urban areas, and functional urban regions, were defined so as to include cities together with the surrounding suburban and rural zones. Units of the former represent local residential and labour markets, while the latter – more extensive areas that are linked internally by both, work commuting and service, as well as business – related interactions.

The concepts of functional urban areas and functional urban regions have been widely adopted in research on urbanization processes and rural-urban relations in Europe. They have emerged in response to analytical, as well as planning and statistical needs. In such concepts, the basic limitations of the classical theory of urban networks are addressed: its static character, a point-like representation of urban areas, the inability to interpret the presence of clusters of urban-industrial centres, and the failure to explain the phenomena of suburbanization and peri-urbanization, including spatial decentralization of tertiary and quaternary functions.

During the 1970s there was a growing interest in international comparative research on cities and urbanization processes. The notion of the European Urban System, at that time introduced into the professional literature (Hall and Hay, 1980), was initially used as an anticipatory concept, a counterpart to the notion

¹ An earlier, extended version of this review appeared in *Geographia Polonica*, vol. 81, 2, pp. 25–42.

of the American Urban System (Berry, 1973). So were the concepts of functional urban regions and of functional urban areas – the counterparts to American metropolitan regions and metropolitan areas (Shryock, 1957), respectively.

Two major international comparative urban research projects, conducted in the late 1970s were based upon data for large sets of European cities, yielding their classifications and typologies. Reference is made here to the CURB project – on Costs of Urban Growth, sponsored by the Vienna Centre for Social Studies, and to the FUR (Functional Urban Regions) project, carried out at the International Institute for Applied Systems Analysis. In the former project, which involved research teams from a number of countries, cities and urban regions in Europe were *i.a.* analyzed within the framework of the concept of stages of urban development (Berg, van den *et al.*, 1982), ranging from absolute, and then relative centralization (the phases of urbanization), to relative and then absolute decentralization (suburbanization), leading to des-urbanization, and, subsequently, to re-urbanization. This approach was later extended by H.S. Geyer and T.M. Kontuly (1993) into the concept of differential urbanization, one pertaining to the interregional and national scales.

The second project was based on the concept presented by P. Hall (1973). It consisted of an extended comparative study of several densely-populated and highly-urbanized world regions, sometimes referred to as megalopolises. The study was expected to focus on the changing distribution of people and jobs (especially in terms of their concentration and deconcentration), occupational structure, the journey-to-work and land-occupancy patterns, and to lead to generalized social indexes for urban areas, as well as indicators measuring the efficiency of the use of resources, particularly the land. The identification of comparable spatial units of reference was seen as an essential first stage in the analysis.

For the purposes of that project a working definition of Functional Urban Regions was formulated, and the range of the study extended to cover a number of European, as well as some other countries, including the United States, Canada and Japan. The regions were defined as consisting of urban cores, basically corresponding to cities of 50,000 inhabitants and over, and their spatially contiguous hinterlands, delineated so as to ensure a high degree of closure of employment and residence within the regions. The criteria adopted allowed the substitution of alternative measures of spatial integration, such as central-place linkages, for the missing commuting data. At a later stage of the study the FUR definition was modified, in that core cities were combined with their commuting fields to form functional urban cores, while hinterlands were delineated on the basis of commodity, migration, and information flows and/or administrative criteria. When such a definition did not yield an exhaustive division of the national territory, the balance was considered to be the rural area. It was maintained that the establishment and use of the comparative spatial framework should provide a better understanding of the impacts of public policies in the fields of population distribution and economic development. However, owing to the paucity of spatially disaggregate data on employment, income and production, the scope of comparative analysis was basically restricted to a study of interregional and intraregional population shifts (Korcelli, 1982).

Subsequently, from what was initially a study of population redistribution between cores and rings of metropolitan areas, the focus of comparative studies of European urban regions shifted towards an analysis of their economic structure and performance. For a set of West European cities, P. Cheshire and D. Hay (1989) identified a link between population decentralisation and desurbanisation on the one hand, and deindustrialization on the other. They portrayed this as a trend spreading from cities of Northern to cities of Southern Europe during the 1970s and the 1980s. (In the 1990s, it became an even more visible trend, and, in fact, a critical issue in cities and urban regions of Central and Eastern Europe). In the light of the analysis, specialisation in industry was found to correlate positively with poor economic performance, as well as population decline. The successful urban regions have generally been those with strong traditions in the service sector, once this is enhanced by growth in modern, specialized service activities.

The advent of political and economic changes in Central and Eastern Europe has led to renewed interest in Europe-wide classifications and typologies of urban regions, as new trade routes have opened up since the early 1990s, and plans were drawn up for the extension eastwards of the main European transportation corridors. Hence, some of these classification schemes have been based upon current statistical indicators, while others present projected or even desired future patterns. Among numerous studies, the contribution by R. Brunet (1989) is perhaps the most frequently referred to. His division of European urban agglomerations into eight classes is based on synthetic scores derived from 16 indicators giving preference to the international range of functions. In another well-known study, a map of the European Urban Network (1994), several categories of urban regions are distinguished, including *urban regions of potential European importance* – mainly focusing on the capital cities of the Central and East European Countries.

A different approach was followed by P. Treuner and M. Foucher (1994) in their book: *Towards a New European Space*. The authors identified three basic categories of urban regions, each divided into sub-categories. The latter correspond to a large extent to anticipated stages in the enlargement of the European Union. The study sought to provide a point of departure for discussions over spatial development targets and the possible allocation of EU structural funding.

2.1.2. The ESDP and the ESPON programme

The significance of the notion of the *urban-rural partnership* in European spatial policy debates is due to the European Spatial Development Perspective (ESDP 1999), a document adopted by the Informal Council of Ministers responsible for Spatial Planning. The ESDP considers the urban-rural partnership under the heading of the broader topic of polycentric spatial development and a new urban-rural relationship, among the policy aims and options for EU territory. Specific options, particularly relevant in the context of the PLUREL project, include integrating the countryside surrounding large cities into the spatial development strategies for urban regions, aiming at more efficient land-use planning, paying

special attention to the quality of life in the urban surroundings, and promoting company networks between small and medium-sized enterprises in the towns and countryside (*ibid.*, pp. 25–26).

While no formal typology of urban-rural regions is provided in the ESDP, the differentiation in urban-rural relationships is emphasized and identified, among other things between high- and low population density regions, as well as along a spatial scale dimension; from the regional to the supraregional, inter-regional and transnational perspective. More insights are provided by what Christer Bengs (1999) calls the research for the ESDP – the contribution made by academia to the ESDP process.

A genuine regional typology oriented towards rural-urban relations has been elaborated in the *Strategic Study Towards a New Rural-Urban Partnership in Europe*, carried out under the Study Programme in European Spatial Planning (CGS, 1999). The main objective of the Study was to identify the major issues underlying the interdependence of urban and rural areas in Europe. The analysis was based on 36 case study regions in 14 EU countries (the EU-15 excluding Austria). The types of region defined *a priori*, include: Metropolitan areas, Polycentric areas, Urbanised rural areas, Deep rural areas and Peripheral areas.

For regions in each category the analysis concentrated upon six aspects to urban-rural relations, i.e.: (a) Settlement structure and accessibility of infrastructure, (b) Diversification of the economy, (c) Territorial impacts of structural change in agriculture, (d) The conservation and enhancement of natural heritage, (e) The role of cultural heritage, and (f) Cooperation between rural and urban authorities at the local administration level.

In the case of *Metropolitan areas*, the main issue concerns urban sprawl, with the conflicts it generates due to competition between urban and rural land uses, as often aggravated by the deficiency of planning and policy regulations. Problems in the *Polycentric areas* are basically similar to those occurring in the *Metropolitan areas*, with additional questions concerning the pressure on infrastructure on the one hand, and competition rather than cooperation between individual centres on the other, the latter reflecting the lack of a common regional identity. In the *Urbanized rural areas*, i.e. regions with rather traditional urban networks, difficulties occur in preserving intense relations between individual small and middle-sized cities, and in modernization of their economic bases. This problem also brings negative effects to the intermediate rural areas. On the positive side is the overall high quality of the natural environment, and of the cultural milieu, of the regions in question. Finally, the *Deep rural areas*, and the *Peripheral areas* are strongly negatively affected by population ageing and depopulation trends, with consequent shrinkages of local economies, including as regards the provision of services. Assets of such regions pertain to their role in safeguarding the natural and cultural heritage, and in sustaining biodiversity on the European scale.

Results comparable to those presented above can be found in another contribution to the Study Programme in European Spatial Planning. They are summarized in a report by Denise Pumain (1999). In this case the regional typology was arrived at *ex post*, on the basis of cluster analysis while using several indica-

tors of rural-urban settlement pattern. These measures included: urbanization rate, rural and urban population densities, average spacing of towns with over 10,000 inhabitants, an index of inequality in towns' sizes, a city primacy index, and population size category of the main urban centre. The analysis was carried out for 728 regions at NUTS-3 level, the work resulting in the identification of the following five categories: (a) Regions dominated by a large metropolis, (b) Polycentric regions with high urban and rural population densities, (c) Polycentric regions with high urban population densities, (d) Regions characterized by networks of medium-sized and small towns, (e) Remote rural areas. It is suggested in the conclusions that such a methodology could also be applied at a lower spatial scale, i.e. the NUTS-5 level.

A number of functional criteria were used by S. Conti and C. Salone (1999) in their contribution to the study on: *Typologies of cities and rural-urban partnership*. As the authors argue, in the context of multi-centre and network urban structure, functional criteria are more relevant than the physical (morphological) ones, since they make it possible to identify a hierarchy in the urban system. The variables selected to represent the *functional endowment* of individual regions pertain to economic leadership, financial sector, research, education, communication, tourism and culture. Using the case of Italy – a system of labour market areas covering the whole national territory – they distinguished three main types of urban systems (interacting regions): (a) polarised (metropolitan and non-metropolitan) systems, (b) equipotential (balanced) networks of three levels, (c) hierarchical networks. The authors observe that regions characterized by a balanced urban network tend to perform the function of *territorial integrators* between the major metropolitan areas on the one hand, and the predominantly rural areas on the other.

The introduction of the hierarchical system of NUTS units and, subsequently, the establishment of the ESPON (European Spatial Planning Observation Network) Programme have opened up a new stage, by multiplying the effort and increasing general interest in international comparative urban and rural-urban studies. Questions pertaining to regional typology have been present in a number of individual ESPON projects. The most relevant results, from the perspective of the present contribution, are found in ESPON 1.1.1: *The role, specific situation and potentials of urban areas as nodes in a polycentric development*, in ESPON 1.4.3: *The study on urban functions*, and in ESPON 1.1.2: *Urban-rural relations in Europe*.

The ESPON 1.1.1. project identified and delineated spatial units of: the *Functional Urban Areas* (FUA), the *Metropolitan European Growth Areas* (MEGA), the *Potential Urban Strategic Horizons* (PUSH), and the *Potential Integration Areas* (PIA).

A more detailed definition of European Functional Urban Areas (EFUA) was developed within the framework of the Study Programme in European Spatial Planning (Pumain, 1999). For the project's purposes it was assumed that a Functional Urban Area consisted of a core municipality (or a cluster of municipalities forming an urban agglomeration), and commuting area – typically an aggregation of NUTS-5 units. For most countries, these areas were delineated according

to specific, national definitions. For 11 countries in which data on travel to work are not available, delimitations were carried out by individual country experts on the basis of their knowledge of spatial functional relations. These definitions varied, and the authors of the report have admitted that the selection and boundaries of FUAs were not totally comparable across Europe. As to the number of Functional Urban Areas identified, the differences among the countries covered in the analysis (in the ESPON space, i.e. in 27 EU members plus Norway and Switzerland) do not necessarily reflect variations in the structural characteristics of urban settlement. This is an important issue, since the FUAs comprised the basic units on which most of the further analysis conducted within the project, for example the measurement of polycentricity, was performed.

The identification of MEGAs (Metropolitan European Growth Areas) was based on the typology of Functional Urban Areas. The criteria used were: population size (the lower boundary was set – with exceptions – at 500,000 inhabitants) and high-rank functions in the domain of transportation, manufacturing, higher education and decisionmaking in both the public and private sectors. National capitals were all included by definition. A total of 76 MEGAs, i.e. FUAs with the highest total scores, have been identified, and, based upon more specific criteria related to the importance of their functions, divided further into five categories. These results have often been questioned; nevertheless, the list of MEGAs originating from the ESPON 1.1.1 project has become a standard reference in both urban research and spatial policy analysis across Europe.

The two remaining categories of urban regions, i.e. the *Potential Urban Strategic Horizons* (PUSH) and *Potential Polycentric Integration Areas* (PIA) were designated with a view to the identification of areas characterized by a high density of urban settlement, in which integration of neighbouring FUAs could generate a further concentration of population and economic activity. The first step in the analysis was the delineation of PUSH areas including all municipalities (normally NUTS-5 units) in which at least 10 percent of the area can be reached within 45 minutes from an FUA centre by car. The number of PUSH areas is the same as the number of Functional Urban Areas, but PUSH areas of neighbouring FUAs can overlap. In the second step, Potential Polycentric Integration Areas (PIA) were identified and delineated by merging the PUSH areas of neighbouring urban centres in those cases, in which a smaller centre shared at least one-third of its PUSH area with the larger one. Each PUSH area belongs to one PIA only, and multiple tiers of integration can occur within a single PIA. Neighbouring PIAs can overlap (ESPON 1.1.1, 2004, p. 24).

The settlement pattern for each PUSH area was analysed (on the basis of Corinne Land Cover data) from the point of view of spatial concentration. The four types of PUSH area distinguished were: (a) monocentric, (b) polycentric, (c) sprawl, (d) sparsely populated (rural).

Each PUSH area was allocated to one of these categories. No correlation was found between the degree of polycentricity or monocentricity of urban areas and their capacity to integrate at the PIA level.

Unlike in the case of FUA and MEGA, the PUSH and PIA systems have attracted relatively little attention in both research and planning. This is due to disput-

able aspects of their definitions. First of all, it was not realistic to assume that all FUA centres, including the smallest ones, can extend their zones of influence over the whole area situated within the 45-minute travel time isochrone. If clusters of PUSH and PIA areas were to form magnets for further concentration of economic and demographic potential, they would have to be based upon the network of large cities offering real attracting power in terms of the labour market and the range of specialized services. Secondly, the identification and typology of the PIA areas (276 in total) has produced a number of contestable outcomes. As a consequence of the adoption of specific delineation rules, some *de facto* middle-sized cities have emerged as main cores of huge urban regions with several million inhabitants in total. Thirdly, the European patterns of PUSH and PIA areas mainly reflect variations in the overall density of urban settlement. Countries with high population densities are almost completely covered by the PUSH and PIA regions. This says little about the structure of the settlement system – the hierarchy and actual range of influence of urban centers over urbanized, as well as non-urbanized territory.

The main goal of the ESPON 1.1.1 project was to identify areas of high urban, economic and population concentration in the European Union, which could in future develop into the so-called Global Integration Zones – potential counterweights to the dominant European core region – the Pentagon. This goal followed on from assumptions and postulates formulated in the European Spatial Development Perspective (ESDP, 1999). Hence, spatial structure, with the emphasis on the question of polycentricity, was mostly considered under the project at national and macroregional levels, rather than on the mesoregional (urban-rural region) or local (city) scales. Nevertheless, the materials accumulated in the project, as well as its results have proven very important for any subsequent research on the distribution, structure and typology of urban and rural-urban regions in Europe.

Such a subsequent effort was undertaken under the ESPON 1.4.3 (2007) project on: *The study on urban functions*, this attempting to modify and further develop the concepts and indicators elaborated within the framework of the ESPON 1.1.1 project. One of these developments concerned the internal structure of the Functional Urban Areas. While sustaining the general idea of the FUA as a city (or cities) together with its/their labour-commuting shed, the ESPON 1.4.3 study introduced an alternative definition, and a measure of the FUA core area, i.e. the *Morphological Urban Area* (MUA).

Unlike in the previous project, where FUA cores are identified with cities, or clusters of cities (urban agglomerations), here they are defined as continuously urbanized areas – clusters of contiguous communities, irrespectively of their administrative status, characterized by high population density. Such a definition, it is claimed, is important from the point of view of FUA typology. In the case of FUAs of the same population size, the one having a stronger MUA at its core, especially when characterized by a high quality of historical and cultural heritage, has clear ascendancy. In large, densely-populated, highly-urbanized regions, the rule of spatial continuity of the MUA cannot be retained. Hence, secondary MUAs are distinguished, with their own commuting sheds, but still forming

parts of a major FUA. Four types of such urban regions have been recognized by the authors, as illustrated by: a hypothetical urban cluster situated in a large coal basin area (Type 1); the Ile-de-France region, with new towns dependent upon Paris (Type 2); the Belgian central metropolitan region with Brussels, and Antwerp as a major secondary centre (Type 3); and the London metropolitan area with the belt of important, functionally specialized centres (including Cambridge and Oxford), and a second belt of urban centres situated at the fringe of the London FUA (Type 4).

A regional typology, one explicitly pertaining to urban-rural interdependence, has been constructed within the framework of ESPON 1.1.2 (2004) project on: *Urban-rural relations in Europe*. These relationships are registered in two dimensions that pertain to the level of urban influence upon rural areas, and the intensity of human intervention. Six types of regions (NUTS-3 units in EU 27+2 countries) were identified, scaled along the urban-rural gradient – from the ones characterized by a marked urban influence and high level of human intervention (typically, though not exclusively, the areas containing large cities), to those featuring limited urban influence and a low level of human intervention (typically – peripheral and mountainous regions). Hence, the individual types of regions are defined by:

- high urban influence and large-scale human intervention
- high urban influence and medium-scale human intervention
- high urban influence and small-scale human intervention
- limited urban influence and large-scale human intervention
- limited urban influence and medium-scale human intervention
- limited urban influence and small-scale human intervention.

The degree of urban influence was defined by referring to population density and the rank of the main urban centre. Regions, i.e. individual NUTS-3 units characterized by high level of urban influence are those in which population density exceeds the European Union average, and/or where the main urban centre belongs to the MEGA (Metropolitan European Growth Area) category. All the remaining units were classified as featuring low, i.e. limited urban influence.

The scale of human intervention was determined on the basis of land use structure, i.e. the shares of artificial surfaces, agricultural areas, and residual land categories within the total land area, calculated according to CORINE Land Cover data. The large-scale or high human intervention category consists of those NUTS-3 units in which the share of artificial surfaces is above the EU average. Units with above-average share of agricultural land are included in the medium-scale human intervention category, and those exhibiting above-average percentages of only the residual land class (most of which is woodlands and forests) – in the low, or small-scale human intervention category.

According to the established criteria, more than half out of the total number of NUTS-3 units are found in type 1, i.e. among the areas characterized by high urban influence and large-scale human intervention (these units account for 19 percent of the total land area in the EU 27+2 countries; and for 60 percent of the total population). This suggests its somewhat over-inclusive character. Nonetheless, regional type 1 can be interpreted as grouping the highly urban-

ized areas, even though its boundary criteria – the population density of more than 107 persons per square km, and the share of artificial surfaces in the total land area of at least 3.5 percent, are relatively low values when seen from the perspective of many individual European countries.

One of most interesting, and policy relevant findings of the study here referred to, is stability of the share of agricultural land in the total land area, which is an attribute of all types of regions, regardless of the size of the main urban centre. In a number of NUTS-3 units a high share of agricultural land is found to coincide with a high share of artificial surfaces. This indicates that even in highly urbanized regions of Europe agriculture remains an important function, one strongly integrated with other sectors of economic activity (Bengs, 2005, p. 231).

2.1.3. Other selected international studies

As a rule, international studies on urban and urban-rural regions involve attempts to identify comparable spatial reference units. In the GEMACA project focusing on the international competitiveness of 14 metropolitan areas in North-Western Europe, such units (Functional Urban Regions) were defined as consisting of an economic core, with employment density of more than 7 jobs per ha, and neighbouring municipalities in which more than 10% of the active population commute to work to the core. Types of urban regions were related to their functional profile (Cheshire and Gornostaeva, 2002).

Changing functional and spatial relations (business decentralization, service network flows) in urban regions have also been studied under the POLYNET project, within the framework of the Interreg III B programme. It focuses on eight European Mega-City regions: South East England, Belgian Central region, Rhine-Ruhr, Rhine-Main, Northern Switzerland Metropolitan Region, the Paris region and Greater Dublin. These areas are again defined as Functional Urban Regions (FUR) that are neither administrative nor morphological units (Hall, 2004), but have been delineated on the basis of daily commuting flows.

Two major projects under the EU 5th Framework Programme, namely SCATTER (Batty *et al.*, 2002) and URBS-PANDENS (Couch *et al.*, 2007) focused on urban sprawl, a phenomenon which has received extensive coverage in the literature. Urban sprawl has a considerable impact on both settlement forms and functions. It is among the most characteristic contemporary features of the peri-urban and rural zones of urban regions. Materials collected, methods of analysis used, and generalizations arrived at by the two project teams have to be referred to in any attempt at the typology of rural-urban regions and the study of urban-rural interaction. One such generalization is the identification of four types or profiles of urban sprawl: (a) Sprawl as an emergent polycentric region, (b) Sprawl as scattered suburbs, (c) Sprawl of peripheral fringes, (d) Sprawl forms of commercial strips and business centres. Six case-study regions were analysed: Brussels, Rennes, Helsinki, Milan, Stuttgart and Bristol, each subdivided into a number of territorial units (from 135 in the case of Brussels to 489 in the Helsinki region). These were in turn aggregated into three main zones: of the urban centre, outer urban ring, and hinterland (Haag and Binder, 2002).

D.L. Jaquinta and A.W. Drescher (2000) have proposed an extended definition of the peri-urban component of the urban-rural region, or of the rural-peri-urban-urban system. They assume that, in terms of migration in particular, the peri-urban environments play a mediating role between rural and urban areas. Such environments are places of dynamic social change. Using this perspective, the authors have developed a conceptual typology of peri-urban areas, consisting of the following forms: (a) Village peri-urban, (b) Diffuse peri-urban, (c) Chain peri-urban, (d) In-place peri-urban, (e) Absorbed peri-urban.

Regional typologies are developed for both analytical and policy-related purposes. As Denise Pumain (1999) put it aptly, a good knowledge of regional variations in types of rural and urban settlement is required for the implementation of spatial policies: to be efficient, the policies should be adapted to specific local conditions. This is especially so when such policies are designed and applied at an international level, in this case that of the European Union, with its highly-differentiated patterns of human territorial occupancy, and varying spatial economy.

2.1.4. Towards a general typology of urban-rural regions

Construction of a regional typology requires a comparability of spatial units of reference. This is achieved by aggregating and disaggregating the territorial units for which statistical data are normally collected. As pointed earlier in this review, attempts to identify common sets of spatial units – basic building blocks used in the analysis of urbanization patterns and urbanization processes in Europe, go back to the 1970s. Typical difficulties encountered in such projects stem from: (a) differences among national definitions and criteria of identification of cities and urbanized areas, (b) heterogeneity of urban settlement patterns, related to variations in overall population density, urbanization level, historically developed settlement forms, (c) non-uniform availability of data. These problems and limitations pertain to typological studies as well, and have only been partly ameliorated by the establishment of the NUTS system and the accumulation of data for these spatial units. Since total comparability at an international scale would not be a realistic objective, the question remains whether the comparability level actually achieved in a given study is satisfactory from the point of view of its specific research goals. In the case of typological studies at least, the existing data gaps, such as non-availability of commuting-to-work data for a number of countries, is seen as a more important problem than the imperfect standardization of spatial units of reference.

Another question pertains to concepts of the region that stand behind individual regional typologies. These concepts have much in common, but they also differ in some respects that are rather crucial from the perspective of the individual research project. One of these differences relates to the spatial extent of the region, usually identified with the range of the commuting zone. While it generally includes the suburban and peri-urban areas, it may, or may not, extend into the exurban (i.e. rural) settlements, from which commuting tends to be less intense. The farthest-reaching in this respect is the concept of the *metropolitan*

region, according to which zones of influence of metropolitan centres cover whole national territories. These centres correspond in fact to central places of the highest order in Christaller's theory, wherein the rule of exhaustive territorial coverage by the respective market areas also applies. Most of the concepts, however, including ESPON's Functional Urban Areas, depict urban regions as "islands", with rural, and less intensely urbanized areas situated in between. Still another model approach – followed by the US Bureau of Census – involves a dichotomous division of the territory into metropolitan and non-metropolitan areas.

Interdependent with this question is the problem of functional linkages between the constituent parts (zones) of urban and urban-rural regions. In their simplified forms (such as the FUA), the urban core is presented as the locus for workplaces and services, the rest of the region as a mainly residential and labour-providing area. Conversely, the concepts of *metropolitan community* and *urban field* represented early attempts to include such dimensions of interdependence as common identity and interests on the one hand, and multilateral circulation patterns on the other. More recently, however, large urban centres have been shown to be increasingly involved in global and continental networks of interaction (Taylor, 2003), at the cost of a weakening of their ties with their surrounding regions. Here we may stress the role of the PLUREL project in analysing the interdependence between various forms of land use in urban-rural regions, and in forecasting their future patterns.

The existing typologies of urban and urban-rural regions are based primarily on functional criteria, since functional profile and specialization are the main factors determining the role and position of individual cities and their surrounding areas within respective national and international urban systems. Integrated with the functional criteria is a measure of mass, or overall potential, conventionally measured in terms of population size, but also by the GDP volume, as well as the political and administrative functions performed. Among other measures of functional competitiveness, the aggregate spatial accessibility within the given territorial system comes to the fore.

The second category of typological criteria relate to the morphology of settlements. Their roots are found in historical studies of spatial patterns – shapes of rural villages (Maitzen, 1895; Szulc, 2002), in town planning studies (Abercrombie, 1933; Dziewonski, 1962), and in urban social ecology (Park *et al.*, 1925). These traditions have never been integrated into a comprehensive concept of spatial morphology of rural-urban regions, even though they refer to common topological notions such as linearity, density, polycentricity etc. Following this approach, S. Marshall (2005) elaborated a detailed, comprehensive review of urban spatial patterns.

A general interdependence between morphology and economic performance among cities and regions has never been proven, but it is typical to observe straightforward relations between spatial patterns of settlement and such indicators as energy efficiency, or the share of public transportation in the total volume of traffic.

Still another approach to the typology of urban-rural regions refers, though usually implicitly, to the concept of rural-urban dichotomy and the rural-urban

continuum (Wirth, 1938; Pahl, 1965). Here individual settlements (in this case regions) are placed on the scale from the purely rural to totally urban (or large urban), with mixed, or transitional forms in between. The typological criteria applied refer to such variables as density of urban and rural populations, population change, the size and distribution (spacing) of towns and the dominance of the main urban centre. All these forms and their indicators, however, are subject to change, as the integration of urban and rural settlement progresses, along with the growing integration of the urban and rural economies. This points towards a generally neglected dimension to urban and rural typologies, i.e. their prevalingly static character.

Regional typologies that focus on interactions between constituent parts of rural-urban regions, i.e. the urban, peri-urban and rural zones, are generally underrepresented. This is true, even though some earlier studies (Berg, van den *et al.*, 1982) attempted classifications based upon patterns of intraregional population redistribution, referring to the concept of stages of urban development. One should agree with D. Pumain (1999) again, in that – for a proper assessment of the rural-urban partnership – it is necessary to rely on information concerning flows of goods, persons, capital and information (not just travel to work, but also residential mobility, consumption of urban services, utilization of recreational areas, etc.). Yet, such data on rural-urban relationships are scarce, and usually have to be generated within the framework of especially designed research projects. In an attempt at a synthesis, one can distinguish several categories of typological criteria based on different concepts of rural-urban regions. These sets of criteria, some of them in combination, lead to alternative classes of rural-urban typologies.

At this point the question to be posed concerns prospects for the development of a comprehensive typology of rural-urban regions. Such an outcome in fact looks unlikely. Individual classes of regional typologies stem from various concepts of urban and rural-urban regions. They also relate to different spatial scales, from the transnational and national through to the interregional and intraregional, and in consequence to different levels and goals of spatial policy.

To summarize the present review, among the existing typologies of urban-rural regions the following categories can be distinguished:

a. Typologies of regions in which the rural, and often also the peri-urban zones are identified with the commuting shed of the main urban centre (or centres, in the case of polycentric regions), while their role is interpreted in terms of endogenous residential and recreational functions. The typological criteria adopted are primarily related to functional profile, with inclusion of measures of population size and political and administrative status. The structure of such typologies tends to be hierarchical, with links to the urban-systems hierarchy at national and international levels. This category of typological studies involving urban-rural regions is the one most frequently represented in the literature.

b. Regional typologies based on criteria of urbanization level, i.e. the degree to which the character of a given area is urban vs. rural. The scale adopted extends from the metropolitan through to the rural or deep rural areas. Hence, the regions identified are in a sense homogeneous, as they do not represent the

typical structure of an urban-rural region, composed of the urban core, the peri-urban and rural zones. In addition to the level of urbanization, such typologies tend to include criteria related to morphology of settlement and to patterns of spatial redistribution of population. They may be outlined at an introductory phase of research, in order to select case-study regions, or to evaluate the distribution of the case studies that have been identified on an *a priori* basis.

c. Typological studies of rural-urban regions which focus on the interdependence of, and interaction between, the urban, peri-urban and rural parts of the region. Since this interaction is a complex phenomenon, attention may focus on its specific aspects, such as migration, land-use change, redistribution of economic activity, institutional linkages related to planning and policy, etc. Typologies of this kind are rather rare, owing to the exacting data requirements, in particular with regard to flow data. They tend to be developed at a later stage of a research project, rather than in its initial phase

The scope of research on regional typologies is quite broad, as different typological approaches correspond to alternative concepts of rural-urban regions, as well as to varied research needs and objectives. Hence, the elaboration of a comprehensive, all-purpose typology of European rural-urban regions would not be a realistic goal. At the same time, the usefulness of regional typologies, as both analytical and spatial policy tools can be emphasized.

2.2. PLUREL typologies of rural-urban regions

Several typological studies of urban and rural-urban regions were undertaken in the framework of the PLUREL project. These studies provided points of reference for the subsequent analyses of interdependence between land use and socioeconomic change. It was assumed that this relationship, while exhibiting some general pattern over space and time, is subject to specific variations which are attributable to functional, morphological and demographic characteristics of individual urban and urban-rural regions. Hence, attempts were made to generalize and contract these characteristics into a limited set of regional types.

One of the studies (Korcelli and Kozubek, 2007) focused on functional urban areas, as defined and delineated for the purposes of the earlier quoted ESPON 1.1.1 (2004) project. A subset of 121 FUAs were selected for the analysis, namely the ones that contained urban centers of at least 400,000 inhabitants within city administrative boundaries. The commuting fields which made up for the balance of the respective functional urban areas, included suburban and peri-urban zones, some of predominantly rural character. In general, however, rural hinterland zones remain beyond intensive daily interaction focusing on urban centres. Hence, functional urban areas can only be identified with the inner (albeit, in most instances major) parts of urban-rural regions (Fig. 2.1).

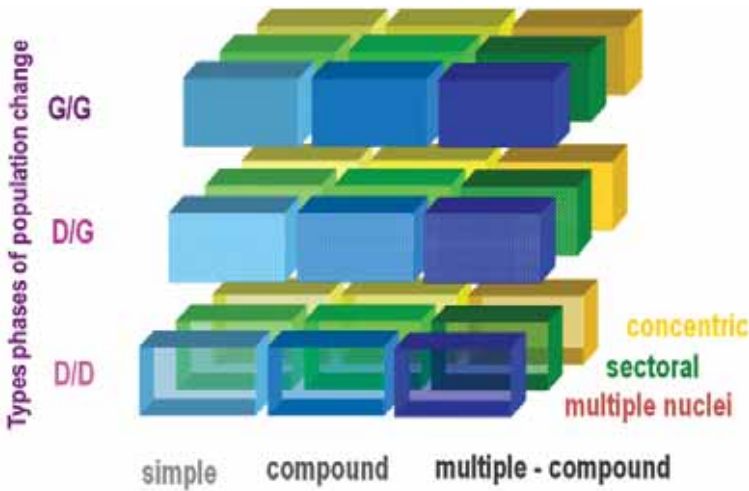


Figure 2.1. The three-dimensional regional typology
 Authors' own elaboration (refers to all figures and tables unless otherwise given).

The typological criteria selected for the purpose of this study pertained to spatial structure of settlement and trends in population redistribution between cores and rings (i.e. urban and peri-urban zones) of the functional urban areas. The functional profiles, i.e. the range and specialization of functions performed, were not included at this stage of analysis. The latter indicators, which in fact constitute the basis for many urban and regional classifications and typologies, tell relatively little about relations between the constituent parts of the regions. On the other hand, settlement morphology comprises an important dimension in the study of transportation and mobility, as well as of land use change in urban and rural regions, the topics on which several major research tasks in the project have focused.

The observed forms and patterns of human settlement are represented by a number of morphological types (Marshall, 2005). In this study reference is made to the classical models which belong to the core of the general theory of urban spatial structure (Korcelli, 1982). These are: the concentric zones model by E.W. Burgess (1925), the sectoral model of H. Hoyt (1939), and the multiple nuclei model introduced by Ch.D. Harris and E. Ullman (1945). The traditional concepts are supplemented by the concept of K. Dziewoński (1962) who pointed at an important morphological feature of settlement, namely its growing complexity along with the enlargement of spatial scale. Three basic types of settlement forms were distinguished by Dziewoński, corresponding to the successive complexity levels, namely: the simple, compound and multiple compound patterns. This gradation of pattern complexity pertains to settlement structure in general, including those spatial forms that were depicted in the classical urban models referred to above. In other words, the models in question can be transferred from a higher to a lower resolution level, i.e. from the scale of a single city to a function-

al urban area scale. At this latter level the concentric zones, sectoral, and multiple nuclei patterns can be interpreted as representing monocentric, linear, and polycentric structure, respectively.

In addition to morphological criteria, spatial patterns of population change are considered in the present typology. This important aspect of intra-regional relations is dealt with by making reference to the concept of stages of development of an urban region, in the version outlined by P. Hall and P. Hay (1980). The model in question presents a sequence of six phases of population redistribution, from the phase of absolute centralization, when population of the main urban centre increases at the expense of the remaining parts of the region, to the phase of de-urbanization, when both the main city and the urban region as a whole experience population losses, and further to the phase of re-urbanization, when new impulses of economic growth, together with changes in life styles and demographic trends, bring a renewed migration inflow to the urban centre.

For the purpose of the present typology this scheme has been simplified, by reducing the number of phases from six to three. The first phase, one of population concentration, pertains to a situation in which population growth occurs both in the region as a whole, and in its urbanized core. In the second phase of the cycle population deconcentration takes place, i.e. an increase of population in the region is accompanied by a decrease in the core. In the third phase, one of population decline, the number of inhabitants decreases both in the urbanized areas, and in general, at the region's scale. It is important to note that, in accordance with the ESPON definitions, the cores of functional urban areas are composed of all urban municipalities, either occupying a contiguous territory, or situated at a short distance from the main city.

Such a sequence of phases of population redistribution tends to coincide with the shift, from positive to negative demographic change at a national, and supra-national level, and with progressive population ageing, the phenomena that are associated with the so-called second demographic transition. The course of this transition, however, and its impact upon spatial population change, are far from uniform across Europe. It is therefore justified to assume that within the set of urban regions various phases of population redistribution may be found to occur synchronically, i.e. in a single time period under analysis.

Relations between the three alternative models of spatial structure of settlement, and the three levels of the structure complexity (which to some extent account for differences in the size of urban regions) as well, as the three phases of spatial population change have been arranged into a three-dimensional scheme (Fig. 2.1). This scheme was used in the typology of the functional urban areas. Their allocation into the respective categories of spatial structure, as well as of the classes of settlement pattern complexity, was based, following expert judgment, upon analysis of cartographic sources and satellite images, including topographic maps and Corine Land Cover data. The phases of population change were determined by using data for the years 1996 and 2002, borrowed from the ESPON statistical base.

Concerning the degree to which it was filled out, this typological scheme has proved to be quite effective. Only three out of the total of 27 cells remained empty;

this share can be evaluated as rather low, in the situation when the number of objects (functional urban areas) exceeded the number of potential typological categories by less than 4.5. The empty categories include the types of regions characterized by simple, sectoral (i.e. linear), and multiple nuclei (polycentric) patterns of settlement morphology as well as population decline; and also the type of regions with simple, polycentric settlement pattern and population gain, both in the core and in the region as a whole. In fact, the allocation to different levels of morphological pattern complexity of those functional urban areas which exhibited polycentric settlement structure turned out to be somewhat problematic. It is namely an open question whether such spatial structure could at all be qualified as "simple morphological pattern". A negative answer would imply the reduction of the number of potential typological classes, from 27 to 24.

Bearing in mind the above reservations, as well as some arbitrariness related to the application of qualitative, rather than quantitative criteria for the identification of settlement patterns, it was possible to arrive at the following typology of the functional urban areas:

- Type 1. Regions characterized by compound, and multiple-compound spatial structure which is dominated by sectoral (linear) settlement patterns; areas with growing population numbers, both in the region and its core. This, the most numerous category is represented by 31 out of the total of 141 functional urban areas included in the analysis. Many of these areas contain coastal urban agglomerations. Examples are the FURs of Stockholm, the Hague, Helsinki and Valencia (Fig. 2.2).
- Type 2. Regions of prevailing monocentric structure with compound, or multiple-compound patterns of settlement; areas featuring positive population change both in total and within the urbanized core. This subset contains 22 units, among them numerous middle-sized and some large national and regional capital cities, such as Montpellier and Warsaw.
- Type 3. Regions characterized by prevailing sectoral (linear) settlement structure of compound character as well as by population decrease, either within the core only, or in both the core and the region as a whole. There are 17 functional urban areas in this category, including Liege, Duisburg and Geneva.
- Type 4. Polycentric regions of compound, or multiple-compound settlement patterns, exhibiting population increase in general, as well as within the urbanized core areas. Among 15 areas allocated to this category are: Stuttgart, Zurich and Utrecht.
- Type 5. Regions of monocentric, simple and compound settlement structure, with population decrease, either in the core only, or at the region's scale. This category contains 14 functional urban areas, among which are: Budapest, Poznań and Leipzig.
- Type 6. Functional urban areas of multiple-compound, monocentric or polycentric structure of settlement, areas featuring negative population change in general, or in the core parts only. There are 10 units in this class, including, among others: Katowice (Upper Silesian conurbation) and Birmingham.

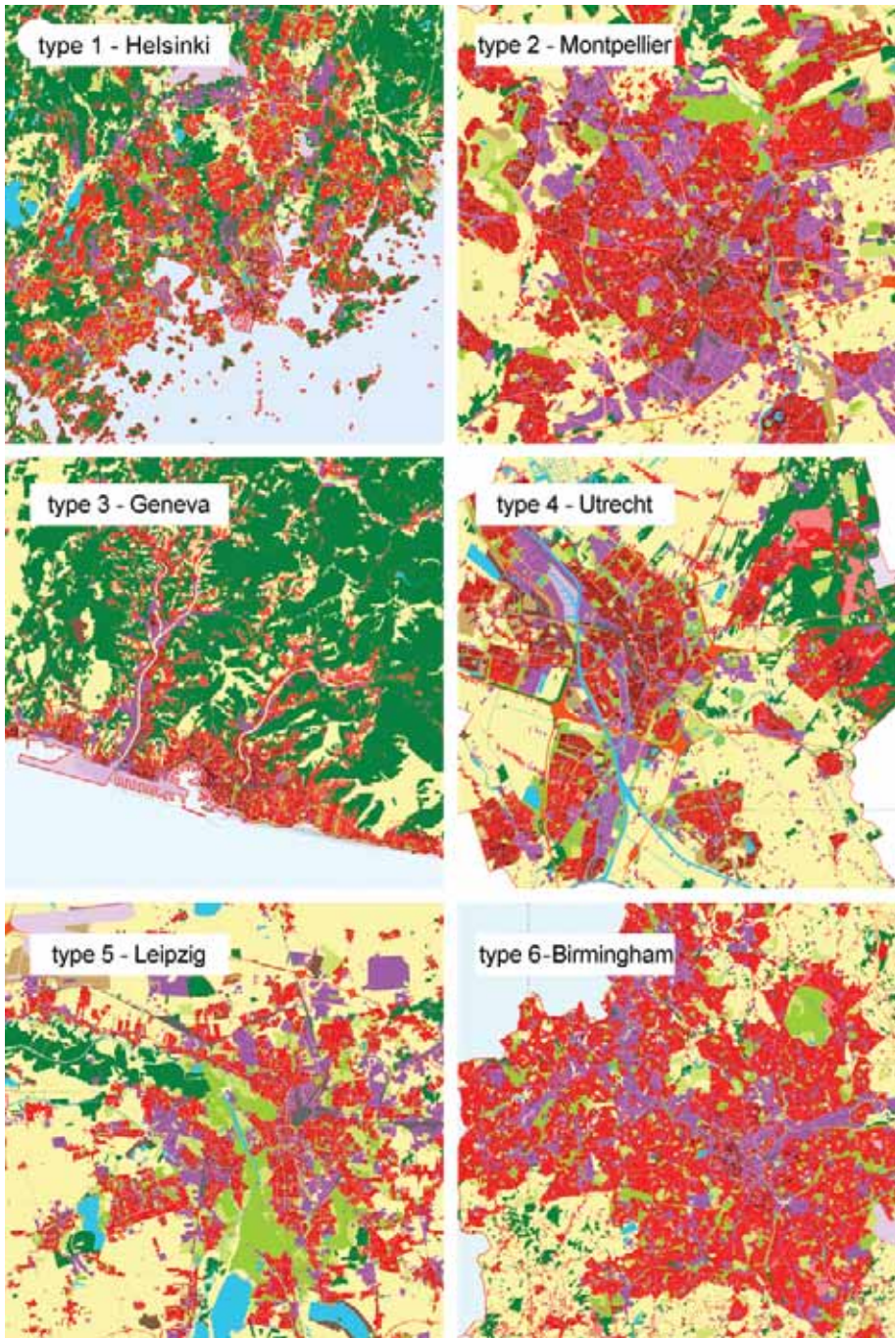


Figure 2.2. Representative cases of functional urban areas
Own elaboration based on Corine Land Cover database 2000.

The twelve remaining FUAs, distributed across the three basic morphological categories, are characterized mostly by simple settlement patterns. Regarding population redistribution, each of the three phases are represented in this subset, although units with population increase predominate.

The main aim of this study was the identification, for the purpose of the PLUREL project, of some basic typological criteria to be applied in subsequent efforts to define spatial aggregates, ones that would comply with the concept of the rural-urban region. When seen from this perspective, the above typology of the major European functional urban areas represented a preliminary step. Its limitations included inability to disaggregate the patterns of population change into the peri-urban and rural zones of the regions. In fact, the latter zones are by and large situated beyond the FUA boundaries.

In a study that was parallel to the one discussed above, W. Loibl, M. Koestl and K. Steinnocher (2008) developed a regional typology covering the whole territory of the EU-27. The regions identified correspond to individual NUTS-3 units, or, more frequently, to aggregates thereof. This, the so-called RUR (rural-urban regions) typology is based upon criteria related to settlement morphology, while emphasizing the population size and urban versus rural character of settlement. At an initial step of analysis, urban centers that serve as RUR nuclei were distinguished. These are morphological urbanized areas, delineated on the basis of detailed land use and population data. Adjacent urbanized land cover patches were identified as parts of single settlement units. Settlement areas containing more than 10,000 inhabitants were defined as urban centres, and those with above 100,000 inhabitants as core cities. All NUTS-3 units containing a core city were defined as RUR centre regions, and the surrounding units, featuring mainly residential (commuting catchment areas) and recreational functions, as RUR ring zones. In total, about 900 regions were identified, these then being subdivided into the following categories:

- 1 –Very large monocentric – the major metropolitan areas, with large core cities.
 1. 1 – Large monocentric – these are NUTS-3 units containing a large core city surrounded by peri-urban areas, with no larger sub-centres.
 1. 2 – Medium size monocentric – regions with a medium-sized core city and peri-urban areas lacking major subcentres.
- 2 –Urban polycentric – the NUTS regions with major core cities and peri-urban areas containing larger subcentres.
- 3 –Dispersed polycentric – regions with several core cities of medium size, and peri-urban and rural areas containing smaller settlements.
- 4 –Rural – the NUTS regions without core cities of large or medium size, characterized by a network of dispersed small settlements.

In further studies conducted by W. Loibl and M. Koestl (2008), the so-called sub-regions were identified, i.e. sections of the regions classified as urban, peri-urban and rural, respectively. The above typology was considered as the binding framework for the subsequent topical studies carried out within the PLUREL project. Its focus on mono- *versus* polycentricity was related to the assumption, according to which polycentric urban structure allows planners and policy makers to exert more effective controls over urban sprawl, and hence to relieve the

pressure of urbanization processes and urbanisation phenomena upon open space. This typology is in fact relatively similar to the one presented earlier by D. Pumain (1999), and cited in an earlier section of the present volume. Types 1 and 2 represent the urban regions, type 3 – the regions with a traditional structure of the settlement network, with middle-sized and small towns, and type 4 – the predominantly rural, but above all sparsely-populated peripheral areas. The latter category is represented by numerous regions in Spain, as well as in Scandinavian countries, but none of Poland's NUTS-3 regions, for example.

These, as well as the previously discussed typological results, have revealed some limitations of applying uniform indicator values with respect to urbanization processes and phenomena that appear in different forms over space. This suggests a need to introduce a differentiation of typological criteria and of allocation thresholds, in accordance with major variations in spatial patterns of settlement, the overall population density and land use structure, as observed in Europe. One of the possible approaches to this task may be setting specific indicator values for the individual European subregions, i.e. the groupings of countries which are defined in several projects of the ESPON programme.

Such an attempt was undertaken and tested in a pilot study for Poland (Kozubek and Korcelli, 2008). The set of typological criteria used for that purpose included: population size of the main urban centre, percentage of urban land use in the total land surface, and the share of urban population among the total. The following six categories of NUTS-3 unit were identified (Table 2.1; Fig. 2.3): *metropolitan*, *peri-metropolitan*, *urban*, *urban-rural*, *rural-urban*, *rural*.

Table 2.1. The set of typological criteria for Poland's NUTS-3 units

Type of NUTS-3	City size hierarchy	Percent of urban population	Built-up area (%)	Dynamics
Metropolitan	> 500 000 or 300 000–500 000 inhab.	> 75 > 75	>1,5 x average share for Poland (>7)	growth decline stable
Peri-metropolitan	area around metropolitan NUTS-3	> 70	> 7	growth decline stable
Urban	300 000–499 999	> 50	> 1	growth decline stable
Urban-rural	100 000–299 999	> 50	> 0,7	growth decline stable
Rural-urban	50 000–99 000	> 34	> 0,5	growth decline stable
Rural	< 50 000	.	.	growth decline stable

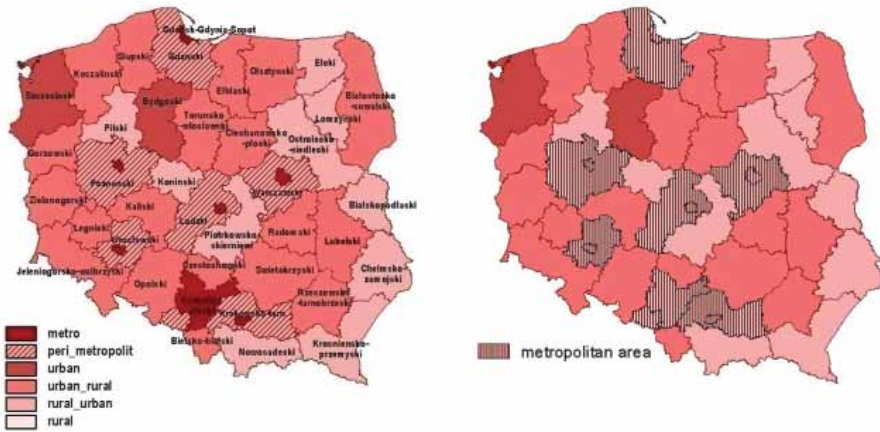


Figure 2.3. A typology of NUTS-3 units: a pilot study for Poland

In subsequent steps the set of criteria could be extended, so as to include the basic characteristics of settlement morphology and population change, the ones that are found particularly relevant in spatial policy-oriented studies. Also, some work is needed in order to identify an acceptable structure of indicator values, reflecting the observed differentiation of settlement patterns across Europe.

3. ECONOMIC DEVELOPMENT, URBANIZATION AND LAND USE

3.1. Conceptual background

Spatial patterns of economic activity, including the distribution and redistribution of firms and workplaces, are governed by a number of rules which pertain to such categories as transfer costs, processing costs and labour costs, the scale and agglomeration economies, the innovation diffusion, the process and product life cycles, and the human capital. These concepts, that stem from the classical industrial location theory (Weber, 1909), and from subsequent work by A. Loesch (1944), E.M. Hoover (1948), W. Isard (1960), R. Vernon (1966), and other authors, have to be referred to in any attempts to explain why certain activities tend to locate in large versus small cities, or in high rather than low population density regions. Such concepts are also called upon to interpret the way in which various activities relocate among cities and regions in response to changing configuration of the attractive as well as repulsive factors.

In this framework, W. Alonso (1971), K. Mera (1973) and more recently P. Krugman (1995) have demonstrated that economic efficiency is an increasing function of city size, while J. Lasuèn (1973) saw the role of large cities as of major innovation generating centres. Conversely, C.L. Leven (1978) argued that for only a small share of goods and services the large consumption markets represent the optimal locations. In the same vein, H. Richardson (1978) pointed to the weakening of locational constraints as a consequence of internalization of technological progress at an industrial organization, i.e. a corporation level, the trend that may lead to deconcentration of economic activity within urban and regional systems. Since the early 1990s, along with the accelerating globalization processes, the competitive advantage of metropolitan areas has again become evident. This has been reflected in contemporary economic location theory by, among others, the concepts of industrial clusters and of the integration of industrial with advanced service sector (Porter, 1990; Krugman, 1995).

With its main focus put on inter-regional and inter-urban scale, the economic location theory provides only general insights into questions concerning shifts of economic activity within urban-rural regions, i.e. between their urban, the

peri-urban and rural zones. At this spatial resolution level conceptual foundations for empirical analysis may be found in the theory of urban land rent, the origin of which is traced to J.H. von Thunen (1826). In its classical form (Haig, 1926; Alonso, 1964; Muth, 1969) this theory interprets urban spatial structure as shaped by the rule of substitution between aggregate accessibility (transportation cost) and the area covered – the size of lots occupied by individual households and commercial units.

In the analysis and interpretation of observed patterns of location and relocation of economic activity, a number of factors have to be taken into account that are by-passed in the general land use theory (see: Bourne, 1978). When referring to the concept of the urban-rural region, some of the factors are particularly relevant. One of these pertains to site attractiveness, or the so-called amenity rent. This important component of site rent is normally disregarded by the theory, owing to its irregular spatial variation. The amenity rent may be related to topography, environmental quality (landscape value, pollution levels etc.), as well as to historical factors, such as tradition and prestige associated with certain locations. The share of amenity component within the total rent value seems to increase over time. This is true in particular when spatial differences in accessibility tend to be leveled-off. However, owing to the inertia of land use, changes in spatial patterns of residence, and of economic activity, tend to lag behind the changing accessibility, while relating increasingly to other locational factors.

Another important question in the context of the urban-rural region pertains to discontinuities at the edge of urban land uses. Land development along the urban-rural interface represents a problem that is difficult to interpret in the framework of the urban land theory. In the peri-urban zones time lags, or premature development due to land speculation, or physical and institutional barriers to land succession, may overshadow the rules concerning interdependence between land use on the one hand, and the accessibility and locational amenities on the other (Couch *et al.*, 2007).

Policy instruments – provisions and restrictions concerning land use, such as zoning, service and building standards, and the role of the public sector as investor, are also the factors that represent an important dimension in the land development process. D. Boekemann (1982) defines explicitly the role of public bodies in this domain as the *production of locations (Standortproduktion)*.

In PLUREL the interrelations between economic development, urbanization and land use change were investigated at two spatial resolution levels. At the scale of the set of NUTS-3 units, covering the area of EU-27 countries, the focus was put on identification of selected correlates of the intensity of urban and peri-urban land uses, as well as on the way in which these correlates vary among the rural-urban regions. Such interrelations were formulated in terms of generic response functions relating the demand within and between the urban, peri-urban and rural areas to the individual types of rural-urban regions.

On this basis projections of future land use patterns were elaborated, following alternative assumptions. A number of processes are underway that may have a profound impact upon the spatial structure of human settlement and space

economy in Europe in a longer time perspective. These processes, which can be considered as external factors, or determinants, have been identified, and their role interpreted in at least several policy-oriented research studies, such as the ESPON 3.2 (2007) project. They include, *inter aliae*, ageing and shrinking of the population, massive immigration from third countries, climate change, considerable increase of energy cost, deindustrialization as a consequence of globalization of economy, expansion of telework. The influence of these phenomena upon land use patterns in rural-urban regions can assume various scale and form, in particular, when such processes are taking place concurrently. This question is considered in alternative development scenarios.

In PLUREL reference was made to the four benchmark scenarios, as formulated in the IPCC report (see: Ravetz and Rounsevell, 2008). These have been adopted in general terms, and further specified for the purpose of the project. The A1 – the *hyper-tech* scenario was assumed to generate an acceleration of the peri-urbanization processes. According to A2 – the *extreme water scenario* urban change assumes varying patterns over space. The B1 – the *peak oil* scenario implies more concentrated urban development. Finally, B2 – the *fragmentation* scenario brings about increasing social and economic polarization of urban areas. In the interpretation of results of the alternative projections emphasis has been put on territorial differentiation in the pace and patterns of peri-urbanization processes (see: Piorr *et al.*, 2011).

At the regional and local level, the economic correlates of land use change have been traced back to infrastructural investments, the allocation and relocation of workplaces, and of commuter flows. The project's objectives included identification of interdependence between changing employment opportunities and physical urban expansion. Effects of economic development were to be investigated as to their interrelations with settlement patterns and transportation networks, as well as with population development and social issues. Spatial range of economic spread effects was to be traced against the changing distribution, as well as socio-economic composition of urban and rural population within the rural-urban regions. Another objective of the study has been evaluation of the role of policies pertaining to economic development, the policies carried on at an urban and a regional level.

These general objectives and assumptions had to be translated into an empirical research protocol. Within the rather wide thematic scope related to interdependence of economic development and land use change, a limited number of questions could be selected which fulfill several basic criteria. Firstly, these questions should be theoretically viable; secondly, they should be policy relevant; and thirdly, they should address the core problem analyzed in the PLUREL project, i.e. interrelations between the urban, the peri-urban, and rural components of rural-urban regions.

One of such questions pertains to interdependence of residential mobility and redistribution of jobs. At early phases of the suburbanization process it is mainly residential moves that are associated with the wave of urban expansion. Subsequently, jobs connected initially with market services and public services, but increasingly also with other sectors are attracted to peri-urban areas. In accordance

with the land rent theory, entrepreneurs tend to trade off better accessibility of central city locations for larger space and site amenities, as found in the surrounding zones. This generates further migration to the peri-urban areas, from the city as well as from smaller towns and rural areas. A feedback effect starts, reflecting the well-known, though still unresolved problem of whether jobs follow the people or people follow the jobs.

More relevant in the present context is the evolution of travel, in particular commuting to work patterns in a rural-urban region. Is mean trip length increasing commensurably with territorial expansion of the region and population deconcentration, as journeys between different peri-urban locations replace to some extent the formerly dominant suburb-to-city travel patterns? Also, do local labour submarkets tend to emerge, focusing upon secondary urban centres situated in the peri-urban zone? To what an extent are local and regional labour markets segmented, in terms of spatial patterns, according to skill level, occupational status, ethnicity, etc.? Finally, what are the typical, as well as best-practice policy responses (related to taxation, mass transit), and their coordination at the regional level? In the framework of PLUREL some of these questions have extensively been investigated by V. Helminen *et al.* (2010).

Another set of research questions, relevant to the study of rural-urban regions, pertain to the spatial range of economic spread and backwash effects. The large cities are generally attributed the role of engines of economic growth, at both a national and a regional level. At a certain distance from the urban centre, however, the positive, i.e. growth impulses tend to give way to negative – the backwash effects. Their character and intensity differ between countries, but the phenomenon itself is quite general, often referred to as intra-regional economic polarization. The backwash effects take the form of outmigration of young people, departure of local innovative firms, and transfer of locally accumulated savings to the large centres. A question arises, how are these negative effects distributed among various types of areas and settlements, in what is defined as rural hinterland. What are the contemporary trends in this respect? What kinds of compensatory flows towards the rural zones exist that may indicate the presence of partnership relations between the urban, peri-urban and rural segments of the rural-urban regions?

Within this topic, a subset of issues concern economic activities, in particular private firms located in peri-urban and rural zones; their origin, relocation, dynamics. Are these firms mainly products of local entrepreneurship, i.e. endogenous growth factors, or the reflection of business decentralization from the regional core? Is the market for goods and services they offer mainly local, or are they able to penetrate more distant markets? When they are successful and expand, do they tend to move to more central locations? Such questions have been addressed in a study conducted for the region of Warsaw, and the results are presented in another section of this chapter.

When observed at the scale of individual regions, the spatial patterns of economic activity, as well as its dynamics, are sensitive to a number of characteristics of such regions. They include, among others, the size (population, as well as area), morphology, functional profile, ethnic composition of population, popu-

lation dynamics, and planning-policy aspects. These features, along with characteristics of data and the methods used, set the limits for the generalizations presented below, the ones that pertain to interrelations between economic and land use development in European rural-urban regions.

3.2. Economic development – land use response functions at the European level

The general course, as well as spatial patterns of urbanization are seen to follow the processes of economic development and the related social change. This interdependence, however, when expressed in quantitative terms, i.e. response functions, changes over time and depends upon the model of socioeconomic development. In the present section interrelations between economic development and land use characteristics are examined with the help of standard statistical tools, i.e. by applying principal component analysis as well as regression analysis. The analysis was carried out at NUTS-3 level for EU-27, and was based on data covering more than 20 variables. In particular, the land use characteristics were examined in their relation to such socioeconomic indicators as GDP values, the employment rates and employment composition, as well as spatial accessibility patterns.

In the initial few paragraphs the basic concepts and assumptions, as applied in the present analysis, are briefly referred to. This is followed by an overview of relevant data sources and an evaluation of the statistical data used. Subsequently, basic dimensions of territorial differentiation of socioeconomic – land use relationships, as identified *via* principal components analysis, are discussed. In particular, distribution of component values by individual types of rural-urban regions, according to the RUR typology, is looked into. The next step of analysis pertains to relations between selected pairs of economic and land use indicators. Several socioeconomic variables are identified and compared with respect to their statistical interdependence with a synthetic measure of land occupancy, i.e. the share of artificial surfaces within the total land area. Results of the analysis are summarized, and some questions for further investigation suggested in the concluding paragraphs.

As assumed earlier in this study, in the analysis of interdependence between economic development and land use change it is appropriate to refer to classical theory of location of economic activity, as well as to some of its more recent extensions. The set of location factors referred to, which was restricted initially to such basic categories as soil fertility, transfer costs and labour costs, has over time been considerably extended, so as to include rules relating to scale and agglomeration economies, innovation diffusion, human capital, the product and process life cycles, the formation of industrial clusters, and the integration of industrial with producer services sector. In the same vein, economic location theory

needs to be employed when the question of interrelations between the urban, peri-urban, and rural zones of rural-urban regions, i.e. the core problem tackled in PLUREL, is addressed.

In the PLUREL's work programme, research objectives concerning patterns of economic development in rural-urban regions are broadly defined. Economic development, along with population growth, is considered as a major driving factor of land use change in rural-urban regions; more specifically, it accounts for the growing share of artificial surfaces in the total land area. This link is conceptualized in the DIPSIR framework, the concept elaborated in the European Environmental Agency (see: Ravetz, 2009), and applied in constructing land use change projections for 2015 and 2025, on the basis of the RUG model (Rickensbush, 2009), following alternative global development scenarios. The socio-economic development indicators are considered as measures of the pressure on land use, here interpreted in terms of intensity of land occupancy by human settlement. The effects of economic development are investigated as to their interrelations with patterns of spatial accessibility, transportation networks and commuter flows (Helminen *et al.*, 2010), as well as population change and its composition (Loibl and Kostl, 2010).

In this contribution, that pertains to a transnational level, covering the set of European rural-urban regions (comprised of respective NUTS-3 units and their aggregates), the focus is put on economic development – land use generic response functions (see: Zasada and Piorr, 2010). The aim of the study is to arrive at statistical measures of interrelation between uni-dimensional, as well as composite indicators of socioeconomic development level (and the change thereof) on the one hand, and the intensity of land occupancy on the other. The results are to be used as an input to alternative scenario – specific projections that, in turn, serve as a basis for the iIAT – the Interactive Impact Analysis Tool, the results of which are presented at both the aggregate (i.e. European), and the region – specific level (Zasada and Piorr, 2010).

Aside from measuring statistical relationships between economic development and land use intensity for the set of spatial units (NUTS-3 regions) included in the analysis, an attempt is made in the present study to identify major dimensions of differentiation of this interrelation. One of such dimensions refers to the morphological typology of European rural-urban regions, as defined by W. Loibl, M. Köstl and K. Steinnocher (2008).

The linkages between economic development and land use change can assume various forms, even though their presence constitutes a rather trivial problem. In fact, certain indicators express two sides of the interdependence at the same time. A list of relevant variables, to be assembled for statistical analysis, may include three types of measures. The first type consists of “pure” land use indicators, such as shares of individual land use categories in the total land area, rates of transition between these categories, the size of homogeneous land use plots, or the frequency of neighborhood between various land uses. The second type are “non-spatial” economic variables referring mainly to production, distribution, employment and consumption. Data of the third type pertain to infrastructure and settlement. This is the area where the overlap takes place. There

is little doubt that such indicators as density and pattern of road networks, or of energy supply systems represent economic development and land use characteristics at the same time.

In our attempt at collecting an appropriate data base, all these types of variables have been included. In the course of the analysis, data from the following sources were used: Eurostat, several ESPON projects (1.1.2; 1.2.1; 1.2.2; 1.3.1; 2.1.1; 2.2.2; 3.1; 3.2), as well as ESRI. It should be emphasized that data availability still constitutes a bottleneck in the investigations of urbanization processes and regional change at a transnational level. Data for European NUTS-3 regions are still incomplete, i.e. there are gaps in both their thematic and temporal dimensions. The data borrowed from the ESPON data base that refer to the period of 1996–2002, are based on previous NUTS-3 divisions; therefore, they had to be processed in order to be integrated with those available within the up-to-date territorial systems. Conversely, data from the ESRI (.shp file) were complete, and did not require adjustments. Missing in particular are comparable data for more than one point in time. This limitation seriously restricts possibilities of tracing land use change and its correlates.

In the data base collected for the purpose of the present analysis several NUTS-3 units were not represented. Hence, these units were disregarded in the statistical analyses. It has to be admitted that variations in the size of NUTS-3 units between individual countries have an impact upon the results obtained.

In the first stage of the analysis interrelations between economic development and land use characteristics were examined by applying principal components analysis, a method that is generally used for data reduction and structure detection. The purpose of data reduction is to remove redundant (that is, highly intercorrelated) variables from the original data file, and replacing it with a more compact set. The purpose of structure detection is to examine the underlying, or latent relationships between the variables. The initial list of indicators collected for the purpose of the present analysis included 24 variables (Table 3.1). Application of the method resulted in the identification of several components. The five main components account for nearly 56 percent of the total variance. Statistics relating to the main components are given in Table 3.2.

The first component identified is highly correlated with several variables, including GDP per capita values (0.82), GDP per capita calculated using Purchasing Power Parity index (0.81), total employment per 1000 inhabitants (0.78), the share of artificial surface (0.77), and the share of urban fabric (0.75) within the total land area. This component can be termed *spatial development intensity component*. The second component is correlated mainly with measures of spatial accessibility, in particular with time – distance to market (NUT's main centre) by road and rail (0.88). It is therefore defined as *spatial accessibility component*. The distribution of its values is highly sensitive to the size of spatial units of reference.

The third component, highly correlated with the rate of unemployment, is identified as *structural maladjustment component*. The fourth component is mostly related to the share of industry in total employment (0.81), and is therefore identified as *industrial employment component*.

Table 3.1. The data set used in the principal components analysis

ARSU96N3 – share of artificial surfaces (E 1.1.2)
UFL296N3 – share of urban fabric
ALL296N3 – share of arable land
PCL296N3 – share of permanent crops
NCA01N3 – number of commercial airports (E 1.2.1)
LRO01N3 – length of road network (km)
LR01N3 – length of railway network (km)
CCA01N3 – connectivity to commercial airports by car to the capital or centroid (hours)
CM01N3 – time-distance to the nearest motorway access or to the NUTS centroid by car (hours)
ACME01N3 – potential multimodal accessibility
TMROP297N3 – time-distance to market by road
TMRAP297N3 – time-distance to market by rail
TMRRP297N3 – accessibility time-distance to market by rail and road; half-life mesoscale
SMWH04 – sum of all weighted hazard values (E 1.3.1)
POPDENSN30 – population density
DAVGPOP950 – average population change 1995-2003 (%)
GDPH02N3 – GDP in Purchasing Power Parity per inhabitant
GDPEH02N3 – GDP in Euro per inhabitant
UNRT01N3 – unemployment rate
UNRT98N3 – change of unemployment rate 1998-2001
AHFF_%e – primary sector employment (agric., Hunt., fore., Fish.)
Indus_%e – industry – employment
serv_%e – services – employment
all_emp_1 – total employment/1000 inhabitant

Table 3.2. Rotation sums of square loadings for the main components

Rotation sums of squared loadings			Component
Total	% of variance	cumulative %	
4.775	19.895	19.895	1
4.666	19.442	39.337	2
1.985	8.270	47.608	3
1.943	8.096	55.703	4
1.792	7.465	63.163	5

The next step in the analysis was an attempt to identify differences between individual types of regions (according to the so-called RUR typology), as identified by W. Loibl, M. Koestl and W. Steinnocher (2008), in terms of the distribution of component scores within the respective sets of NUTS-3 units. This is illustrated by Figure 3.1 which shows distribution patterns of component one scores. Its

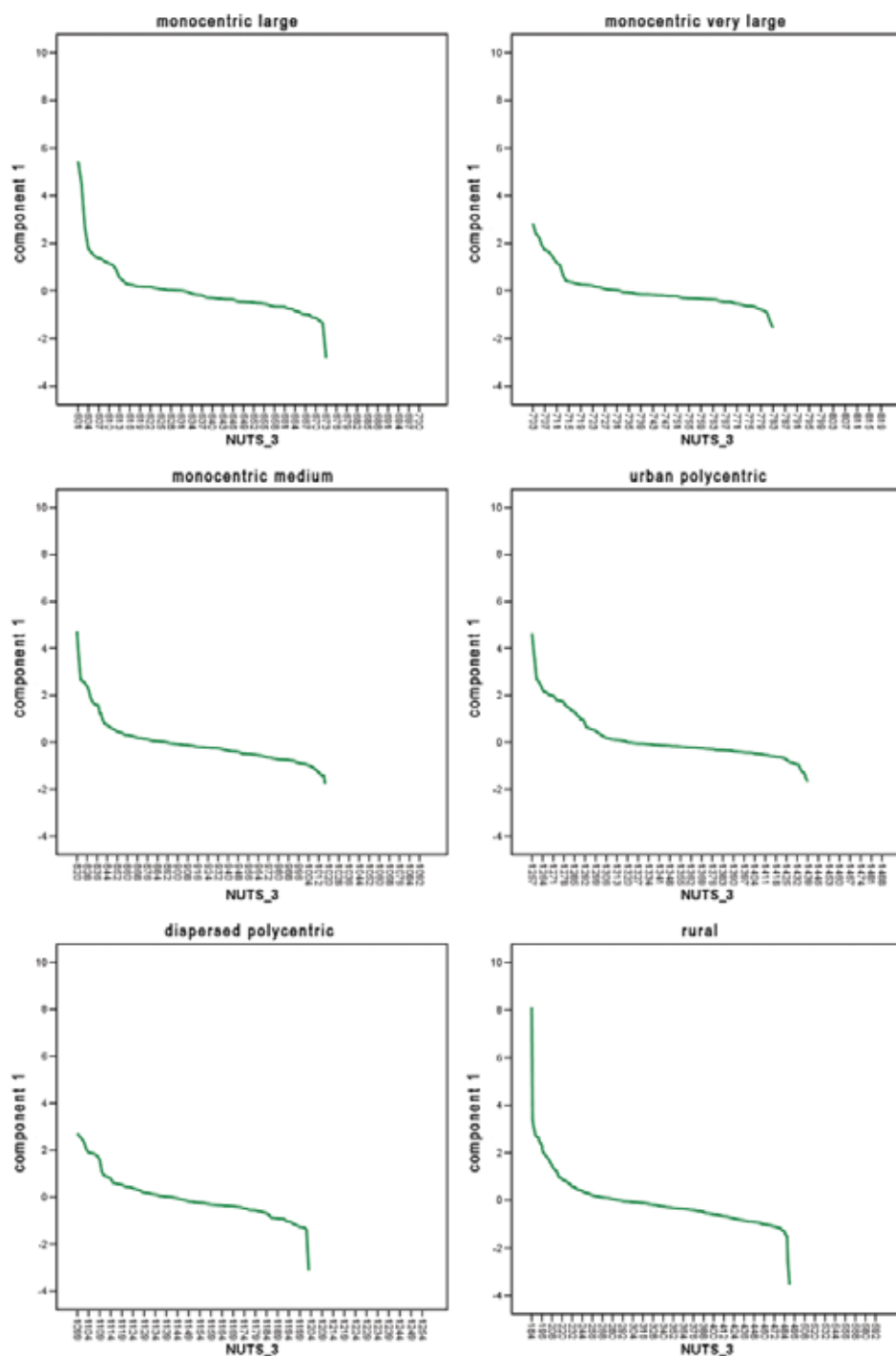


Figure 3.1. Distribution of component one scores by RUT types

standardized values are marked on y axis. The flat distributions indicate relatively small differentiation of the component values within the class of NUTS-3 units belonging to a specific RUR type. High gradients reflect a large differentiation. The latter is clearly a characteristic of rural regions. Conversely, regions of type 1 (very large monocentric) and type 4 (urban polycentric) display a considerable degree of homogeneity in terms of the distribution of component scores. It should be emphasized that similar differences in the patterns of component scores are found in the case of the remaining components.

At the following stage several variables were selected for the purpose of further analysis, namely the ones that exhibit relatively high correlation with the intensity of land used for settlement, here represented by the share of artificial surfaces in the total land area. These variables were the following: the number of persons employed (total employment) per 1000 inhabitants; spatial accessibility – time-distance to the unit's main centre; population density; GDP per capita. An additional variable included was change of GDP per capita, calculated in Purchasing Power Parity terms, between 1996 and 2006. Also, in order to illustrate the range of differences in economic productivity of a unit of land, the share of artificial surfaces was regressed against GDP value per square km.

In the regression analysis the shares of artificial surfaces, by individual NUTS-3 units, were converted into natural logarithm values. For the purpose of graphic presentation the spatial units (1289 observations) were assembled into 20 five-percentage-point classes, from 0–5 to 95–100 percent of the share of artificial surface within the total land area. The use of bar diagrams, rather than of more conventional scatter diagrams, allows us to avoid the problem of heavy clustering of dots, since the overwhelming majority of observations fall into low-value sectors (Table 3.3). The length of individual bars reflects median values of independent variables for the respective land use classes. It should be noted that the distribution of values within the individual classes tends to be highly skewed.

As the results show (see Figs. 3.2–3.7), differences between the land use classes, as identified on the basis of the share of artificial surfaces, are especially pronounced in the case of GDP per capita values (not to speak of disparities in GDP per sq. km values which could be easily anticipated). It may also be noted that the statistical relation between the share of artificial surface and population density is extremely regular. This suggests that population density could actually be used as a proxy for the share of artificial surface, when data for the latter variable are not available.

In conclusions, it should be pointed out that considerable differences were found among the six types of rural-urban regions (cf. PLUREL's RUR typology) with respect to the distribution of values of economic development indicators. This pertains to the average level, as well as to the variance among individual units which were assigned to separate RUR types. The units in regions of type one – very large monocentric, as well as of type four – urban polycentric, are characterized by relatively small variations of indicator values. The biggest variations pertain to type six, i.e. rural regions. This result suggests that, while the large metropolitan areas across the EU tend to display common land use and eco-

conomic development characteristics, differences between the predominantly rural regions remain quite profound.

Table 3.3. Share of artificial surface categories by NUTS-3 units

Classes of NUTS-3	Class ranges (percent)	Frequency	Percent	Percent valid	Cumulative percent
1	0-5	649	48.6	50.3	50.3
2	5-10	301	22.5	23.4	73.7
3	10-15	77	5.8	6.0	79.7
4	15-20	44	3.3	3.4	83.1
5	20-25	52	3.9	4.0	87.1
6	25-30	25	1.9	1.9	89.1
7	30-35	25	1.9	1.9	91.0
8	35-40	21	1.6	1.6	92.6
9	40-45	11	0.8	0.9	93.5
10	45-50	19	1.4	1.5	95.0
11	50-55	15	1.1	1.2	96.1
12	55-60	7	0.5	0.5	96.7
13	60-65	4	0.3	0.3	97.0
14	65-70	7	0.5	0.5	97.5
15	70-75	9	0.7	0.7	98.2
16	75-80	3	0.2	0.2	98.4
17	80-85	8	0.6	0.6	99.1
18	85-90	7	0.5	0.5	99.6
19	90-95	2	0.1	0.2	99.8
20	95-100	3	0.2	0.2	100.0
Total		1289	96.5	100.0	
no data		47	3.5	no data	
Grand total		1336	100.0		

Results of the regression analysis show that differences between individual land use intensity classes, as determined according to the share of artificial surfaces, are especially large in the case of GDP per capita values. Namely, the GDP values for the highest artificial surface share category (i.e. highly urbanized areas) are more than twice the respective median values for the remaining classes. It has also been found out that the income gap between urban and peri-urban areas on the one hand, and rural areas on the other, has been widening. This is revealed by the analysis of interrelation between GDP per capita change, as registered for the period of 1996-2006, and the intensity of land used for human settlement, i.e. the share of artificial surfaces in the total land area.

In further work the results should be verified by using time cross-sectional data. It would be crucial to extend the analysis into the whole decade of

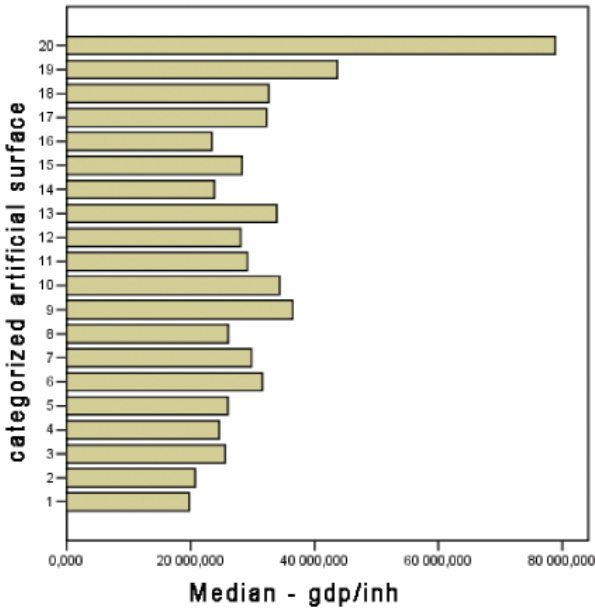


Figure 3.2. Relationship between categorized *artificial surface* share and median GDP per capita

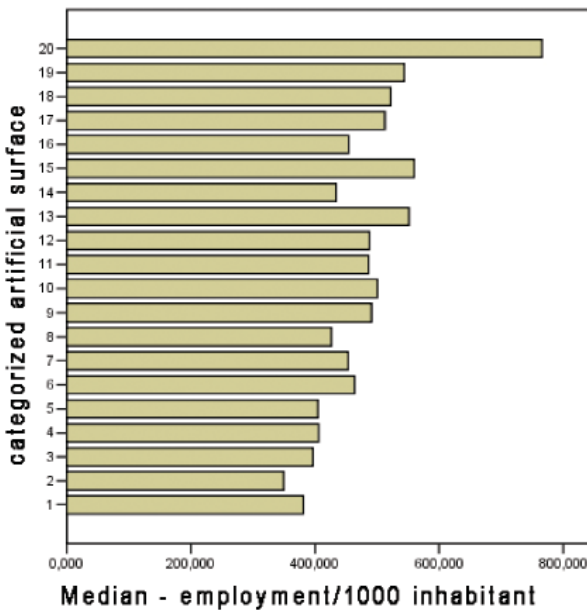


Figure 3.3. Relationship between categorized *artificial surface* share and employment per 1000 inhabitants

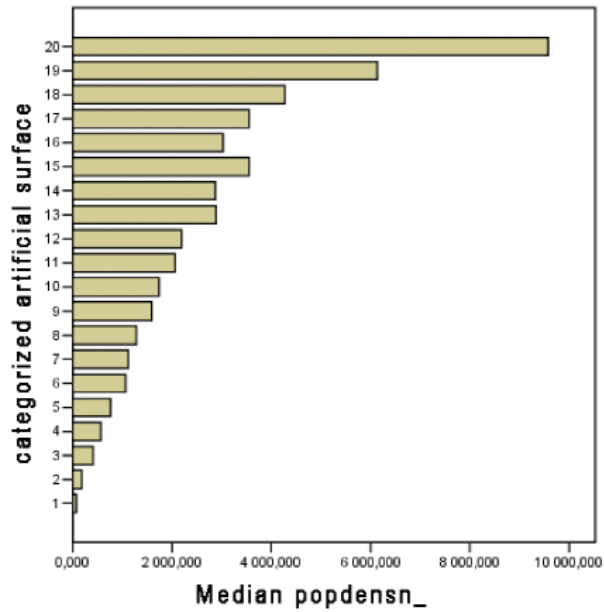


Figure 3.4. Relationship between categorized *artificial surface* share and population density

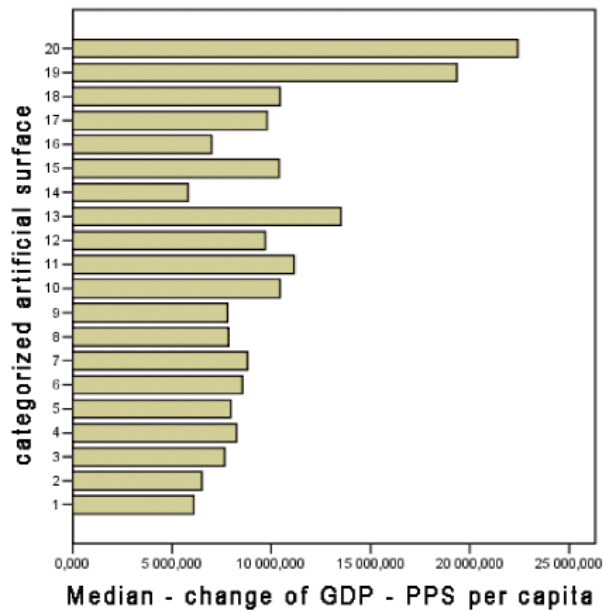


Figure 3.5. Relationship between categorized *artificial surface* share and change of GDP – PPS per capita

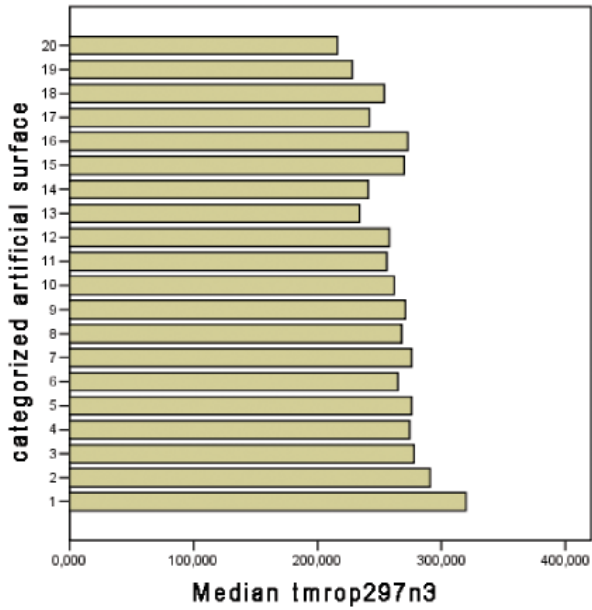


Figure 3.6. Relationship between categorized *artificial surface* share and accessibility time to NUTS-3 centres by rail and road

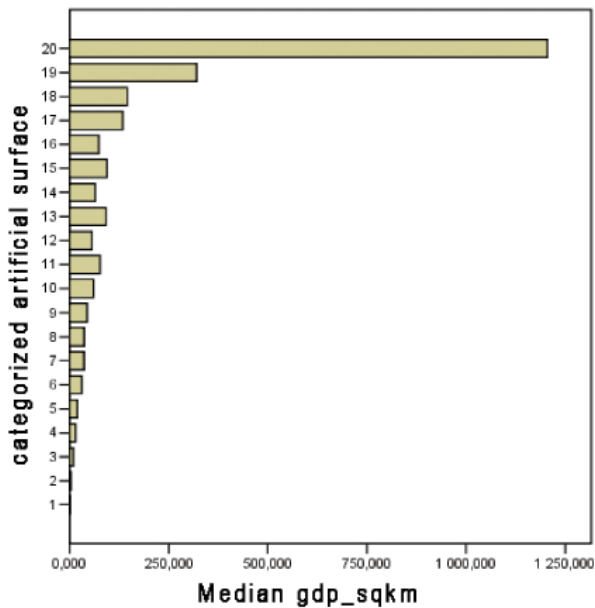


Figure 3.7. Relationship between categorized *artificial surface* share and GDP per sq. km

2000–2010, in order to reflect the scope of spatial change related to metropolitan development processes in Europe as a whole, as well as to systemic transformations in countries of Central and Eastern Europe.

3.3. Economic and population change and the pattern of urban, peri-urban and rural areas in Europe

In this part of the study the focus is put on interrelations between spatial configuration of selected socioeconomic indicators and the patterns of urban, peri-urban and rural areas in Europe. These indicators are represented by the quotient of GDP potential to population potential values. As demonstrated earlier, Gross Domestic Product and population density comprise the variables that exhibit particularly strong correlation with settlement intensity, here represented by the share of artificial surface in the total land area. In the case of these variables, differences in the share, as observed between individual spatial units, are especially pronounced. The model applied belongs to the class of spatial interaction models (see: Wilson, 1974). The potential quotient values were calculated at the level of NUTS-X units in the EU-27 countries for the year 2000 and, on the basis of alternative scenarios, were projected till the year 2025. Spatial distribution of those values is confronted with the patterns of urban, peri-urban, and rural areas, as defined and delineated for the purpose of the PLUREL project.

It is generally recognized (see: Bengs, 2005) that in Europe, in comparison to other parts of the world, the urbanization process is almost completed, in the sense that the phenomenon of massive rural-to-urban migration belongs to past experience. Nevertheless, relations between urban and rural areas are quite dynamic. These are multi-level interactions dependent upon a multitude of factors, including environmental characteristics, transportation network, social and political structure, and the prevailing type of economic activity. These interactions have been analysed in a number of research projects, including the major ESPON 1.1.2 (2004) study on: *Urban-rural relations in Europe*. A dynamic regional typology that originated within that project, one on interdependence between the intensity of urban influence and the degree of human intervention, was already referred to in the second chapter of this report. The increasing role of peri-urban areas, along with their territorial extension, is seen as the major evidence of the evolving urban-rural interactions.

As it is assumed in the present study, the macro-scale territorial patterns of urban and rural settlement in Europe can be depicted by a configuration of spatial potential values. More specifically, the quotient of GDP potential related to population potential values are assumed to represent a suitable measure of socioeconomic development level, and to reflect settlement intensity at the macro scale. The application of the isopleth method allows us to identify the main

urbanized core and peripheral areas, and to confront this pattern with the delimitation of urban, peri-urban and rural subregions, as identified in the PLUREL RUR typology (Loibl and Köstl, 2010).

In the analysis of regional systems spatial potential values are interpreted as a measure of interaction between the regions that constitute parts of a system. It is a relatively rarely used measure, though its interdependence with a number of social and economic development indicators has been proved in numerous studies (see: Steward and Warntz, 1958; Chojnicki, 1966; Czyż, 1985, 1995, 2002; Pooler, 1987; Kozubek *et al.*, 2009). Its traditional interpretation is one of an indicator of nearness, or accessibility of the population concerned, or of its aggregate income power, to a given point. In this study, spatial potential defines possible intensity of interaction within the regional system as a dependent variable, related to two selected indicators – the Gross Domestic Product and population number. The intensity of interaction is expressed by aggregate distance between a given unit and all the other units within the regional system. A territorial unit characterized by relatively small values of the basic indicators can be attributed a high potential value, owing to its nearness to other spatial units, ones with high values of these indicators, and *vice-versa*.

The income (here, the GDP) potential of a given territorial unit is the function of income generated in this unit (i.e. its intrinsic potential), as well as in all other units, and of its aggregate distance from those units. The same rule pertains to the population potential. In Table 3.4 the two versions of the potential model, as applied in the present analysis, namely, the so-called classical and the hierarchical model are defined. The potential quotient values were calculated for the year 2000 (observed data) and for the year 2025, within the framework of four alternative scenarios, as employed in PLUREL for future projection purposes.

Table 3.4. Two versions of the potential model applied

The Model	Interpretation
$V_i = \sum_{\substack{j=1 \\ i \neq j}}^k \left(\frac{P_j}{d_{ij}} \right)$	VD Model – including only the friction of distance and population number
$V_i = \sum_{\substack{j=1 \\ i \neq j}}^k \left(\frac{P_j}{d_{ij}} \right) h_{ij}^{-1}$	VDH Model – heuristic modification of classical model including additionally the hierarchy of regions

The data used in the analysis were borrowed from the data base assembled in the project. In the data base each spatial unit (of NUTS-X level) is defined in terms of the share of urban, peri-urban and rural areas in its total land surface. According to the definition used in PLUREL, the peri-urban areas comprise urban fringe and urban periphery areas, containing settlements of less than 20 thousand inhabitants, and are characterized by the minimum population den-

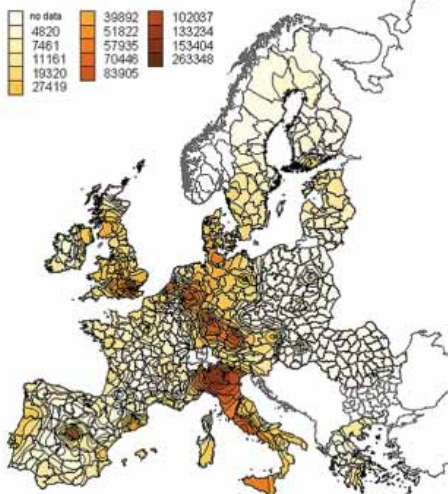
sity of 40 inhabitants per sq. km. The calculated potential quotient values are presented on maps elaborated using the MAPVIEWER 7 programme.

Interdependence between the potential quotient values and land use patterns is measured by simple correlation (Pearson's) coefficient. The type of land use is defined on the basis of the share of urban, peri-urban, or rural areas within individual NUTS-X units (NUTS-X are NUTS-2 units in Germany, Austria, Belgium, Slovenia and Italy, and NUTS-3 units in the remaining EU countries). In the case of the urban areas the correlation is significant and high (0.7–0.9); for the peri-urban areas it is found to be still significant and moderately high (0.5–0.6), while for the rural areas the relationship tends to be negative, though generally insignificant. The spread of correlation values for the rural areas is by far the biggest (Fig. 3.8 represents spatial visualization of these relationships). These results, for the observed point in time, i.e. the year 2000, are generally in line with the earlier conclusions which were arrived at on the basis of the multivariate analysis.

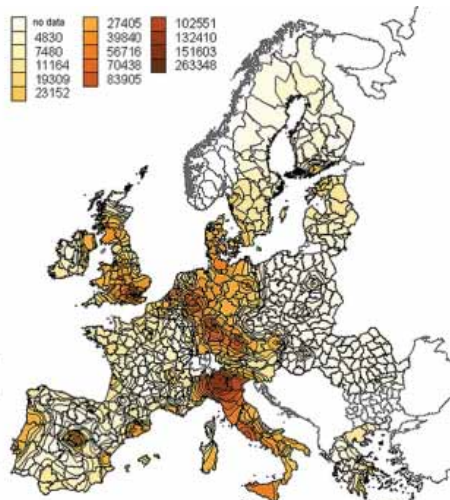
In the PLUREL project a framework was developed concerning visions of the future of rural-urban regions, while referring to the global scenarios of the IPCC (Intergovernmental Panel on Climate Change; see: Ravetz and Rounsevell, 2008). The first of these, the A1 scenario, describing a world of rapid economic growth based on technological progress and liberal spatial policies, is seen to imply an acceleration of peri-urban development, as well as an on-going transformation of rural areas. The second scenario (A2 – extreme water), referring to effects of external shocks – flooding, drought and sea level rise, brings about lower urbanization pressure and the maintenance of agricultural base of rural economies. The subsequent scenario (B1 – peak oil) that refers to a global, public policy lead approach to sustainable development under conditions of rapid rise in energy costs, is interpreted in terms of more compact urban development and a decline of remote rural areas. Finally, B2 – the social fragmentation scenario implies economic, as well as social, including ethnic polarization of both urban and peri-urban areas.

Following these assumptions, alternative projections were elaborated (see: Zasada and Piorr, 2010) of future (for the years 2015 and 2025) change of some indicators, including GDP and population number, by individual NUTS-X units (Rickenbush, 2009). These data have been used in the present study to calculate the possible future GDP – population potential values, as well as to present their spatial distributions (see: Figure 3.9).

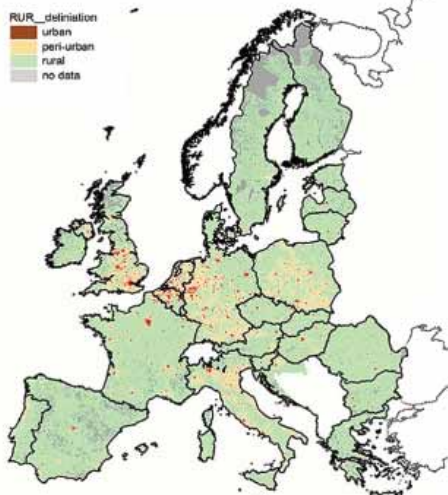
In general terms, the evolution of human settlement systems, as well as of spatial socioeconomic systems tends to be characterized by high inertia level. In the case of Europe, with its long history and advanced stage of urbanization, rapidly growing population ageing, and only a moderate scale of interregional, as well international migration, one can anticipate rather limited changes of the observed territorial patterns in a 25 years perspective. This expectation is confirmed by the results obtained in the course of the present analysis. In the initial point in time, i.e. the year 2000, the concentration of high potential quotient values along the axis extending from Middle England to Northern Italy is clearly visible (Fig. 3.8). The NUTS-X units that are situated within this zone feature both



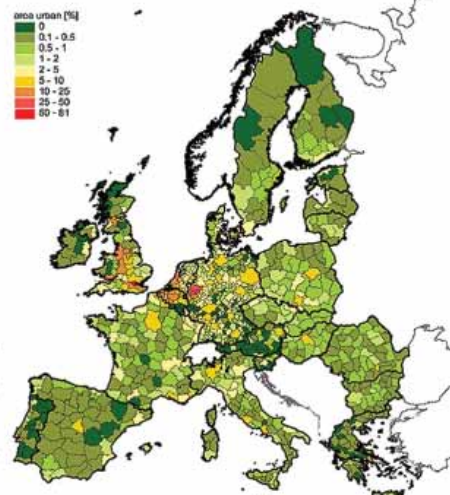
1. Potential quotient values – Vd model (2000)



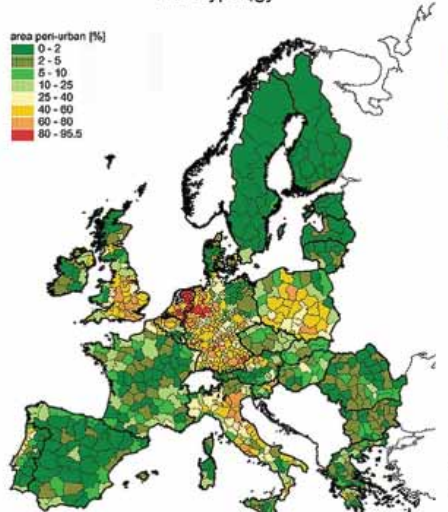
2. Potential quotient values – Vdh model (2000)



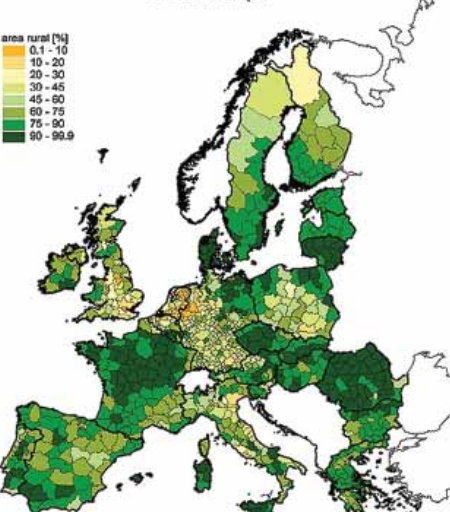
3. RUR typology



4. Urban areas



5. Peri-urban areas



6. Rural areas

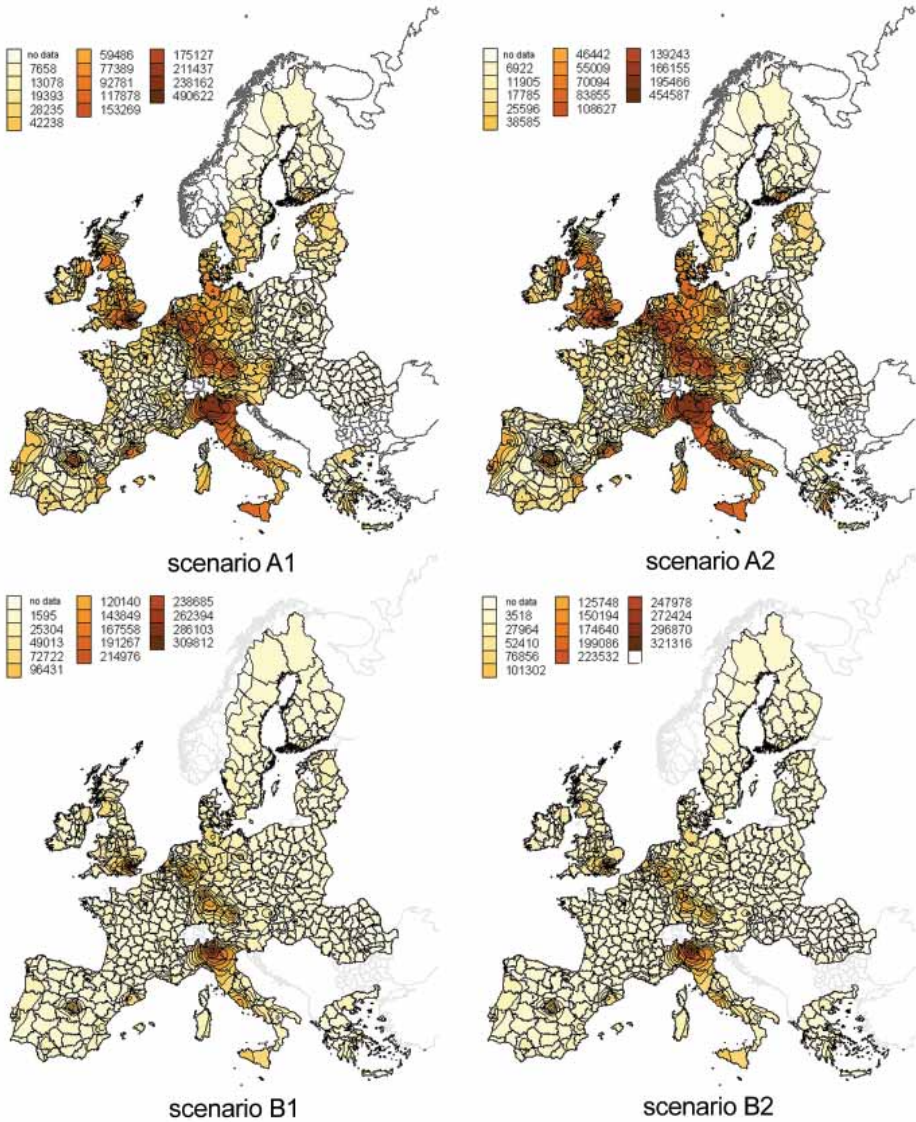


Figure 3.9. Potential quotient values in 2025 – four scenarios

high population density and high GDP per capita, as well as high shares of urban and peri-urban areas within the total land surface. The dominance of this central belt, i.e. the European core region, is maintained by the year 2025 according to each of the four alternative projections. In the case of A1, and, in particu-

Figure 3.8. Spatial visualization of interdependence between potential quotient values and land use patterns

Source: 3, 4, 5, 6 – Loibl and Köstl (2008).

lar, the A2 scenario (Figure 3.9 – A1, A2), this dominance is actually growing, with some extension of the high potential zone, mainly to the east. Conversely, according to the B1 and the B2 scenarios (Figure 3.9 – B1, B2) the overall spatial pattern of potential values is much more diffused. The isopleth values generally decrease, with a notable shrinkage, and a partial fragmentation of the central NW-SE belt, consisting ultimately of islands of high spatial potential values, rather than a continuous zone.

It should be noted that differences among the individual scenarios, in terms of correlation between the potential quotient values and the shares of urban, peri-urban and rural areas within individual NUTSX units, remain relatively small (see Table 3.5). As identified in the analysis, the A1 and A2 scenarios indicate a trend towards growing spatial divergences, while the B1 and B2 scenarios point to a relative convergence of the potential quotient values at the European level. Still, the basic spatial patterns of urban, peri-urban and rural areas are seen to be generally stable over the projection period. In reality, these patterns undergo mutual shifts (in particular an extension of peri-urban, at the cost of rural areas), as well as internal change which should be a subject of further studies focusing, among others, on the processes of urban and rural gentrification, revitalization and changing accessibility to infrastructure.

A pertinent question to be posed at this point is, whether these findings are corroborated by the results of other, future oriented studies on urbanization and spatial socioeconomic development in Europe. An appropriate reference seems to be in particular the ESPON 3.2 (2007) project on: *Scenarios on the territorial future in Europe*. In that study the alternative projections, till the year 2030, are driven by a set of assumptions concerning such external factors as: climate change, demographic ageing and rising cost of energy. At the same time, these scenarios differ mutually with respect to other, partially exogenous factors (economy, transportation, governance) and, aside from the baseline – the trend scenario, in terms of the basic policy approaches, those relating to competitiveness versus cohesion oriented goals.

It can be noted that the spatial patterns of potential quotient values, according to the A1 and A2 scenarios, correspond to the ones generated by the ESPON trend scenario (concentration of urban and economic development in the so-called Pentagon area and its extension towards the east), and, albeit to a somewhat lesser extent, to the competitiveness oriented scenario. Conversely, the relatively diffused patterns of the potential quotient values, as represented by the B1 and B2 scenarios, are paralleled by spatially deconcentrated urban and economic development in the EU – the patterns that evolve in accordance with those ESPON projections that are based on assumptions concerning the increasing importance of territorial cohesion goals. This, among others, indicates the competitiveness rather than the cohesion orientation of the actually prevailing policy approaches, although some doubts are still left as to their spatial consequences in a longer term perspective (Korcelli, 2008a). At the same time, this points to a somewhat abstract, i.e. a less realistic nature of those territorial development scenarios that are built around the cohesion oriented policy objectives.

Table 3.5. Correlation coefficients between potential quotient values and RUR variables

	U_PZ_A	P_PZ_A	R_PZ_A	AS_KM2	U_PZ_AS	P_PZ_AS	R_PZ_AS	UA	PA	RA	UAS	PAS	RAS
QVD00	0,3854	0,4211	-0,4902	0,7254	0,5001	0,3770	-0,5577	0,7981	0,5559	-0,1121	0,7919	0,7265	-0,0308
QVDH00	0,3853	0,4208	-0,4900	0,7259	0,5002	0,3770	-0,5578	0,7986	0,5559	-0,1113	0,7923	0,7265	-0,0300
QVDHB1	0,4141	0,4242	-0,5103	0,6795	0,5337	0,3636	-0,5722	0,7836	0,5107	-0,1404	0,7851	0,6756	-0,0677
QVDB1	0,4144	0,4241	-0,5103	0,6787	0,5337	0,3632	-0,5720	0,7829	0,5100	-0,1412	0,7845	0,6749	-0,0681
QVDHA1	0,4060	0,4206	-0,5032	0,6859	0,5275	0,3652	-0,5691	0,7847	0,5173	-0,1332	0,7840	0,6836	-0,0617
QVDA1	0,4066	0,4207	-0,5036	0,6851	0,5276	0,3649	-0,5691	0,7841	0,5169	-0,1340	0,7835	0,6831	-0,0624
QVDA2	0,4120	0,4195	-0,5058	0,6813	0,5306	0,3619	-0,5692	0,7829	0,5127	-0,1358	0,7834	0,6774	-0,0641
QVDHA2	0,4115	0,4194	-0,5055	0,6822	0,5304	0,3621	-0,5693	0,7836	0,5130	-0,1349	0,7840	0,6779	-0,0634
QVDHB2	0,4029	0,4157	-0,4987	0,6851	0,5236	0,3621	-0,5651	0,7818	0,5159	-0,1290	0,7812	0,6809	-0,0579
QVDB2	0,4033	0,4158	-0,4990	0,6844	0,5237	0,3619	-0,5650	0,7813	0,5156	-0,1298	0,7808	0,6805	-0,0585

Where:

U_PZ_A – share of urban area in total area,

R_PZ_A – share of rural area in total area,

U_PZ_AS – share of urban artificial surface in total artificial surface,

R_PZ_AS – share of rural artificial surface in total artificial surface,

PA – peri-urban area,

UAS – urban artificial surface,

RAS – rural artificial surface.

P_PZ_A – share of peri-urban area in total area,

AS_KM2 – artificial surface,

P_PZ_AS – share of peri-urban artificial surface in total artificial surface,

UA – urban area,

RA – rural area,

PAS – peri-urban artificial surface,

3.4. Location patterns of firms in an urban-rural region

Research on contemporary relationships between economic development and land use change, conducted within the framework of PLUREL and pertaining to the regional level, was oriented towards a number of specific, both theory and policy relevant questions. These included, among others, the interdependence between the urban structure and commuting to work patterns, the decline and revitalization of inner city districts following the processes of economic restructuring, as well as the nature, origins and resolution of land use conflicts that take place in peri-urban zones of rural-urban regions.

In this section relationships between the urban, peri-urban and rural zones of an urban-rural region are looked at using the micro-level approach, namely from the perspective of location factors and location patterns of private service-sector units. It may be assumed (see, for example, Śleszyński, 2007), that data concerning those factors represent significant information on spatial structures and patterns of linkages, both between cities and within individual regions. The analysis pertains to the region of Warsaw, one of PLUREL's case study regions which, for the purpose of this inquiry, is assumed to correspond to Mazowieckie voivodship – one of 16 upper-level administrative regions of Poland; a NUTS-2 level unit in terms of the European-scale territorial division.

The data presented below are derived from a special survey conducted in 2009, covering a set of six hundred, randomly selected private enterprises in the so-called advanced service sector (see: Hall and Pain, 2006). The firms inquired were among others those active in the sphere of higher education, information technology, logistics, legal and market consulting, advertising, as well as tourism and recreation. Out of the total number, three hundred firms had their location within the city of Warsaw, and the remaining three hundred – in the other, urban, rural, and urban-rural municipalities in the region. Small enterprises, employing less than 50 persons, accounted for the majority of units: 230 in the case of Warsaw-based firms, and 212 among those, located outside the main city.

Location appeared to be an important factor in determining the spatial range of firms' activity. While all the enterprises with the location in Warsaw were providing their services within the city, this was the case of half of the firms located beyond its borders. Not surprisingly, the main markets for the latter firms were contained in peri-urban and rural areas, as well as in small and medium-sized towns situated in the Mazovia region. At the same time, the market range of two-third of Warsaw-based firms extended into these areas. Six out of ten of those firms reported having customers in other regions as well, whereas in the case of hinterland-based enterprises this relation was one to two. Conversely, an international activity, including market range was more often noted among the firms with out-of-Warsaw location.

Forty percent of all firms covered in the survey have changed their location over the last several years, this proportion being equal for the Warsaw-based

and the hinterland-based enterprises. The shifts in location were relatively frequent among those firms whose market range was identified as local. In the case of Warsaw, the overwhelming majority of moves took place within the city administrative borders; for firms characterized by hinterland location these changes typically involved relocation between urban places within the region. Moves out of Warsaw were more frequent than those in the opposite direction. Their destinations, in addition to Warsaw's peri-urban communities, included also more distant, larger towns situated in the hinterland zones. A change of location has allowed some firms to extend their market range, typically from local to regional.

Although the general propensity to relocate was found to be basically the same for the Warsaw-based and the hinterland-based firms, the two groups of enterprises differed markedly in terms of the respective location and relocation factors. While both in the case of Warsaw and the other parts of the region the market factor, i.e. accessibility to customers was identified as factor number one, it was indicated as such by more than three quarters of all respondents from Warsaw, in comparison to only one-third of firms with a hinterland (including peri-urban) location. Factor number two for Warsaw firms turned out to be location of, or proximity to the owners' place of residence. This factor, especially important in the case of very small units, was related to the high level of rental and maintenance costs of office space in the main commercial districts of the city.

Further location factors, frequently indicated in the responses by the firms from Warsaw, were those, usually connected with large cities, such as development potential, presence of other firms in the given branch (agglomeration factors), business infrastructure, prestige. For firms situated in the peri-urban and hinterland areas the latter factors had rather limited consequence. Instead, measures of spatial accessibility, namely: time-distance to major transportation routes, to the airport, and nearness of Warsaw, came out as crucial location determinants. Other major factors identified in the survey included proximity to suppliers and cooperating firms, and also the availability, as well as the price of land.

In the category of firms with the recent experience of moving, several location factors turned out to be of critical importance. In the case of Warsaw-based enterprises these were: situation with respect to traffic thoroughfares, and operation costs. Hence, their decisions to relocate were typically determined by improvement of accessibility to customers and cooperating firms, and, on the other hand, by reduction of office leasing cost, or land rent paid. Firms located in the region identified the corresponding factors as: proximity to cooperating firms, availability of land plots and buildings, as well as of technical infrastructure, including time distance to the airport.

The role of proximity to cooperating firms, which appeared as a major factor in the relocation decisions, points towards the formation of local, inter-firm production linkages. These linkages develop across the city of Warsaw administrative boundaries, as well as within the peri-urban areas and in the region's hinterland zones. With respect to directions of firms' relocation, a certain measure of balance can be observed. While some enterprises, originally settled in the periphery, choose new locations that are closer to the city, frequently in the metropolitan ring, other firms depart from Warsaw for smaller urban centres

situated in the hinterland zones. Such firms tend to be attracted to these places by lower operational costs, when the latter are coupled with the availability of modern telecommunication infrastructure, as well as by the growing local markets for advanced services. In the light of the survey results, the economic backwash effects tend to coincide with, rather than dominate over the spread effects at the regional level.

Another conclusion that can be derived from the study pertains to city-region relations, as interpreted in terms of firms' activity range. As the data herewith presented suggest, the organization of economic activity within the region is not just a reflection of the distance, i.e. accessibility to its urban core. Warsaw is neither the main recipient, nor the intermediary in the case of many specialized services produced in its hinterland. For a major part of these activities, their markets tend to be of local, but also of extra-regional range. In this sense, economic and land use relations between the urban, peri-urban, and rural-urban zones in the region give evidence of some interdependence, rather than the total dominance of the core.

4. THE LOCAL DIMENSION IN THE DEVELOPMENT OF URBAN-RURAL REGIONS

4.1. Research assumptions and methodological approach

4.1.1. Peri-urban areas

As recounted in the introductory chapter of this report, the rural-urban regions are formed by spatial clusters of three interrelated regional sub-systems – the urban core, the zone of transition from urban to rural areas that composes its peri-urban surroundings, and the rural hinterland. Peri-urban areas are defined in different ways. Common for these definitions is, that every peri-urban area is contained within a larger urban system, and the way it is being developed is crucial for the system's sustainability (Loibl and Toetzer, 2003; Gallent, 2006; Couch *et al.*, 2007). The definitions also underline the increasing urbanization pressure on peri-urban areas, and their importance for quality of rural-urban regions' ecosystems. The situation of peri-urban areas is determined by structures of subsystems that form the rural-urban regions. Their pattern may be dispersed or concentrated. They may also be characterized by different physical accessibility, and by other specific features that make them more or less attractive for residential, service and production functions. Plans concerning future development of peri-urban areas are important both for individual places and for the whole rural-urban region. They have an impact on functional structure of the region, its potential for sustainable development and territorial cohesion.

The peri-urban areas are neither strictly urban nor rural. The dichotomy of urban and rural started to blur with the development of modern industry, mass transportation systems, and the rising number of private automobiles. The countryside close to cities became a potential place for living, recreation and also working, for former urbanites. Cities gradually developed functional relationships with their surroundings, which were then transformed into areas characterized by a mixture of urban and rural features.

The term "peri-urban" has a broad and slightly vague meaning. It is often used to describe newly urbanized areas at the fringes of cities (McGregor *et al.*,

2006), situated beyond, and less intensely developed than the suburban ring. It is also understood as a mixed area under urban influence, but with a rural morphology (Caruso, 2001). Most often a peri-urban area is generally defined as a transition area moving from strictly rural to urban, related to a high pressure towards urban development (Bertrand, 2007). Some definitions emphasize the formation of a new kind of landscape, or point out the fact of emergence of urban activities in rural areas, which have important social and economic aspects (Briquel and Collicard, 2005). Thus, peri-urbanization should be seen and analyzed in different dimensions: morphological, functional, ecological, social, and economic.

The peri-urban areas become a distinct geographical type of territory, that is complex and evolving. They change shape and functions, contributing to changes in rural-urban regions in terms of paths of the settlement system development, including location of infrastructure, housing, industry, agricultural production, and open space. Evolution of peri-urban areas depends on many factors that result from social and economic phenomena and processes taking place in urban, peri-urban and rural areas. The nature of these phenomena and the processes have an impact on relationships between urban, peri-urban and rural areas. In case of urban and peri-urban areas the relations concern, in one direction, pressures on space for housing, business, and infrastructure. In the other direction, the peri-urban zone to develop requires services and urban markets. In case of peri-urban to rural relationships there is a demand for food, water, other natural resources or assets needed for tourism development. These are counter-balanced by relationships of employment and access to services. There are also linkages between individual peri-urban areas. Their nature is shaped by specific features of these areas, as well as their urban and rural surroundings.

From the perspective of development policies, strategies and plans, the peri-urban areas comprise an exceptional challenge because of their complexity, and because they function in the network of relationships listed above. Development agendas for urban, peri-urban and rural areas are obviously different. However, development policies, strategies and plans must respect presence and unique nature of peri-urban area, since this area is an outcome of activities of different actors, not necessarily located in there.

In this chapter local dimension of rural-urban region development is addressed using the case of the Warsaw Metropolitan Area. The perspective held by inhabitants and local governments on development and functioning of peri-urban areas was adopted. The goal of this chapter is to present how peri-urban areas are perceived and evaluated, what are the driving forces of their development, what expectations are formulated in terms of their future development, and what development problems can be identified as the most challenging. Answers to these questions will allow us to assess the role of peri-urban areas in the development of the rural-urban region.

In our studies peri-urban areas were defined as areas where urban and rural landscape, functions, and development border on each other. Because of the level of spatial aggregation of data and information available, it was decided that peri-urban areas in the WMA would be identified with municipalities (*gmina*)

that meet certain criteria of peri-urban status concerning municipality's economic situation, the functions performed, the land use pattern, and location within the WMA.

4.1.2. Warsaw Metropolitan Area as an urban-rural region

The Warsaw Metropolitan Area is situated in the center of Mazowieckie voivodship, the largest administrative region in Poland (Fig. 4.1). The settlement network of the region includes 85 towns, as well as almost 9 thousand rural settlements. The region is an example of the rural-urban region that experiences “dual-mode” development – dynamic in urbanized territories and of much slower pace in rural



Figure 4.1. The Warsaw Metropolitan Area in 2009

ones. The most dynamic development processes in the region are observed in the Warsaw Metropolitan Area. This is the area of intense urbanization pressure and of potential conflicts related to land use. The strongest urbanization pressure takes place in these municipalities, which possess the best environmental conditions, open spaces, forests, valuable land for agricultural production, and that are therefore attractive for potential migrants.

The Warsaw Metropolitan Area is the core part of the rural-urban region of Mazowieckie voivodship and can itself be considered as a rural-urban region of smaller scale. The WMA possesses all features that make it meeting the criteria of delineation of rural-urban regions. It encompasses not only intensely urbanized areas, but also agricultural, typically rural areas as well as open spaces and green areas, including Kampinoski National Park. The WMA consists of 72 municipalities, including Warsaw (Fig. 4.2). The WMA is diverse in terms of functions, their location, and land use patterns (*Studium Planu...*, 2010). Additionally, divisions between urban and rural, as well as tensions resulting from the current land use scheme and urbanization pressure make the area a perfect laboratory for the study on local dimension of rural-urban regions' development.

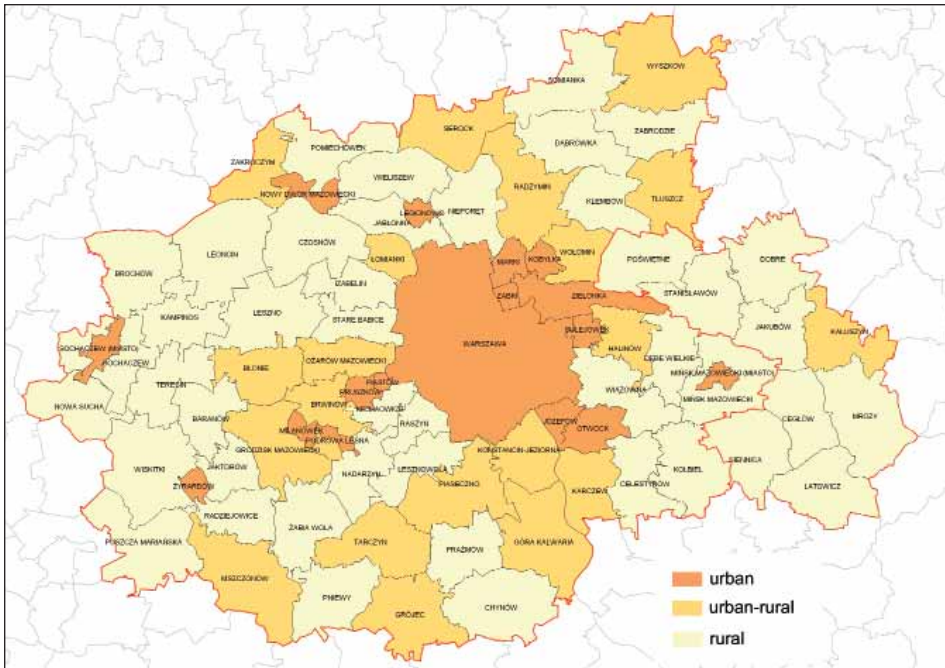


Figure 4.2. Types of municipalities in the Warsaw Metropolitan Area

Source: *Studium Planu ...* (2010).

The WMA constitutes a large labour market and offers a wide range of services for the inhabitants. The WMA is also the most attractive part of the Mazowieckie voivodship for investors. A huge consumer market and proper conditions for busi-

ness establishments, their development and expansion, are factors attracting firms to the WMA. Migrants looking for jobs in Warsaw often decide to settle in municipalities within the WMA, both those located next, or close to Warsaw's borders. There is also a process of migration from Warsaw to the suburban zone and the further situated areas that offer better living conditions. Most municipalities, even the rural ones, where migrants settle building or buying houses and apartments, have plans to expand the areas for residential functions (*Studium planu...*, 2010).

Still, agricultural production is present in the WMA. In the distance of several kilometers from Warsaw borders one may find traditional, small farms that are the main livelihood of rural households. Landscape of the villages, where these farms are located changes continuously over the last years. The urbanization pressure appears in new parts of the WMA, and will continue to grow due to migration flows and spatial behavior of firms.

Detailed analysis of mosaic pattern of land use in the WMA (subdivided into municipalities) allowed us to identify the following six categories of municipalities, with different land use scheme: urbanised municipality (dominated by built-up areas), urbanising municipality (experiencing urbanization pressure reflected in changes of land use pattern), traditional agricultural municipality (with prevalence of arable land and traditional rural economy), diversified agricultural municipality (mixture of land use pattern and activities related to agricultural production), modern agricultural municipality (dominated by orchards), and forest municipality (dominated by forests and green areas).

As presented later in the chapter, these categories were used in the process of identifying types of peri-urban areas and in selection of municipalities for in-depth studies of peri-urban development.

4.1.3. Research assumptions, methodology adopted and methods applied

As described above, the WMA is internally strongly differentiated in terms of location of functions, land use pattern and attractiveness for residential and business purposes. This differentiation impacts upon urbanization pressure, quality of life, and development policies. Development trends of the WMA, its internal differentiation, and the identified categories of municipalities with different land use scheme, set the basis for formulation of the following research assumptions.

1. Functional differentiation of the WMA is translated into specific types of peri-urban areas in the region.
2. Specificity of peri-urban areas depends on their distance from Warsaw, physical accessibility and local development conditions.
3. Perception of peri-urban areas (e.g. assessment of living conditions, preferred future development options) is diversified and depends on the type of peri-urban area.
4. Specificity of peri-urban areas has an impact on development goals and priorities.

The rural-urban regions are formed, as was depicted earlier, by spatial clusters of three interrelated regional sub-systems – the urban core, the zone of transition from urban to rural areas that composes its peri-urban surroundings, and

the rural hinterland. More specifically, in the rural-urban region one may distinguish intensely urbanized areas that are represented by urban core (downtown and cities' other central areas, inner urban built-up areas, and suburban areas located next to cities' borders). Another distinguished type will be urban fringe, which takes form of a zone along the edges of the built-up area and comprises a scattered pattern of lower density settlement areas, as well as areas with other functions, including open space. Part of rural-urban region is also urban periphery: a zone surrounding the main built up areas, with a lower population density. This can include smaller settlements, industrial areas and other urban land-uses. The last component of the rural-urban region is rural hinterland: rural areas surrounding the peri-urban area situated within the rural-urban region (Ravetz, 2010). Looking at the composition of rural-urban region's subdivisions one may state that peri-urban areas can be found literally everywhere within the region's borders. Thus, a number of questions appears: what and how many types of peri-urban areas exist? How to identify peri-urban areas and link their current status to their origins? What are similarities and differences between them? Are there any regularities concerning location of peri-urban areas of specific type?

All terms describing what is contained in the rural-urban region are present in the geographic literature. However, they can be defined, delineated and understood in different ways depending on the regional and local context. Besides, these more specific subdivisions of the rural-urban region may overlap and their borders can not be always precisely marked. Capacious and broad term "zone of transition from urban to rural areas" suggests an approach that focuses not so much on identifying the position of peri-urban areas in the complex spatial structure of the rural-urban region, but on searching for factors that shape specific types of peri-urban areas that are contained in the "zone of transition", and on identifying these types. This approach was adopted in our studies.

In order to investigate the local dimension of rural-urban region development, and to assess the situation and the role of peri-urban areas in this process, the studies were conducted in three phases. In the first phase identification of types of peri-urban areas was performed. In the second phase municipalities representing specific peri-urban types were selected for in-depth studies, which were conducted using the method of face-to-face interviews. In the third phase analysis of strategic planning documents and interviews with representatives of local and regional governments were carried out. Results of discussions conducted during workshops, organized for local government representatives and researchers dealing with problems of metropolitan areas development supplemented the information gathered in the research process.

In this chapter we focus on results of the second phase of studies, and present some additional comments concerning results of analysis of documents as well as conclusions of interviews and workshops' discussions.

4.2. Rural-urban region and peri-urban areas – the case of the Warsaw Metropolitan Area (WMA)

4.2.1. Types of peri-urban areas in the WMA

Identification of types of peri-urban areas within the WMA was based on analysis of data and information on municipalities – their economic conditions and characteristic features of economic, social and spatial development². Three basic types of peri-urban areas within the Warsaw Metropolitan Area were identified and named as follows: type A – peri-urban zone nucleus, type B – peri-urban inner zone, and type C – peri-urban outer zone. Names of identified types suggest location of municipalities within the WMA and point out to the fact that, despite of internal differentiation of the WMA there are some regularities and similarities when it comes to formation of peri-urban areas in different parts of the rural-urban region.

The peri-urban zone nucleus type is represented by those municipalities, in which urban functions are well developed and located in cities that play the role of important local centers, providing jobs opportunities and services for their inhabitants and for inhabitants of neighbouring rural areas. These municipalities belong most often to the administrative category of urban-rural municipalities. Functional relationships with Warsaw exist, but many needs of the inhabitants are met by the local service providers. Type A municipality is usually well equipped with technical infrastructure. The central town of the municipality and other towns located there are surrounded by open space. These municipalities are also characterized by clear urban edge, understood as a boundary between built-up areas and open space.

Municipalities of type B – *peri-urban inner zone municipalities* – are characterized by mixture of urban and rural functions. Functional relationships of these municipalities with the central city of the rural-urban region are usually stronger than in case of type A municipalities. In legal terms these municipalities belong most often also to the administrative category of urban-rural municipalities, but they may also have the status of rural municipalities. One will find in these municipalities open space like in type A municipalities, although the landscape is more rural, with fields and other areas used for agricultural functions. Settlements units are smaller and dispersed. A mixture of rural and urban functions

² The following features were analyzed: level of technical infrastructure development, number of economic entities and profiles of their activities, employment in economy sectors, intensity of construction activities, % of areas covered by land use plans, changes in number of population and migration flows, quality of natural environment conditions, main functions performed by municipalities, land use pattern (as distinguished in the specific case of the WMA: urbanised, urbanising, traditional agricultural, diversified agricultural, modern agricultural, and forest municipality), location within the WMA and transportation accessibility.

results in a specific landscape of these municipalities, with easily noticeable residential functions (new developments), along with typical rural features.

The third type is *peri-urban outer zone municipality*. These municipalities are located in this parts of the WMA which are dominated by agricultural functions. Legally, these municipalities belong usually to the administrative category of rural municipalities. They are located in these parts of the rural-urban region where the urbanization pressure is lower than in case of types A and B municipalities. Functional relationships with Warsaw are weaker. The landscape is typically rural.

4.2.2. Selection of municipalities for in-depth studies and their characteristics

Individual municipalities possess some unique features that may have an impact on their development paths. These include: strategic investments successfully carried out by local or regional governments, innovative local political leadership, natural resources crucial for economic development, land available for development, etc. Thus, the selection of municipalities for in-depth studies was not an easy task. In order to touch on issues of universal character, that are important for the development of rural-urban regions generally, not just for the WMA, it was decided to apply in this selection an additional set of three criteria:

- degree of land pressure generated by rapid suburbanization and urban sprawl, which brings changes of functions and, as a result of appearance of new functions, consequently alters the pattern of land use, influences living conditions and development;
- presence of high value nature at risk, which is connected with conflicts of functions resulting from the increasing intensity of land use, and from proximity of conflicting functional zones;
- presence of agricultural land under pressure, which results in conversion of agricultural land into plots to be developed for other uses.

Eventually, the following three municipalities were selected for in-depth studies: Błonie, Halinów and Leoncin (Fig. 4.3).

The municipality of Błonie is an example of the peri-urban zone nucleus type. This is a municipality with a compact town in the centre, surrounded by a high quality natural environment with strong urbanization pressure. It is characterized by dynamic development processes, and the level of development above average in the Mazowieckie voivodship, as well as in the WMA. The town of Błonie functions as a local service center. The municipality is attractive for investors and conducts very proactive development policies. Błonie has good transportation connections with Warsaw and good access to other towns in the western part of the WMA.

The municipality of Halinów is an example of the peri-urban inner zone type: a municipality with an average level of economic development and a mixture of functions. Halinów experiences strong urbanization pressure. This is a municipality with a significant number of recent in-migrants – people who

have moved to Halinów, mainly from Warsaw, looking for good location to build, or buy a house in the vicinity of Warsaw, in an area offering high quality natural environment. Halinów is an example of a peri-urban inner zone municipality under strong influence of Warsaw. In the case of Halinów the access to Warsaw via road network is relatively poor. However, Halinów has good train connection with Warsaw.

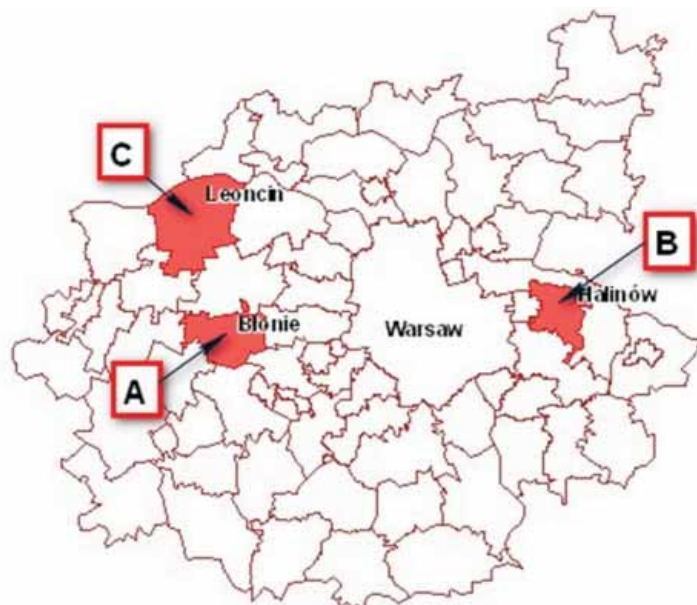


Figure 4.3. The case study municipalities: Błonie (type A), Halinów (B) and Leoncin (C)

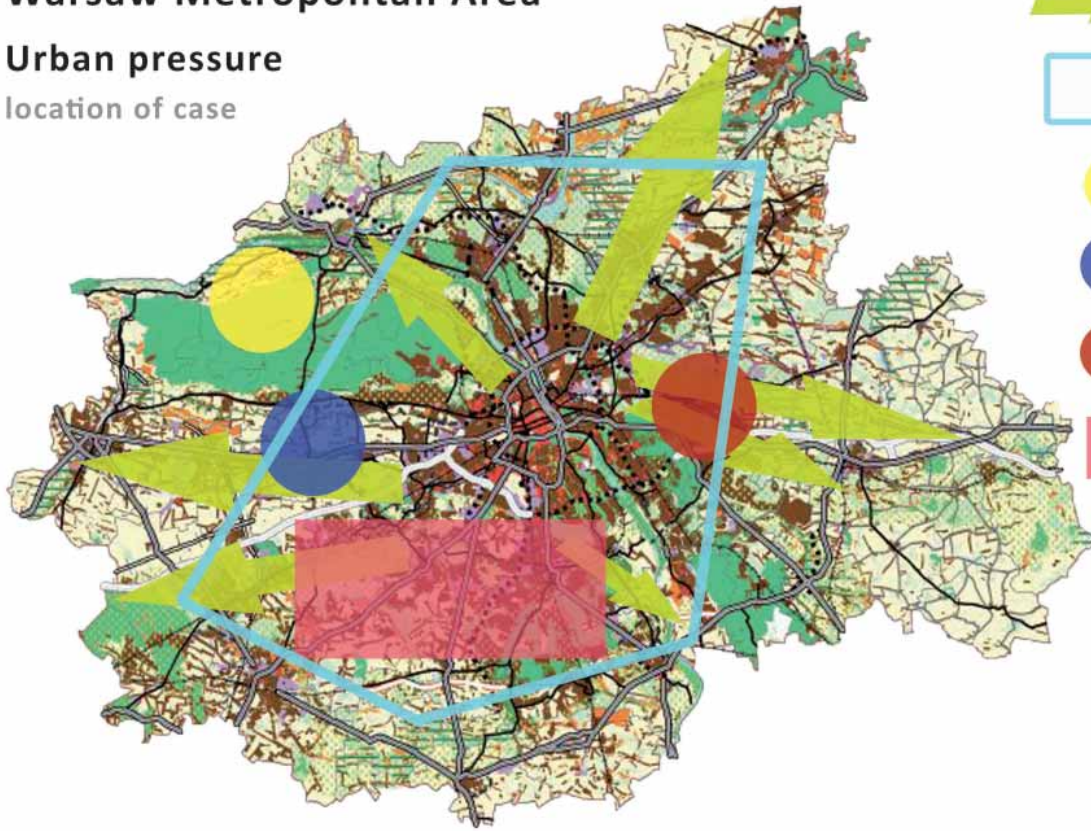
Leoncin is an example of the peri-urban outer zone type. This is a rural municipality, with weak urbanization pressure and high value open space, including the protected area of the Kampinoski National Park. As a municipality with peripheral location, adjacent to the large forest complex, Leoncin has very poor access to transportation networks. Poor transport accessibility results in relative spatial and functional isolation of the municipality.

Błonie and Halinów are located in this part of the WMA which experience the most significant anthropogenic changes. According to the spatial development plan for the Mazowieckie voivodship, and the planning documents prepared for the WMA, both municipalities are located in planned zones of further urban functions development. Leoncin is located in the peripheral part of the WMA (Fig. 4.4) and is separated from the urban core of the region by complexes of forests and agricultural land. For planning purposes there were four zones in the WMA distinguished to create a spatial framework to be used to provide guidelines on how to develop these areas (Fig. 4.5). The four zones are as follows: the intensive urbanization zone (encompassing urbanized municipalities), supplementary development zone (encompassing urbanized and less urbanized municipalities), the

Warsaw Metropolitan Area

Urban pressure

location of case



planned directions of urban functions development



area with significant anthropogenic changes



Leonicin suburban outer zone



Blonie suburban zone nuclei



Halinow suburban inner zone



area of dynamic suburbanization and urban sprawl

adaptation zone (encompassing traditional agricultural, diversified agricultural, and modern agricultural municipalities), and the open zone (encompassing traditional agricultural, modern agricultural, and forest type municipalities). Błonie belongs to the intensive urbanization and supplementary development zone. Halinów is a part of the supplementary development zone, and Leoncin a part of the open space zone. According to spatial development plans, the intensive urbanization zone is the zone where concentration of urban functions is allowed, and in fact preferred.

Thus, new investments shall be located first of all in this zone. Supplementary development zone is the zone of average intensity of development, and shall be a target for new investments as the next, after the urbanization zone. According to the plan in the open zone new constructions are forbidden. The only investments allowed are these related to current functions and development. The investments allowed concern rebuilding, modernizing, and renovating buildings and other constructions, and shall be related to the forms of land use that are subordinated to functions that are connected with, or respect the protection of natural environment. These rules open possibilities for Błonie development, similarly for Halinów, while Leoncin should keep the current state. However, spatial development plans prepared at the regional level do not play a role of binding provisions for planners at municipalities' level. In a non-hierarchical system of spatial planning they may suggest solutions, and serve as a base for reaching agreement by parties involved in preparation of local development plans. Municipalities are obliged to respect in their plans the location of public benefit investments, incorporated in regional plans. The character of land use in terms of functions, intensity, and forms of development depends on the municipalities, and are implemented as long as proposed solutions do not violate specific regulations of natural environment protection law, the building code and other legal regulations that are related to spatial development processes.

In the three municipalities selected for in-depth studies interviews with the total of 1200 respondents (400 interviews in every municipality) were conducted, using the face-to-face method. The survey took place in February and March 2009. The sample of respondents was drawn randomly from the population of 18 years old and above. Among the respondents were representatives of two towns (Błonie and Halinów) and all 86 villages situated in the three municipalities (24 in Błonie, 24 in Halinów, and 38 in Leoncin).

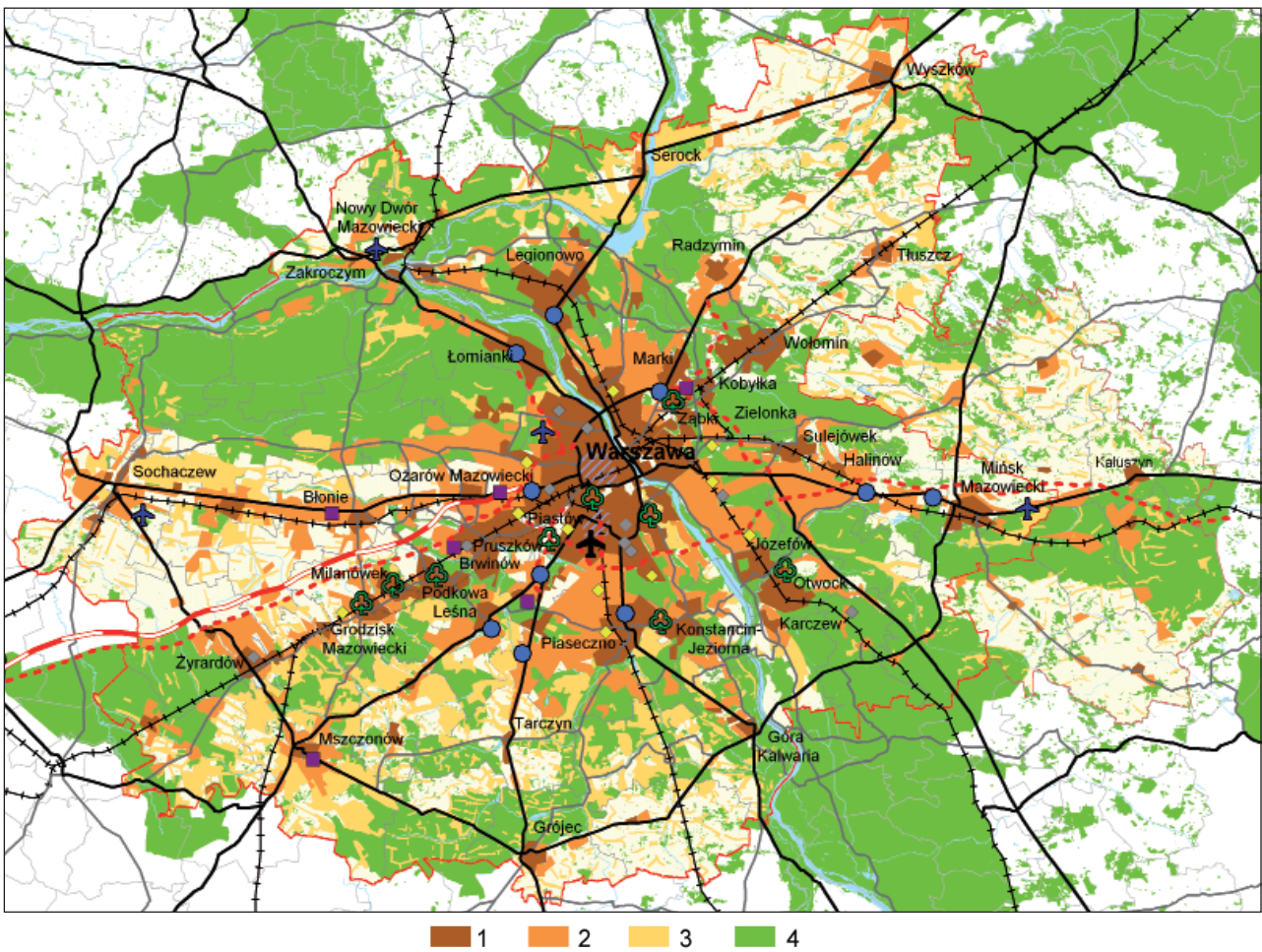
4.2.3. Characteristics of respondents

Municipality of Błonie

Half (49.5%) of all respondents from Błonie belong to mobile production age group (between 18 and 44 years), while 30% of respondents have the status of retired or pensioners. The sample is dominated by inhabitants with



Figure 4.4. The Warsaw Metropolitan Area: urbanisation pressure



secondary education (47%); university degree possess 14.3% of respondents. Most of the respondents work in firms with more than 50 employees. The main mean of transportation to work is car. Train is used by 5% of the respondents; 16% of those who still attend schools, commute to Warsaw. Only 2% continue education in Błonie. The others attend educational institutions in different locations.

Most respondents (83.6%) live in households of up to 4 members. Single person households constitute 10% of the total population; 90% of households occupy their own flats (40.5%) or houses (57.5). More than 50% of respondents have a car (14.4% have more than one car). 48% of respondents have access to internet at home. Financial conditions of households are rated as average and good (altogether 67.8%). The respondents are not socially active; only 6.8% of those surveyed belong to voluntary organizations. These are mainly voluntary fire brigades and church organizations. 14% of respondents moved to Błonie after the year 2000. The majority (76.3%) settled there before 1990. 85% of all respondents have lived in the municipality longer than 10 years. Only 7.5% stay in Błonie shorter than 5 years.

Municipality of Halinów

The majority of respondents (53.3%) belong to mobile production age category. Among participants of the study people with vocational education (37%) and secondary education (28%) dominate. University degree have 12% of the respondents. Most of those employed work in firms employing up to 9 persons. The main mean of transportation to work is car; train is used by 9% of respondents. Those who continue education do it mainly in Warsaw. 24% of respondents have the status of retired and pensioners.

Most respondents live in households of up to 4 members (79%), while 10% are single person households. 94% of households occupy single family houses, 63% have one and 20% two cars. More than half (51%) of respondents have access to internet at home. Financial conditions are rated as average and good (67%). Only 10% of those surveyed belong to voluntary organizations. These are mostly professional organizations and church organizations.

The largest number of respondents (71.4%) have lived in the municipality since at least 1990, while 17.8% moved to Halinów after the year 2000. 81.5% of all respondents live in the municipality longer than 10 years.

← Figure 4.5. Urbanization zone of Warsaw

1 – intensive urbanization zone (categories of municipalities: urbanized); 2 – supplementary development zone (categories of municipalities: urbanized and under urbanization); 3 – adaptation zone (categories of municipalities: traditional agricultural, diversified agricultural, modern agricultural); 4 – open zone (categories of municipalities: traditional agricultural, modern agricultural, forest type)

Source: *Studium Planu...* (2011).

Municipality of Leoncin

Most of the respondents (50.5%) belong to mobile production age group. Among the study participants people with basic vocational (32%) and secondary (21%) education predominate; 9% have university degree. Although Leoncin is a rural municipality, only 11% of all persons surveyed work in agriculture. Those working in industry, outside the municipality, work mostly in firms with more than 50 employees. The main mean of transportation to work is car (33%). Those who continue education, commute to Warsaw. Among all the respondents 29% have the status of retired and pensioners.

Most of the respondents live in households of up to 4 members (89%), while 10% of households are single person households. 90% of households occupy single family houses. 61% have one and 17% have two cars. 46% of respondents have access to internet at home. Financial conditions are rated as average and good (62%). 8% of those surveyed belong to voluntary organizations. These are mostly professional organizations and church organizations. 12% of the respondents have settled in Leoncin after the year 2000, and 85% have lived there for longer than 10 years.

This comparison of some basic characteristics of respondents shows many similarities, although the municipalities are very different. Ownership of cars, and their use as the main mean of transportation should be emphasized. Similar situation is in terms of the share of respondents with university degree, as well as the access to internet at home. The best educated respondents are those who live in Błonie. Błonie and Halinów have been more attractive as places of residence since the year 2000. However, newcomers have recently appeared also in Leoncin.

4.3. Peri-urban areas: perception and evaluation

As mentioned earlier, the notion of “peri-urban” is a vague one. *Rural*, *urban* and *suburban* are terms used most often not only in geographic literature, but also in common language, and are associated with specific features of landscape or life style. Are there any specific features of a peri-urban area? What are characteristics of the end of *urban* and the beginning of *rural*? That is, what is in-between and is it unique? Respondents were asked a question: *while going out of the city, when do you realize that you are entering the rural area?* Most respondents state that rural areas start when open, green spaces begin (Fig. 4.6). Those from Halinów point out additionally the appearance of forests, which are part of landscape of their municipality, and are seen as an important asset that has an impact on the municipality’s landscape attractiveness. Forests also occupy the large part of Leoncin municipality. However, this is not reflected in answers given. Instead, decreasing number of multi-family buildings was pointed out

as a characteristic feature. Type of housing developments is also pointed out by respondents from Błonie. They see rural areas as these where single family houses dominate. It is characteristic that a small number of respondents point out forms of development related to agricultural activities (farms) (in Błonie 3.5%, Halinów 3% and in Leoncin 2%).

It might be stated that the intensity of development (number of houses, their size and distance between them) is seen by all respondents as an important feature of rural areas. Generally, respondents perceive these areas as something opposite to urban ones, mainly in terms of type of housing and typical city landscape of streets with sidewalks. Respondents focus in their answers on landscape characteristics that are well known to them from their own municipalities and the areas surrounding them.

The question arises, whether and how the inhabitants of municipalities with peri-urban features associate characteristics of peri-urban areas with characteristics of the suburban zone, which is traditionally perceived as the main area of expansion of urban functions. Are there any differences between perception of the peri-urban area and the suburban zone? This is important to know, in order to identify factors, which potentially attract people to peri-urban areas and to suburban zones.

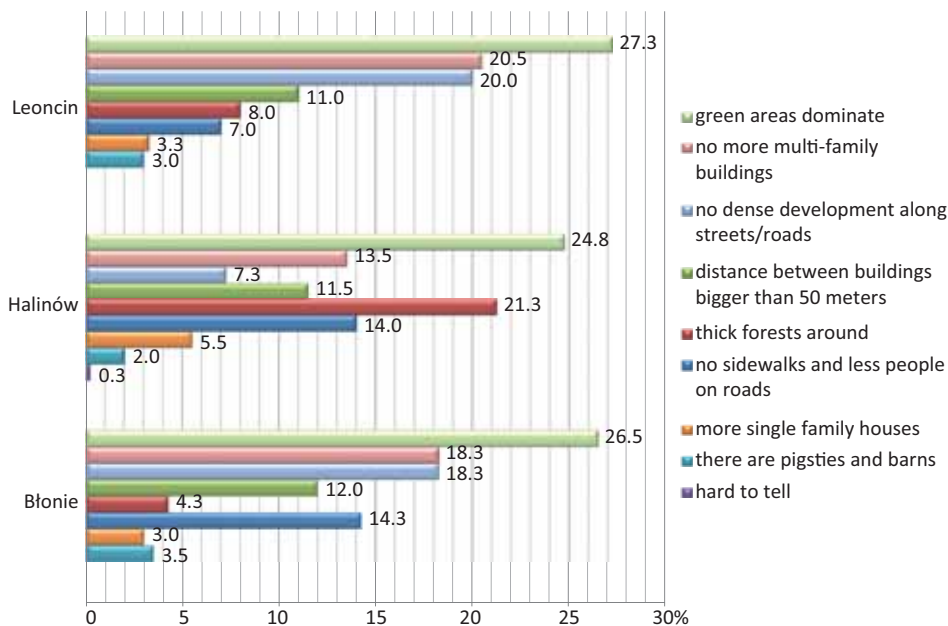


Figure 4.6. Perception and evaluation of peri-urban areas

While describing the suburban zone the respondents focus first of all on its location (answers pointing out *location next to Warsaw*, describing *range of this zone in kilometers* or in *time needed to get to Warsaw*) (Fig. 4.7). This is the kind

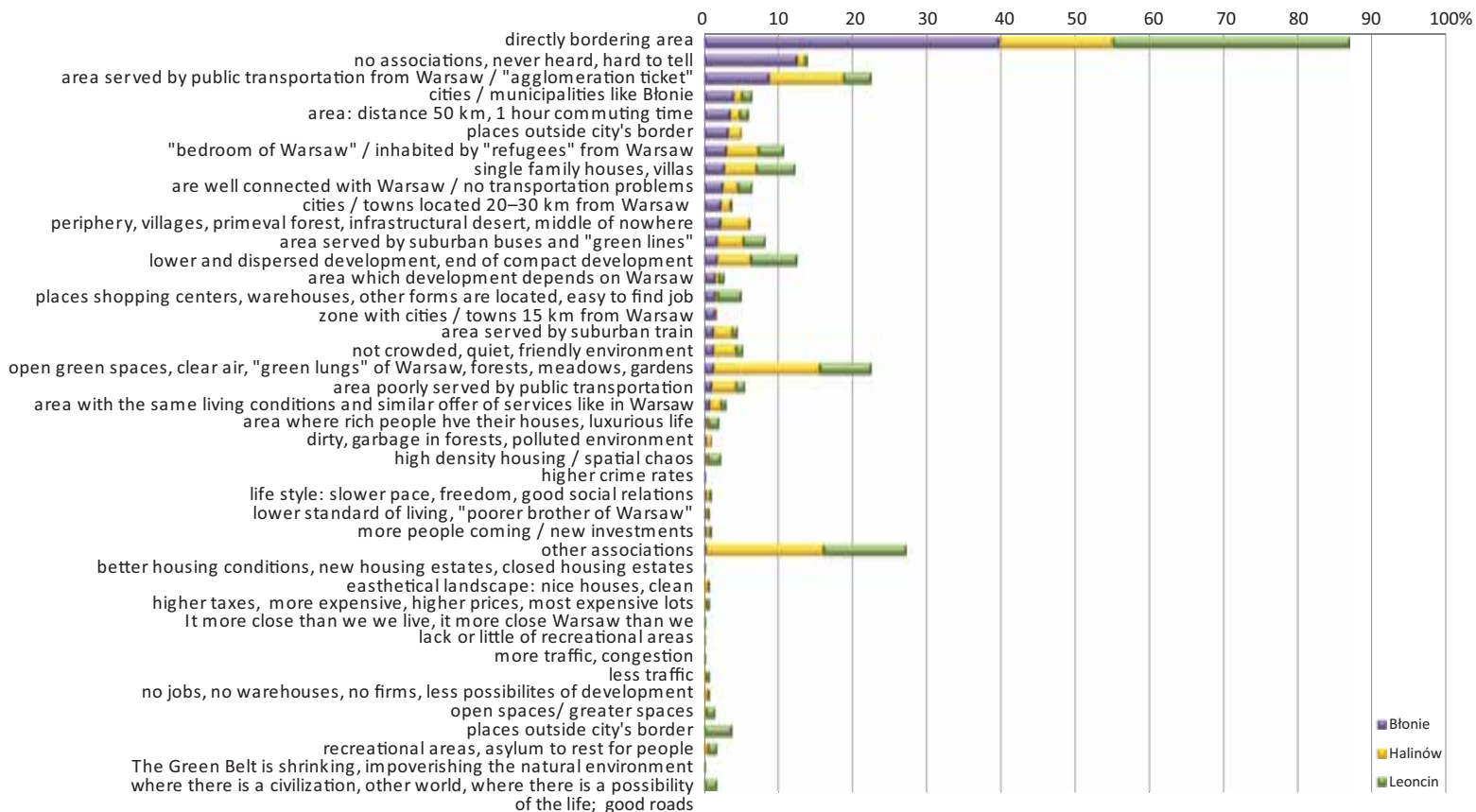


Figure 4.7. Features of the suburban zone

of perception where spatial dimension of urbanization processes dominates. Most of the respondents from all municipalities defined suburban zone as area bordering with Warsaw: in Błonie 40%, Leoncin 32%, and Halinów 15%. 14% and 7% of those questioned in Halinów and Leoncin stated that suburban zone is also associated with the type of land use, as the suburban zone has a large share of green areas, meadows, and forests. This zone is also associated by this group of respondents with better environmental conditions, especially clean air. Respondents from Błonie and Halinów mentioned additionally that suburban area is this one that is served by the Warsaw's system of public transportation (Błonie 8.8%, Halinów 10%). Respondents from these two municipalities listed also other attributes related to transportation, like train connection with Warsaw, "green lines" buses that connect Warsaw with recreational areas, etc. In Leoncin the percentage of respondent pointing out these features was lower. Suburban zone is perceived mainly from the perspective of its functions, whereas peri-urban area from the perspective of its landscape. And, surprisingly the term "suburban" turned out to be unknown, or difficult to define term for more than 10% of respondents in every municipality.

Suburban zone is perceived by the respondents as a very differentiated one, with advantages and disadvantages that have an impact on every-day lives of its inhabitants. The nature of processes of socio-economic and spatial development in Poland, after 1945, had a crucial impact on specificity of suburbs in Poland. During the period of 1945–1990 the political and economic systems determined their spatial and functional development. In the centrally planned economy decisions on location of functions (type, size of investments, etc.) were taken predominantly at the national level. Population mobility was limited due to different constraints, including poor quality of transportation system, small number of private cars, and lack of affordable housing. The level of wealth of the society was generally low. Thus, the freedom of choice of places of work or residence was also limited. Conditions of development changed in 1990. Decentralization, re-birth of territorial self government, the shift from centrally planned to market driven economy, development of housing market, increasing level of wealth of the society and increasing mobility have had an impact on the development of suburban zones. These areas experience continuous transformation. However, they still bear traits of the past of different kind. Hence, it was not surprising that some respondents from Halinów and Leoncin described the suburban zone as something that is worse than Warsaw: the "poorer brother" of Warsaw, where lower living standards prevail. Very few respondents see the presence of specific suburban life style. For years the suburban zone was just the place of residence for those who could not move to Warsaw. It seems that the suburban life style has not been developed yet. The only sign of it is commuting. Respondents from Leoncin state that suburban means periphery, living far from civilization. Conversely, small groups from Halinów and Leoncin see suburban zone as a place where affluent social groups have their luxurious houses, where taxes are higher and everything costs more. Respondents from Błonie see this zone as a place of location of shopping centers and warehouses. At the same time, they point out that this zone creates friendly, quiet, not crowded living environment. There are

contradictory opinions about transportation services: some respondents stated that this zone is served poorly by public transportation, some maintained that connections are well developed. Those, commuting regularly formulate more critical opinions. Respondents from Halinów were the largest group who saw the suburban zone as a “bedroom of Warsaw”, with lack of proper transportation connections and the environment that is losing its quality. Still, this zone is seen as having the recreational potential. Inhabitants of Leoncin see the suburban zone as important area for location of economic activities.

The answers obtained suggest that the suburban zone is perceived as not homogeneous, with different functions and different living conditions. Based on the information gathered, one may say that what makes the peri-urban areas unique and attractive for residents and potential settlers are assets of the natural environment. On the other hand, the suburban zone attractiveness may be seen in its articulated functional relationship with Warsaw and better, compared to intensely urbanized areas, environmental conditions.

Both types of areas: peri-urban and suburban, are areas where urban and rural functions are intermixed. However, the suburban area's mixture of functions results mainly from expansion of the central city. Demand for land and other resources comes firstly from the city. In case of peri-urban areas this mixture results from more complex processes, which derive to large extent from changes that occur in rural areas. These changes are outcomes of social and economic development processes, driven by exogenous, as well as endogenous factors. One result of these changes is supply of land released from agricultural production. Thus, it might be stated that suburban areas have been formed by urbanization processes understood mainly as spatial growth of continuously urbanized land, while peri-urban areas are product of urbanization processes understood predominantly as social and economic transformation of specific areas. In case of peri-urbanization the reasons, and the way the supply of land and other resources is generated is important because it will have a crucial impact on their future development and the consequences it will bring to the area.

The answers given by the respondents can not be explained by their socio-economic characteristics. They are related mostly to place of residence, alternative approaches to space as a value, and preferences concerning living conditions. Thus, the perception of peri-urban areas and suburban zone by inhabitants from Halinów and Leoncin is not surprising. These two groups of respondents value open space the most (Fig. 4.8). They have contacts with high quality natural environment and open space every day. Some of them have decided to move to these municipalities because of the quality of environment, and appreciate it as an important factor that has an impact on quality of life. Błonie offers limited access to environmental resources. However, respondents from Błonie value what they miss. Asked whether *‘the open spaces are as important to humans, and provide a positive aesthetic experiences as results of work of artists* they replied “strongly agree” (59.5%). Together with replies “agree” it was 82% of all answers. Respondents from Leoncin had no doubts answering this question. They appreciate unique environmental

conditions, which they enjoy. However, it is worth to mention that the number of those who contest this statement is relatively large comparing with two other municipalities. This might be related to the fact that environmental assets that are protected by law limit the scope of development plans, and may be perceived as a barrier to development.

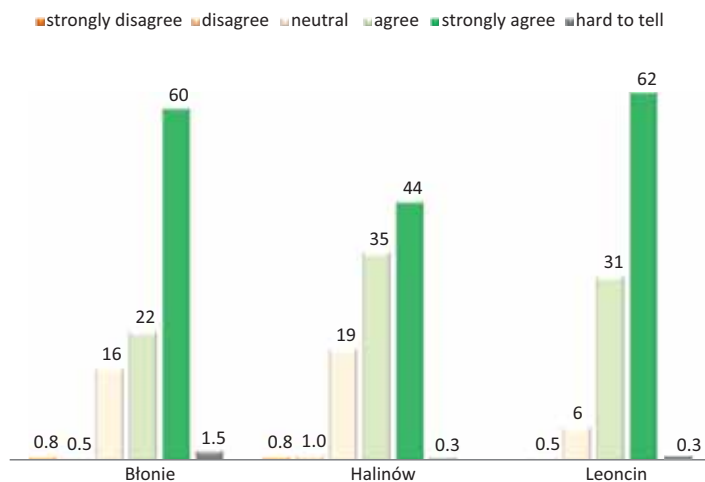


Figure 4.8. Open spaces as source of inspiration and positive experience (%)

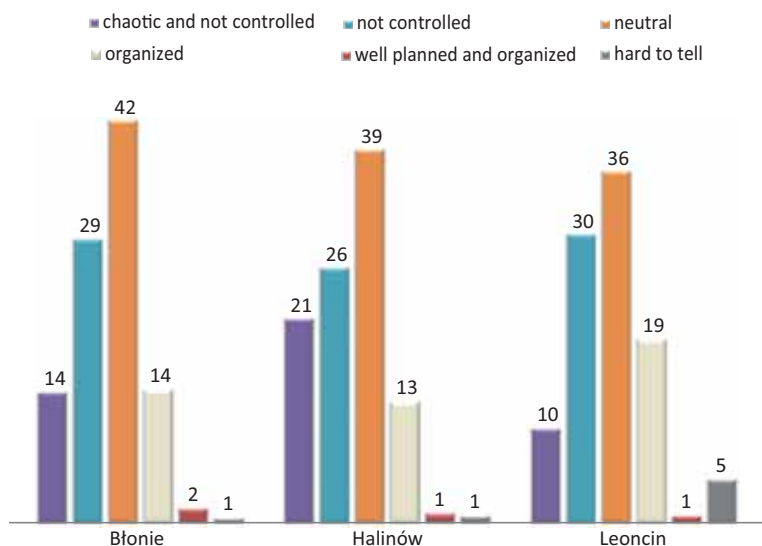


Figure 4.9. Evaluation of suburban development (%)

The respondents were very critical in their assessment of development processes of suburban areas. The most negative opinions were formulated by inhabitants of Błonie and Halinów (Fig. 4.9). Respectively about 43% and 47% stated, that this development is “chaotic and uncontrolled”. Only 10% evaluated development processes as well guided. In Leoncin 4.5% of respondents decided to answer “hard to tell”. This municipality experiences less urbanization pressure than the two other municipalities, and its results are not too harmful for the environment. The large part of the municipality is legally protected landscape where new developments are forbidden. These two facts explain detected hesitation expressed by some respondents. However, answers obtained prove that suburban development can be labeled as spontaneous and out of control. Spatial chaos is the most visible result of suburban development. The quality of landscape and environmental assets are decreasing. Absence of coordination of development efforts between municipalities results in increasing number of problems that inhabitants of suburban areas face in their every-day life (the issue of suburban area development will be addressed again later in this chapter).

The origin of peri-urban area is connected with the nature of development processes in rural areas; these processes are largely determined by the local development potential. Development potential is formed by different factors. Among them are human potential, structure of local economy, financial conditions of the municipality, location and natural resources, including quality of landscape. Landscape quality and attractiveness are important factors in the development of peri-urban areas, especially from the perspective of their sustainable development. They may be a driving force for development, making people interested in settling down in these places, or investing in businesses that make use of natural resources (eco-services). This interest may be translated into higher pressure upon land and other resources, which may result in decrease of their quality and, eventually, its value as an asset needed for specific purposes.

Błonie is an example of the municipality, inhabitants of which had problems with assessment of their areas landscape attractiveness (Fig. 4.10). Many of them have chosen neutral approach, or answered “hard to tell”. This is because Błonie consists of areas that are very differentiated in terms of the landscape. The city of Błonie is a compact town surrounded by agricultural land, and by smaller settlements that are predominantly rural. Most undecided responded resided in the city of Błonie. Those, who evaluated the landscape attractiveness much higher come from the countryside. Thus, again, types of answers depended on specific spatial location of respondents within the municipality. 37.7% of respondents stated that the landscape was neither attractive nor unattractive. For about 30% surveyed it was rather unattractive. In Halinów more than 56% expressed positive assessment of the attractiveness of the landscape of their municipality. Negative assessment was expressed by 25% of respondents. In Leoncin half of the respondents are fully convinced of the special attractiveness of their municipality landscape. Together with a group stating “rather attractive”, it gives 87% of positive opinions. This is objective reality in Leoncin and its inhabitants are aware of what they possess.

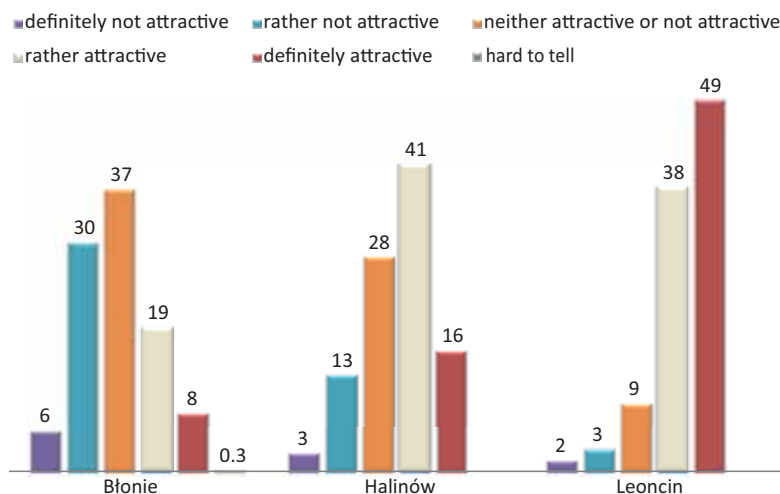


Figure 4.10. Landscape attractiveness of the municipality (%)

The assessment of landscape attractiveness was supplemented by evaluation of the quality of natural environment of the municipality. The rule observed is that the better the evaluation of landscape attractiveness, the better is the evaluation of the quality of natural environment (Fig. 4.11). Spectacular results brings the survey in Leoncin. Measures used to protect the most valuable environmental resources, and reduced urbanization pressure result in objectively the best environmental conditions (93% of respondents stated that quality of natural environment is “rather good” and definitely good”). Although Leoncin is also slightly differentiated internally when it comes to type and level of development, still respondents from different settlements voice the same opinions.

Attractiveness of landscape and quality of natural environment have, among other factors, an impact on the level of satisfaction from living conditions. In the case of Błonie this satisfaction is lower than in the two other municipalities (about 10 percentage points) (Fig. 4.12). The most satisfied are inhabitants of Halinów. This is the municipality that experienced in the last couple of years a sizeable inflow of migrants from Warsaw. New single family and semi-detached houses of new suburbanites are elements of the transformed landscape in this municipality. Halinów itself has town rights from year 2001. This is a good indicator of changes ongoing in the municipality. Most inhabitants of Halinów are satisfied, or very satisfied by living there. The situation in Leoncin is similar; however, in comparison to Halinów more people are dissatisfied with living conditions. The number of dissatisfied residents is similar to that from Błonie. Level of satisfaction from the place of residence is explained partly by the length of residence in the municipality. Such dependence was noticed in Błonie. In other municipalities time spent in municipalities did not play an important role in this respect. Satisfied or dissatisfied were both those living long time as well as those who declared that they moved in during the last several years. It is characteristic, that in Błonie dissatisfied respondents were those, who ranked both the attractiveness

of landscape and the quality of natural environment as poor. It means that environmental conditions are seen as an important component of living environment. Deficit of green areas in the municipalities under investigation will be discussed later in this chapter.

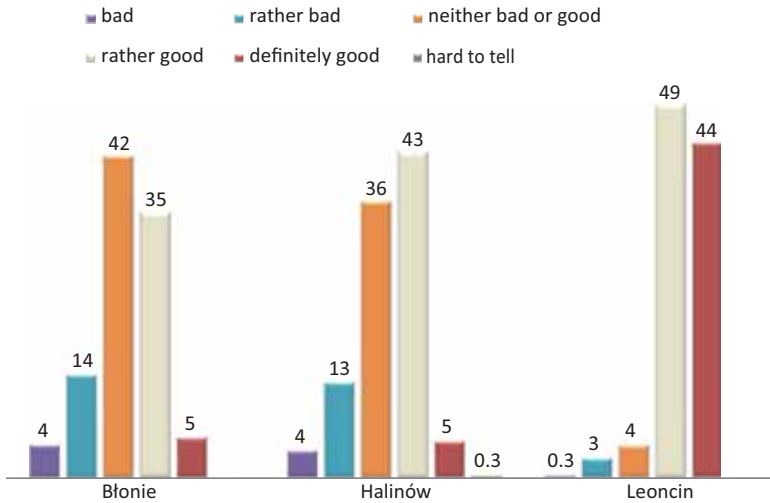


Figure 4.11. Evaluation of quality of natural environment (%)

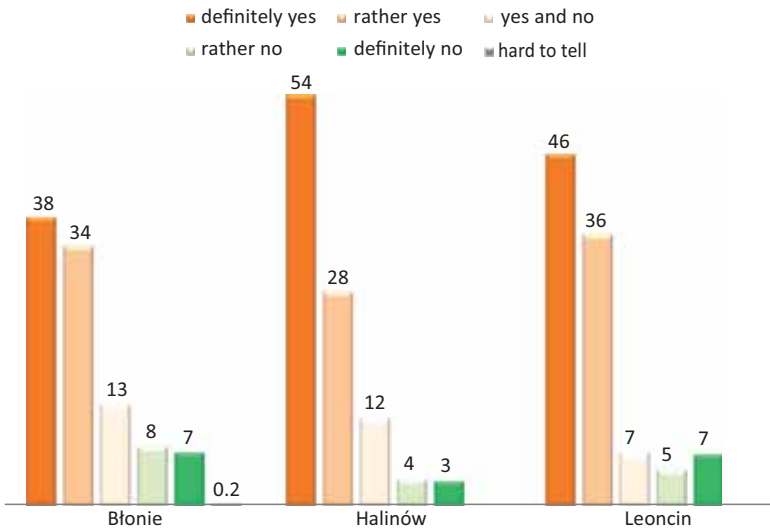


Figure 4.12. Level of satisfaction from the place of residence (%)

In Halinów and Leoncin higher level of satisfaction from place of living was accompanied by a better perception of landscape attractiveness and natural envi-

ronment quality. Residents also frequently emphasized the opportunity to live close to nature. The level of satisfaction was not affected by other factors, like e.g. access to services, or efficiency of public transportation.

Functionally integrated areas' offer is rich in terms of choice of places of residence, range of available services, job opportunities and others. Location of different functions within this area, and organization of transportation system have an impact on population mobility and the physical range of penetration of this area, when looking for specific opportunities and goods.

The more mobile and professionally, as well as socially active people are, the more interactions they are involved in. These interactions bring experience that makes the functionally integrated area known, familiar and understandable for people living there. It helps them to make better use of resources of different type that are located there. All the three municipalities are situated in the Warsaw Metropolitan Area that is regarded as a functionally integrated area. The question arises how inhabitants of peri-urban municipalities find themselves in this area. To answer this question we tested first of all their relations with Warsaw: the main urban center in the region. Physical and functional closeness is being translated into emotional one, that has important practical dimension, because "space of living" is then much larger than "space of residence". Disadvantages of the space of residence might be easily compensated by the fact, that other areas are perceived also as "ours", and as such they constitute space where we operate in every day working, using services, etc.

The majority of respondents from all the municipalities perceived Warsaw as a "rather close" or "very close" city. In Błonie, Halinów, and Leoncin it was respectively 58%, 71% and 53% of answers (Fig. 4.13). The number of respondents who perceive Warsaw as a remote city is the highest in Leoncin – 11.8%, and then in Błonie – 10.8%. Rating of closeness is associated with the scale of commuting to Warsaw. From Halinów more than 24% of respondents commute to work. Also those who continue education make use of educational institutions located in Warsaw. The number of people travelling to Warsaw to work from Błonie and Leoncin is much smaller; in both cases it is around 13%. A similar percentage of respondents declare that they do shopping in Warsaw. It seems that they do shopping on the occasion of travel to work. Small groups of respondents from Błonie and Halinów also regularly participate in cultural events organized in Warsaw. These contacts "bring" Warsaw closer to inhabitants of Błonie and Halinów. Some journeys to Warsaw may be called "forced trips", like in the case of commuting to work. Some are voluntary, to make use of services. Regardless of the nature of these trips, they shape the picture of Warsaw as a close city.

From answers about the closeness of Warsaw, and other questions gathered during the field studies it might be stated that Halinów is the best example of peri-urban area under urbanization pressure that is perceived as such, and rationally evaluated by its inhabitants. They are aware of the attractiveness of their municipality, they have specific preferences concerning living conditions, they enjoy living in Halinów, and they believe that suburbanization and urban sprawl in the Warsaw Metropolitan Area would continue, bringing more migrants from Warsaw; i.e. those who would be still working in the city, but live in Halinów.

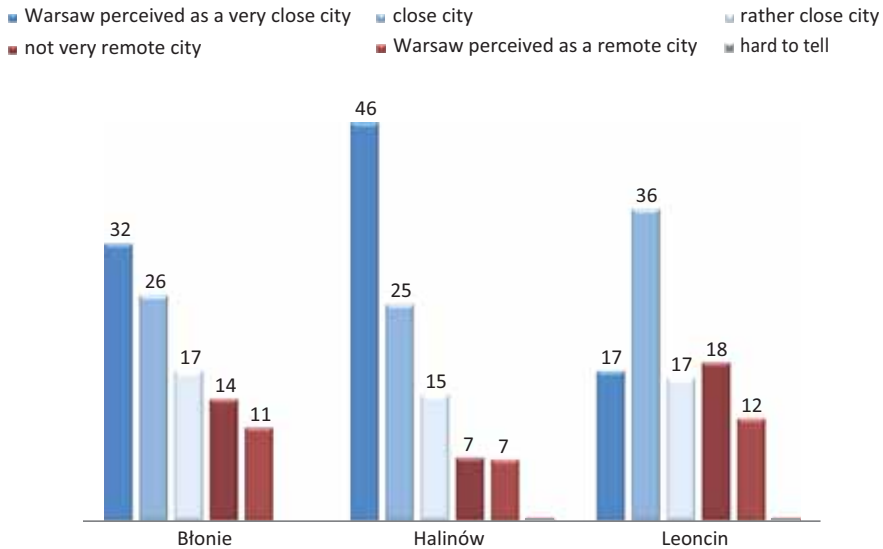


Figure 4.13. Perception of Warsaw as remote / close city (%)

The second question that was asked in order to learn more about how inhabitants of peri-urban municipalities find themselves in functionally integrated area, was the question about the impact of Warsaw on their every-day life (Fig. 4.14). In Błonie, Halinów and Leoncin respectively 42%, 30%, and 40% of respondents stated that the vicinity of Warsaw had no impact on their every-day life (answers “definitely no” or “rather no”). Although Warsaw is perceived as the close city, its presence turned out to be not important for pretty big groups of respondents. However, distribution of answers is interesting, and proves again the existence of strong relationships of Halinów with Warsaw (28% of respondents stated that Warsaw definitely has an impact on every-day life, compared to 17.5% in Błonie and 14.8% in Leoncin). Błonie functions as a nucleus – local center that fulfills the majority of needs of its inhabitants. Still, about 47% of respondents state “rather yes” and “definitely yes”, confirming the impact of the vicinity of Warsaw on their life. Leoncin, a typical rural municipality, is less equipped with services and does not offer jobs outside of agriculture. But only 14.8% of respondents stated “definitely yes”, declaring that the vicinity of Warsaw has an impact on their life. However, when we sum up these answers with “rather yes” answers, the percentage rises to 52%, and is similar to this from Halinów. Thus, the proximity of Warsaw is important, but for selected social groups and because of different reasons. Proximity of Warsaw is important mainly for people professionally active (almost exclusively outside agriculture), and especially for those who attend schools of different type. There is no competition for Warsaw when it comes to jobs’ opportunities and quality of educational services. Respondents, when asked how Warsaw influences their every-day life, beyond work and education, listed location in the city of cultural and entertainment institution that they make use of, also of specialized health care services that are not available in their municipalities. For young-

er respondents Warsaw is attractive as metropolitan, vibrant city where “you feel that you live”.

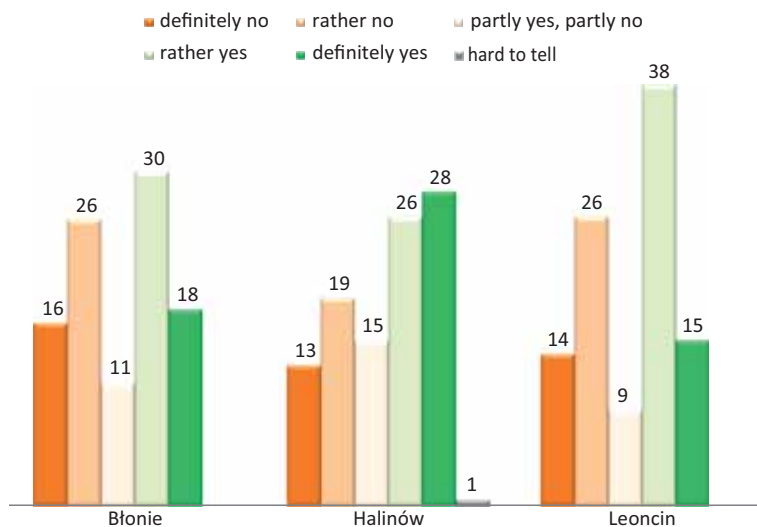


Figure 4.14. Vicinity of Warsaw: its impact on everyday life (%)

It can be concluded that regardless of the nature of the municipality and socio-economic structure of its inhabitants, Warsaw for them is the place where more specialized services are offered. It is also an attractive labour market; however – with differentiated attractiveness for inhabitants from the three municipalities. It is an important labour market for Halinów, where better educated and skilled labour force is located. It is less important for Błonie which offers jobs in the central town of the municipality, as well as in enterprises located in rural parts of the municipality. In the case of the typical rural municipality – Leoncin, the importance of Warsaw as a labour market is rather small. Most inhabitants work in agriculture, those from outside agricultural sector are generally workers with lower qualifications.

From what was presented above one may conclude that peri-urban municipalities are not only acceptable, but they are attractive places for living. So attractive, that the vast majority of respondents do not want to move to Warsaw (Fig. 4.15). There are no significant differences in answers provided by respondents from different municipalities. However, it shall be emphasized that against moving to Warsaw are first of all respondents from Halinów, then from Błonie and Leoncin. Reasons of these statements are different in different groups of respondents. Although again statistically significant correlation was not identified, cross-tabulations provided an information that respondents who ranked highly the attractiveness of landscape, and quality of environment in their municipalities, were definitely less eager to move to Warsaw. The length of residence in the municipality was also important. The longer the respondents live in the municipality, the

less eager they are to move. The only exception is Halinów. In case of this municipality, both those who resided in the municipality for a long time, and the newcomers did not want to move to Warsaw. Willingness to move to Warsaw was expressed more often by younger respondents, especially those who continued education. It concerned all three municipalities.

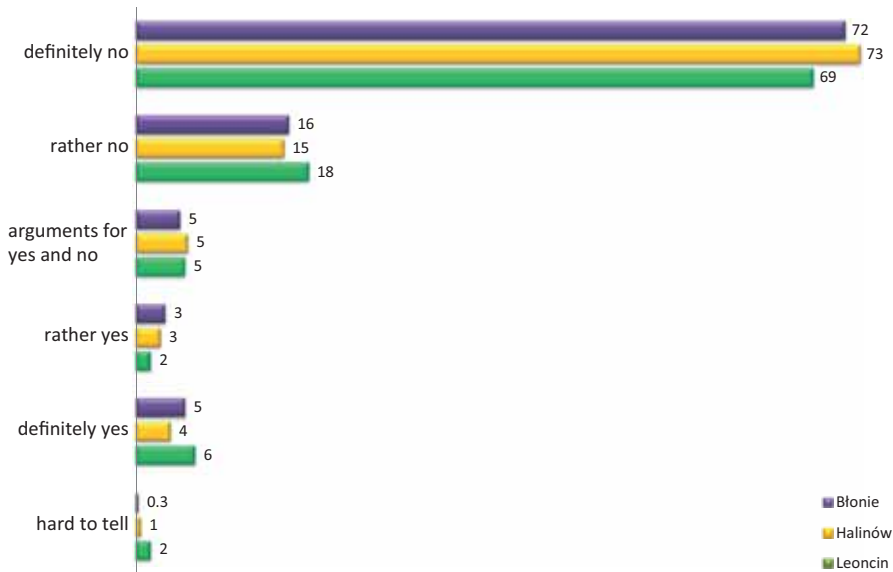


Figure 4.15. Desire to move to Warsaw (%)

What are the reasons that Warsaw is not seen by the respondents as an attractive place to live in? For respondents from Błonie three inconveniences of living in Warsaw are the most important: transportation problems (25%), noise, and the fact that the city is crowded (Fig. 4.16). In case of Halinów the respondents pointed out transportation problems at the first place (36%), then noise and, like in Błonie, the fact that the city is crowded. Respondents from Leoncin as the most important inconvenience pointed out noise (almost 29%), then “crowded place with too many people”, and afterwards intense development and transportation problems. In all municipalities the respondents paid attention to too fast pace of life. For respondents from Halinów and Leoncin Warsaw is a dirty city. Relatively high percentage of respondents from Halinów, compared to Błonie and Leoncin, pointed out higher costs of living. For all respondents the physical scale of the city (size, number of population) seems to be a problem. Clearly, respondents from Halinów have a lot of experience with commuting and know Warsaw’s transportation problems. The inconveniences listed can be regarded as disadvantages of living in Warsaw, as well as reasons why people move out from the city.

The distribution of answers can be explained only by the place of living of respondents; other social or economic characteristics are useless again. Respondents from Halinów have the most intensive contacts with Warsaw, since

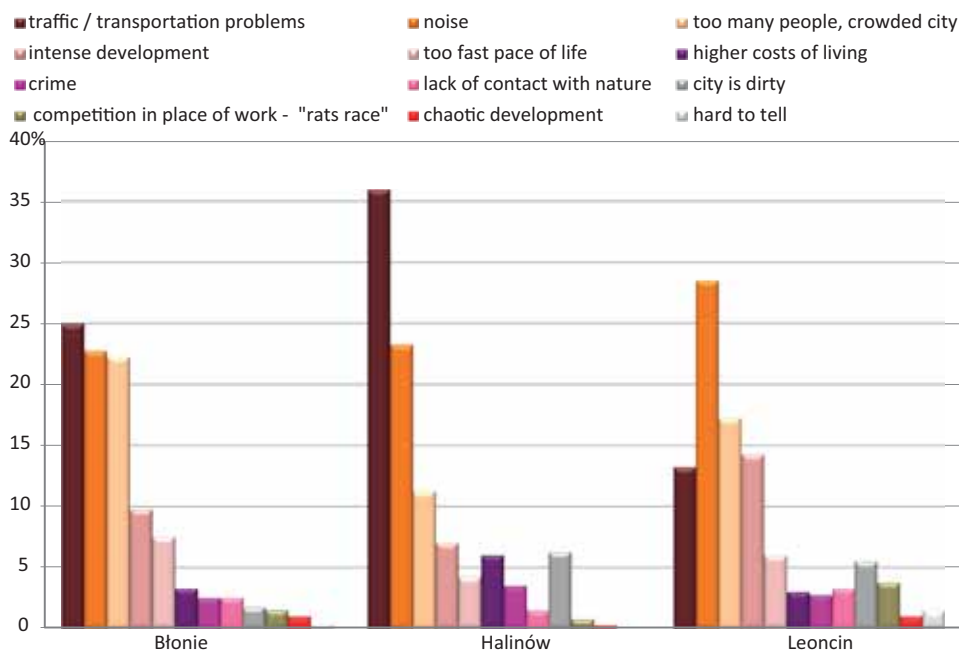


Figure 4.16. Inconveniences of living in Warsaw

a large number of them work in Warsaw. It seems that they know the city much better than respondents from other municipalities. They perceive life in Warsaw often through their personal experience. In other cases, especially in case of Leoncin, the image of Warsaw is built on experience gathered during sporadic visits to the city. Observations concern mainly these features of landscape and life that are different than in their home municipality.

It shall be noted here that very small number of respondents, from all municipalities paid attention to chaotic development of Warsaw in terms of its architecture and urban layout. The same respondents, when asked about “whether open spaces are as important to humans and provide a positive aesthetic experience as results of work of artists” agreed with this statement. Thus, they notice important aesthetic values of natural landscape. The question is, whether the cultural landscape (built environment) of Warsaw has no importance to them, or whether this landscape meets their aesthetic standards? The explanation might be that Warsaw is perceived from the perspective of its functions, and as a place of work or use of services, not from the perspective of the landscape and as a place of residence. In this case the importance of quality of cultural landscape comes as second *vis-à-vis* the importance of functionality and comfort of fulfilling expectations related to what the city has to offer to visitors. It is also interesting that Warsaw is not perceived as a “dangerous jungle” – in every municipality very small number of respondents paid attention to crime problem.

Warsaw has also, obviously, different advantages (Fig. 4.17). The most important advantage is easy access to cultural and entertainment facilities. This was

especially strongly emphasized in Halinów (44% of answers) and Błonie (42%); less in the case of Leoncin (27%). More possibilities to find a good job and better access to educational institutions are the advantages listed by respondents in all the municipalities. Advantages listed by respondents provide important information about distribution of functions in the metropolitan area of Warsaw: the most important ones are located in the central city, not in the metropolitan ring. Possibilities to find a good job, pointed out by respondents from Leoncin, also require additional comment: still the rural areas are not areas that are perceived as the ones that are able to create attractive places of work. From the perspective of peri-urban areas development and sustainable development of the entire rural-urban region this is a disturbing information. Experience from many countries with development of eco-services prove that, although one can not stop concentration of functions in central cities of metropolitan areas, there are still attractive options for development of rural and peri-urban areas. Agriculture does not have to be necessarily a synonym of something that is worse, or declining, and does not create opportunities for personal and professional development. It should be noted that, in the case of Leoncin such an attitude is rooted in the past, since this area is part of a rather poor agricultural region, one characterized by low-quality soils and the subsistence-type of farming. It is also interesting that two characteristics of big city: anonymity and access to well-developed technical infrastructure received rare appreciation.

Despite the noticed advantages of living in Warsaw, the inhabitants of peri-urban municipalities, as described above, do not plan to move to Warsaw. Warsaw

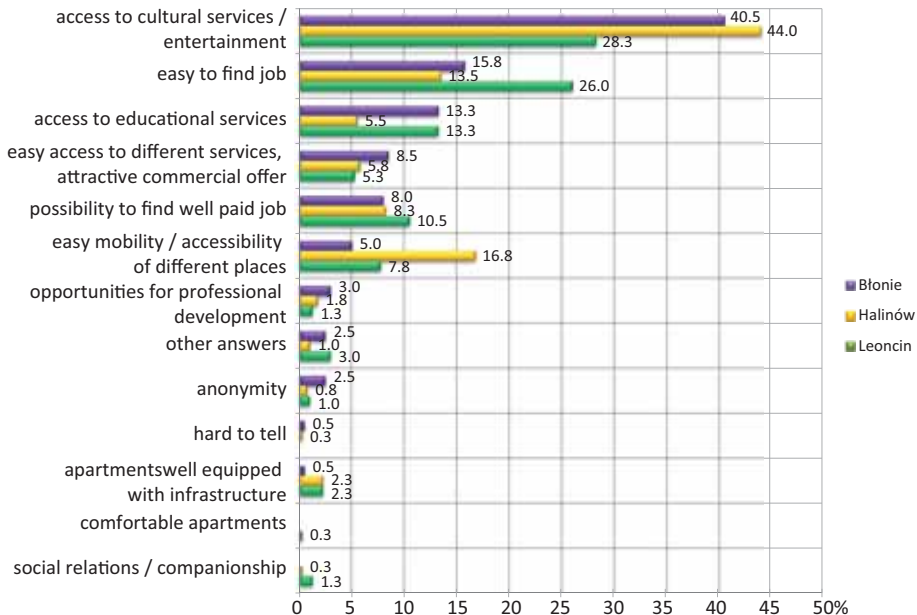


Figure 4.17. Benefits from living in Warsaw

is a “close” city for them, and nearness of Warsaw has impact on their every-day life. And to use what Warsaw offers does not require to move to the city. Especially so, as the city’s offer in terms of living conditions, is not significantly better one, and does not meet the most important expectations of respondents (Fig. 4.18). Respondents were asked a question: ‘if you have to chose today a new place of residence, what criteria would be the most important for you?’. For respondents from all municipalities quality of living environment, including natural environment (quiet place, not polluted, open, green spaces), was the most important criterion (respectively for 29.3% in Błonie, for 31.8% in Halinów and for 28.3% in Leoncin). In case of Leoncin the next two criteria were safety (24.3%) and possibility of finding good job (18.3%). In cases of Błonie and Halinów the distribution of answers was more even. However, for relatively big groups of respondents from Błonie the possibility of finding good job was an important factor (17.5%) followed by safety (16%). In case of Halinów the criterion: cost of buying / building / renting house or apartment was of significant importance (18.8%). It confirms the observation expressed earlier that Halinów is an exceptional municipality in this group of three, because it is a place of in-migration.

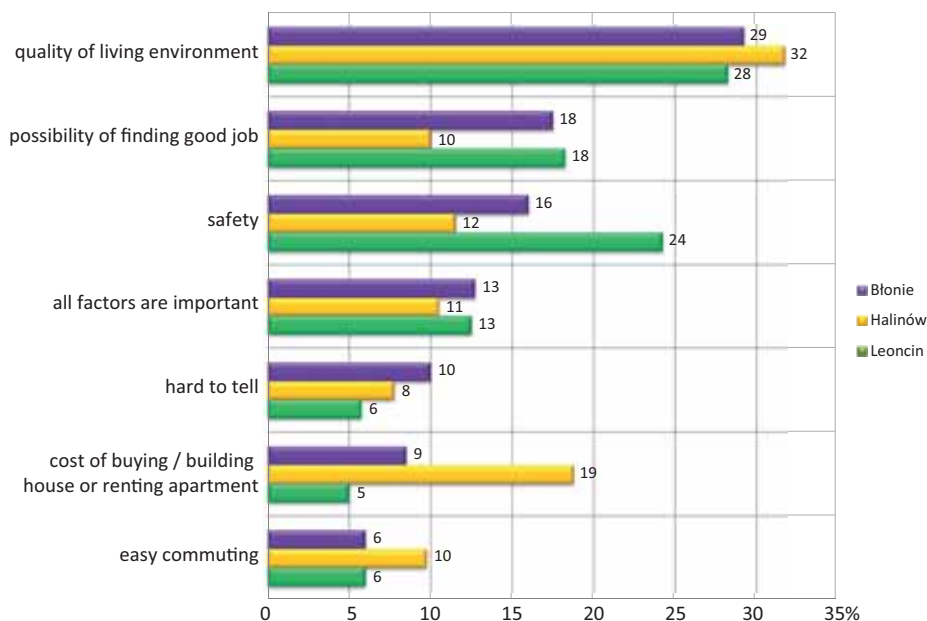


Figure 4.18. Most important reason of choosing place of residence

As stated earlier, all municipalities belong to the Warsaw Metropolitan Area, which was delineated for planning purposes by the Mazovian Office for Regional Planning. Discussion about development of metropolitan areas in Poland started some years ago, when negative consequences of suburbanization and urban sprawl threatened functionality of metropolitan areas, including the Warsaw Metropolitan Area. Still, there are no legal regulations on how to manage

the development of metropolitan areas. Different initiatives have not been translated into practical measures used for strategic, spatial planning and development management. Thus, what is observed in metropolitan areas is non-guided, spontaneous development processes that are generated by individual municipalities and private investors. Still, the development of individual municipalities depends to large extent on what is going on in other places and areas of the metropolis, because these municipalities are components of a metropolitan puzzle. Is this fact of being part of the puzzle noticeable for inhabitants of peri-urban municipalities?

In Błonie and Halinów more than 50% of respondents stated that their municipality belonged to the WMA (53% and 52%) (Fig. 4.19). But accordingly, 31% and 37% of respondents voiced the opposite opinion. In case of Leoncin the situation was reversed: half of the group of respondents did not recognize Leoncin as a part of the WMA, 37% voiced the opposite opinion. There is no statistically significant correlation between characteristics of respondents and answers given. It seems that, the more intense relations between the municipality and Warsaw, the more metropolitan municipality is in perception of respondents. It is interesting that the issue of metropolitan development was not unknown to respondents, although they were not familiar, which is understandable, with details of the debate on metropolitan issues.

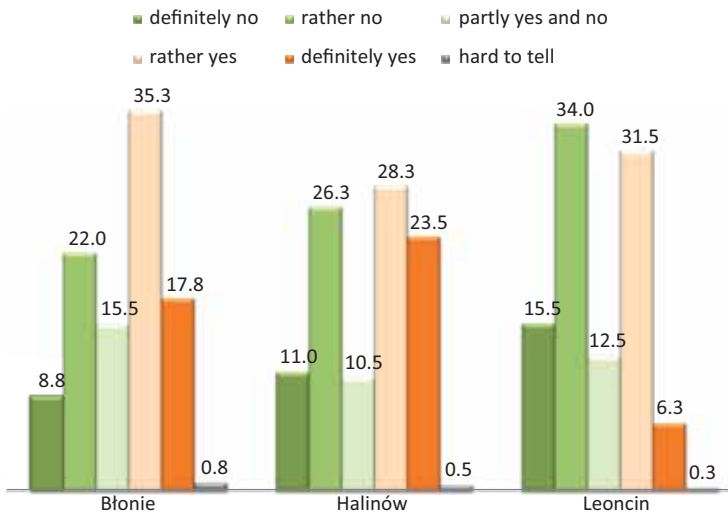


Figure 4.19. Location of the municipality in the metropolitan area of Warsaw: perception of respondents (%)

Answers from the respondents allow to draw a conclusion, that they perceive their living environment as something special, different from urban and suburban environment. Many of them see ongoing changes in their municipalities: increased number of population and changing land use pattern. The nature and scale of suburbanization and urban sprawl in the WMA prove, that peri-urban

areas may soon experience much more aggressive urbanization pressure, if the current trends continue. The next issue that we addressed in our studies was perception of reasons of changes in areas exposed to urbanization pressure.

Further urban expansion, according to respondents, depends on improving economic situation of the population, changes in life style and appreciation of value of natural environment. More than 30% of respondents in Błonie and Leoncin stated that improving economic situation of population would be the most important factor of future change. In Halinów the respondents believed that, what would bring urban pressure to countryside would be the natural environment attractiveness (26.3%) and changing life style (24.8%). The third listed reason in Halinów was lower prices of land and real estate. Respondents from Błonie and Halinów stated that, since Warsaw was the city that was not easy to reach via inefficient transportation system, municipalities, towns and cities around Warsaw, as more easily accessible, will develop faster (respectively 18% and 26% of answers). Generally, the opinion of the respondents was: the better transportation accessibility, the faster is the development of suburban and peri-urban areas. It shall be noticed that respondents from Halinów and Leoncin also pointed out global trends of urbanization processes (4.3% and 5.3% of respondents) as drivers of change. Thus, Warsaw and its metropolitan area would experience what is common for metropolitan cities in the developed countries (Fig. 4.20).

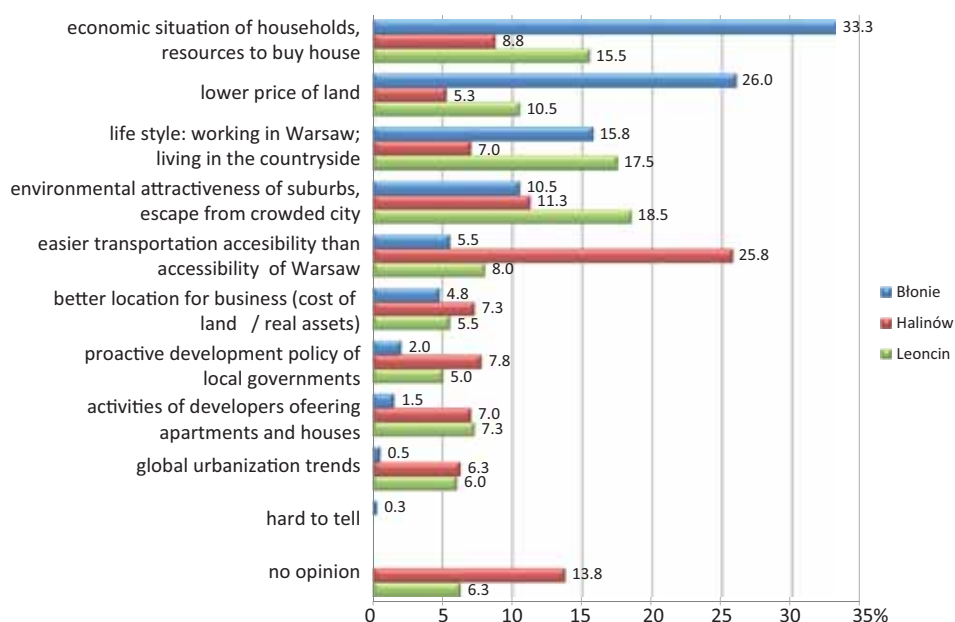


Figure 4.20. Drivers of change in suburban area

Comparing answers from different municipalities one may notice, that respondents from Halinów point out drivers of psychological and sociological nature, while respondents from Błonie and Leoncin emphasize importance of drivers

of economic nature. Life style comes as the third factor that will have an impact on changes in suburban and peri-urban areas. Economic situation of households, and resources in their possession to buy a house give more freedom while deciding about the place of residence. However, if we compare this statement with evaluation of suburban and peri-urban zones by respondents, presented earlier, the question arises: why should they move to suburban zone neighboring the city, which was evaluated by them rather critically? It seems that the suburbs still are a better alternative for the city. Areas located further from the city border become even more attractive. In a number of places in the WMA there are "new suburbs" constructed: small housing estates with low density development, sometimes built as gated communities, accessible only by car, with exclusively residential functions. They are a product of developers' activities and their location is often accidental in this sense, that it is not a consequence of long term development policies and spatial development plans. They are built in areas that are poorly equipped with technical infrastructure, with difficult access to central city, and lack of social services (Mantey, 2010).

Information received from interviews indicates, that for the younger respondents the costs of buying house or apartment are more important. Since the differences in costs are significant one may anticipate that the younger population will be more eager to locate outside the city. This leads to a conclusion that, in accordance with the land rent theory, cheaper land in the peri-urban areas will continue to attract newcomers. Different types of migrants from different socioeconomic groups will be pushed to specific locations by different factors, mainly residential preferences and financial possibilities. It might be foreseen that pressure on suburban zone will still exist, but at the same time the pressure on further located land will be even greater. The practice of suburban and peri-urban areas development in the WMA, with relatively low control over ongoing processes, may contribute to further spatial and functional chaos. Predominance of residential functions generates the necessity of commuting to work. If other needs can not be met in the new location, then an extra volume of trips to the central city, or other places where these needs can be fulfilled, would be generated. In all three municipalities the respondents who were asked about problems related to living in their municipality as the first choice pointed out: long commuting time, transportation problems especially during winter (local roads are not always cleared of snow), and bad quality of roads. Respondents from Błonie listed also heavy traffic and the related noise and hazards; those from Halinów and Leoncin added lack of system of water pipes (or inefficiency of the system) and power cuts. Yet, satisfaction from living in the municipality is still high. It sounds paradoxically, but information obtained proves that the distance, transportation problems or underdevelopment of technical infrastructure are not perceived as a burden, or barrier for settling even in remote areas. This is important ascertaining in the context of discussions about urban sprawl within the WMA. Availability of cheaper land for development, together with determination of people looking for preferred living conditions and their better financial situation will increase the urbanization pressure. Additionally, if inhabitants are ready to accept situation that they live

in a place that is not properly equipped with technical infrastructure, not served by public transportation, and accessible via poorly maintained and congested roads, local governments do not have to feel obliged, or may not see necessity of investments in order to attract new residents. The same may concern businesses, although in this case lack of technical infrastructure might be an obstacle.

There are four elements that have to be present in order to generate the move to a new place of residence: motivation of potential movers, opportunities created by living environment of specific locations, situation on real estate market, and possibilities to move determined by financial situation of individuals and households. All four elements are present in the case of the WMA. Preferences and expectations towards place of residence were described earlier in the chapter. The three municipalities are open for migrants, offering land for housing development. Land prices outside Warsaw are much lower than in the city; the further from Warsaw the lower they are, although there are some departures from this rule. Some areas are better linked by transportation network with Warsaw than other places, some have "better addresses" – these are prestigious municipalities or towns. But generally, the land and real estate outside Warsaw cost less. Even during economic crisis still there are wealthy social groups who can afford buying or renting houses and apartments outside Warsaw. Since all four elements listed above are present, peri-urban areas in the WMA might be in danger. It will be a natural reaction that someone determined to move out from the city will chose location that fits his expectations the most, even if this location is at a long distance from the city. The demand, that initially was directed into suburban zones, situated next to city borders, will be redirected to peri-urban areas. Inconveniences of commuting, or resulting from lack of services are balanced by benefits from residing in the environment that is preferred.

The paths of development of individual municipalities depend on many factors. One of them is development policies, designed and implemented by local governments. They play crucial role as a driver for development, since it is local governments' task to stimulate and guide development processes, according to vision of how the municipality should look like in the future, and in accord with specific development goals. Respondents' answers indicated that local governments were rather passive agents, and as such did not play a role of a driver of change. Only 2.0% of respondents in Błonie, 3.8% in Halinów and 2.0% in Leoncin stated, that development of suburban and peri-urban areas was driven by proactive local governments' development policies, that were aimed at creation of conditions for economic development and better living environment. This statement acquires additional meaning while confronted with opinions of respondents, on whether the development of suburban zone is chaotic, or well planned and guided. The picture obtained is disturbing: the development is seen as chaotic, and the role of local governments in the development processes as marginal. In Halinów 4.5% of respondents pointed out that developers are important driver of change in suburban and peri-urban areas, while only 3.8% of them regarded local government playing this role.

If this is the case, that local governments are only equally or even less important than developers and other drivers (that, in addition, are not under control)

it means, that current development trends, together with local governments' passive (reactive) policies, may lead to destruction of peri-urban areas assets. Lack of proactive policies may result in future development problems in not just a single municipality, but may create problems at the level of the WMA. Development of predominantly residential functions, lack of places of work, underdeveloped services, and poorly developed transportation infrastructure might make the metropolitan area dysfunctional.

As mentioned above, the price of real estate outside the central city is much lower. This is important fact for some respondents, especially the younger ones. It is also important for business looking for good location in the vicinity of Warsaw. An attempt was made in the present study to check whether the land price was seen as a factor of change in the three municipalities. It turned out that residents did not have a good orientation in this matter. 36.5% of respondents in Błonie, 43.3% in Halinów and 26.3% in Leoncin admitted the lack of information about the land prices. Those from Błonie and Halinów were convinced that the land price did not differ significantly from that in neighboring municipalities (approximately 27%). In Leoncin the respondents stated that the price of land in their municipality is lower than in others (definitely lower 11.8% and rather lower 38.8% of answers). The respondents were not involved in transactions on the land market. Most of them, regardless of municipality, had no plans to purchase land (approximately 93%). Plans to sell land had mostly owners of land from Leoncin (15%), then from Halinów (11%) and Błonie (8%). Among those who declared plans of selling the land were almost exclusively farmers (Fig. 4.21).

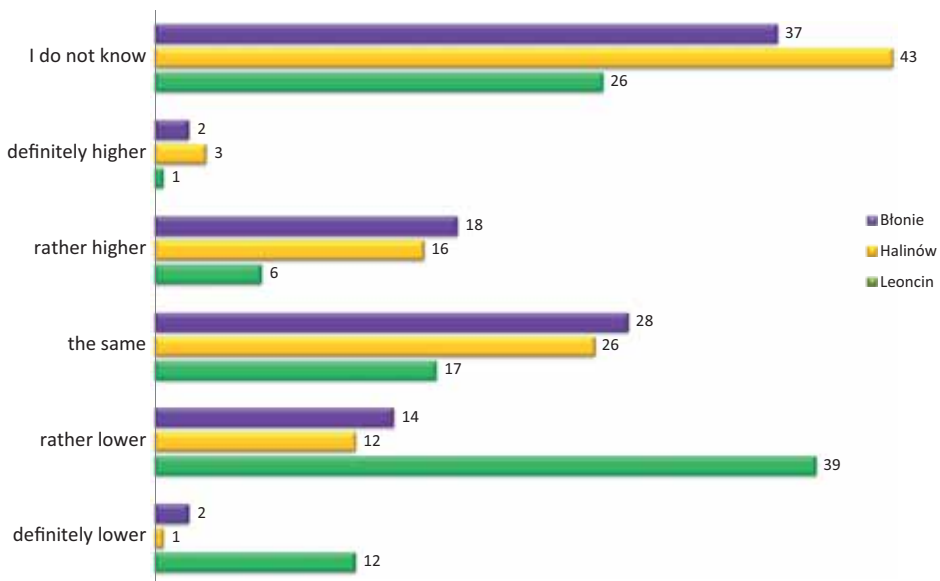


Figure 4.21. Land price in comparison with neighbouring municipalities (%)

As already mentioned, residents did not see local governments as proactive actors, which had an impact on the future development of their municipalities. However, the respondents have their opinions, visions, preferences, and expectations towards future development. Their needs and active participation in planning process might be important factors that have influence on the paths of municipalities' development. What do inhabitants expect from local governments, in terms of activities and undertakings, that will make life in peri-urban areas better? Are there any specific expectations concerning local government policies related to urbanization pressure? First, the respondents were asked to voice their opinion on the following statement: "suburbanization and urban sprawl are typical and normal processes accompanying development of big cities, and local governments, in municipalities that experience these processes shall first of all take care of services for inhabitants, and secure good transportation for people who work in Warsaw and other cities of the metropolitan area". They were asked to mark their opinion on the scale from "strongly disagree" to "strongly agree". The scale had five options to mark, with neutral position in the middle (acceptance with some reservations). Most of the respondents from all municipalities agreed with this statement. In case of Błonie 83.8% declared "agree" and "strongly agree", in Leoncin 82.5% and in Halinów 74.3% voiced the same opinions. In Halinów the number of respondents, who pointed out neutral answer (which means partial acceptance) was the biggest (23.3%) (Fig. 4.22). The answers show, that processes related to urbanization pressure are perceived as something inevitable. Expectations towards local governments are, that local governments will take care of inhabitants who have settled in their municipalities. Very small number of respondents did not agree with this statement ("strongly disagree" and "disagree"). Taking into account what respondents said earlier, about main reasons of urban expansion and the role of local governments in guiding suburban development, one may state that the respondents in fact do not expect proactive

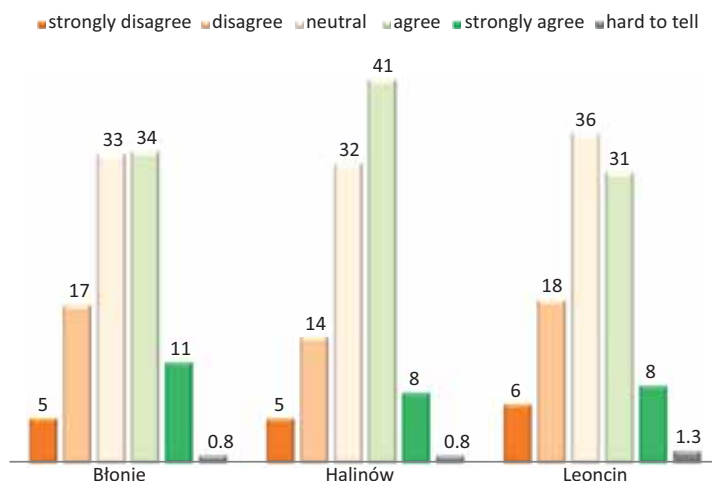


Figure 4.22. Suburbanization and policy response (%)

policies of local governments. They expect reaction to consequences of what they perceive as inevitable: spontaneous development of suburban zone and peri-urban areas. There is very little understanding among respondents of mechanisms of suburban and peri-urban development. Distribution of answers prove that a rather naïve approach to urbanization pressure dominates. Usually it is not possible to fix problems by reacting just to results of dynamic phenomena and processes, the impact of which is gradually increasing. Proactive approach and efficient measures to guide development are needed in order to prevent negative consequences from happening. Acceptance for this statement means also acceptance for spatial chaos, and lack of functionality of the system. "Typical and normal" processes do not have to be out of control. In fact, local governments possess powers to plan on how to use local resources, and to choose development options. "Typical and normal" processes are usually well known in terms of their consequences, and it is not difficult to predict what they bring to municipalities.

The respondents also believed that local governments should not limit the scale of suburban and peri-urban development. Percentages of respondents against such limitations in Błonie were 53.8%, Halinów 48.1%, and in Leoncin 53.1% (Fig. 4.23). There are no significant differences among answers from different municipalities. There is a consent to further development, as well as to rising numbers of migrants in areas under urbanization pressure. In this case the percentage of those against in-migration restrictions is even bigger (Fig. 4.24). More urban functions and more migrants are perceived as factors that may give incentives to municipalities economic development. Increased tax base and new jobs are attractive gains both from the perspective of inhabitants and local governments. That's why respondents do not expect restrictive policies from local

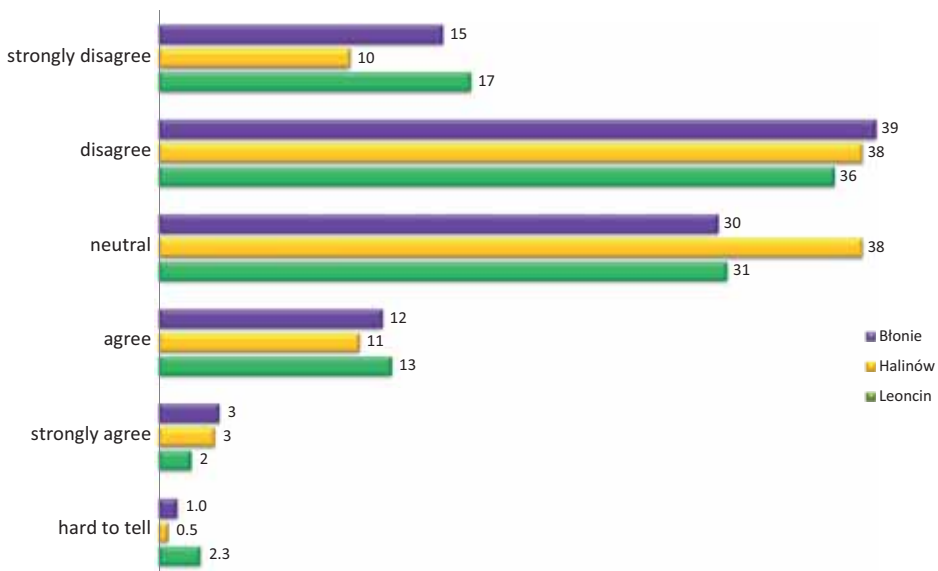


Figure 4.23. Local governments shall limit scale of peri-urban development (%)

governments. They see more opportunities than threats that might be brought to their municipalities due to the rising scale of suburban development.

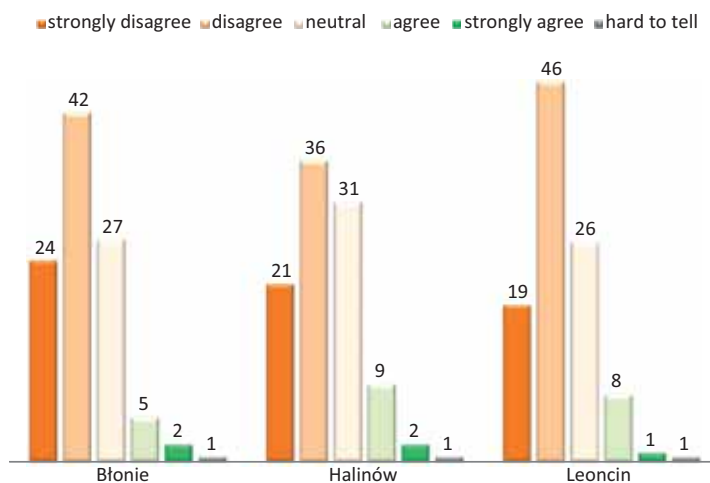


Figure 4.24. Local governments should limit immigration flows to peri-urban zone (%)

About 65% of respondents from Błonie and Leoncin were against limitation of immigration flow. Slightly smaller percentages were noted in Halinów (57.3%). It seems that development is perceived as a process that depends to large extent on external resources. Migrants are welcome as a new asset. From answers obtained one may draw a conclusion that, although respondents see negative aspects of development that is not guided, they still tolerate situation when their municipality might be subject to invasion by people and businesses. This is a paradox that can be explained in two ways. Firstly, it might be that there is an acceptance for phenomena and processes that may stimulate local economy. The second explanation would be that majority of respondents are tolerant, because they believe that having a freedom of choice is the right everyone has. They may find themselves in similar situation like potential migrants coming to their municipalities.

Owners of land and developers are powerful players in the game of different parties, which try to secure their current and future interests. They may have crucial impact on the land use pattern. Their position among other interested parties is unique in this sense, that after reaching their goals they may disappear from the municipality and they will not bear any consequences of their decisions. We have learned earlier from the respondents, that they approved reactive policies of local governments. The next question asked was how tolerant they were towards private investors. To test it the respondents were asked to voice their opinion about the following statement: "owners of land shall have right to build on their land what they want and local governments have to respect their interests" (Fig. 4.25). A smaller acceptance for this statement was in Leoncin (10.3% strongly agree and 20.3% agree). But in Błonie and Halinów respectively 21% and

19.3% of respondents strongly agreed with this statement. It is also worth noticing, that many respondents in Leoncin (36.8%) and Halinów (34.8%) voiced neutral opinions. It seems that unlimited freedom of investors is seen as potentially dangerous. When we recall what respondents stated about local governments reactions to the scale of suburban and peri-urban development and the immigration issue, it seems that the NIMBY syndrome played here an important role. While suburban development and in-migration flow might be perceived as something abstract from the perspective of individual person, a concrete investment is not abstract any more. It might be located on the neighboring empty plot. Thus, answers obtained reflect an ambiguous approach to ownership right and freedom of investors, which may not respect interests of municipalities' inhabitants, or others present there. Owners of land and developers may play a role of drivers of change; however, a significant number of respondents voiced the necessity of some control on what they plan and what they do.

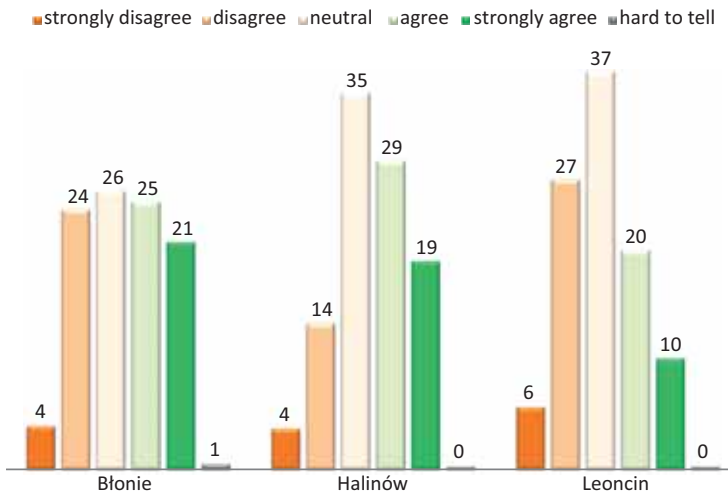


Figure 4.25. Land owners should have right to build what they want and local government have to respect their interests (%)

From what was said about drivers one may conclude that the future of suburban zone and peri-urban areas is uncertain. Local governments do not play a role of leading agents of change. The nature of development processes and their results are determined by actions undertaken by different agents. They are rather not coordinated and not subordinated to well thought through, long term development plans. In this context a question on development scenarios of these areas arises. What is going to happen to different parts of suburban zone and peri-urban areas in terms of forms of development, social structure of inhabitants, functions they play in the metropolitan area? Another question is how ongoing changes impact on functionality of metropolitan area? Will they contribute to the increase of its attractiveness for settlement and investment, or quite opposite? The example of Halinów proves, that some municipalities

develop consistently, following one development path. In this case it is the development of Halinów as a residential municipality, with strong links with Warsaw. In case of Leoncin development options are open, or maybe better to say that they are vague. Current living conditions and relations with Warsaw show, that this municipality might be losing its rural character. However, it is difficult to point out what will replace the agricultural functions. Błonie will follow its current path of development as a peri-urban nucleus, with investments that create relatively solid base for economic development. However, the question is, what will happen with rural areas situated in this municipality? The ongoing changes may lead to further urban development that will transform Błonie into predominantly urban center – a larger urban nucleus, which may constitute a component of polycentric system of towns and middle size cities within the WMA, once such a system develops.

4.4. Expectations towards future development policies

Drivers of urbanization pressure contribute to transformation of peri-urban areas in different dimensions. The most important is functional dimension related directly to changing land use pattern. Functional dimension of transformation brings also social and demographic changes in the municipalities. Introduction of new, or development of old functions (especially residential ones) shall result from deliberate policies implemented by local governments. These policies ought to be formulated on the basis of objective evaluation of development potentials, evaluation of social and economic situation, and on expectations expressed by inhabitants. The next issue addressed in our studies was expectations of inhabitants of peri-urban municipalities towards future development policies.

Results of the interviews proved that economic development was perceived as the priority of development policies in all three municipalities. What the respondents expected from local governments were policies that would lead to improvement of local economy conditions and creation of new work places. Economic development is expected to bring changes in other spheres of public life, and to be translated into improvement of living conditions. That is also why the respondents did not want local governments to limit suburbanization, or reduce migration flows. Economic development as priority was pointed out by 73% of the respondents in Błonie, 65% in Leoncin and 58.8% in Halinów (Fig. 4.26). In Błonie and Leoncin respectively 10.3% and 13% pointed out the development of housing. Development of housing might trigger in-migration of population from other locations and increase the local tax base. Thus, there is a logic in answers given about limitations of growth. Environmental goals of development policies are emphasized in Halinów (31%). These goals are less important in Leoncin (18.3%) and Błonie (15.3%). In case of Leoncin natural environment

assets are under legal protection. Respondents from Halinów clearly expressed their desire for development that respect natural environment conditions. As it was mentioned earlier several times, residential character of the municipality, together with social structure of Halinów's community, determined the answers obtained from respondents. Although they saw the necessity of economic development, still the environmental issues were important. It is characteristic, that in all three case study areas only small numbers of respondents wanted to preserve the current state of their municipalities.

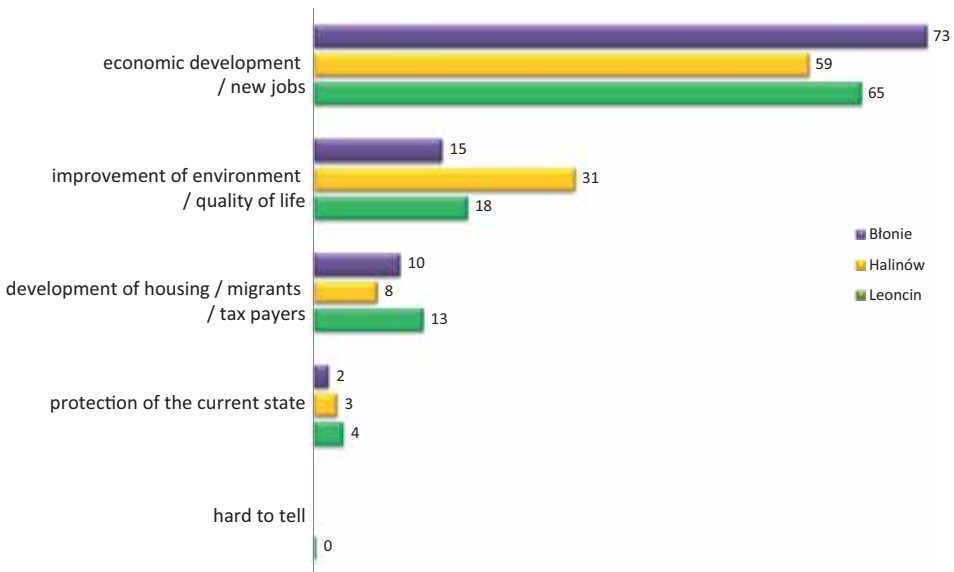


Figure 4.26. Main goals of development policies (%)

Every direction of future development will be related directly or indirectly to land use pattern. That is why the respondents were asked a question about what should be done with land available for development, that is in possession of municipalities. This question allowed to confront declared preferences concerning main goals of development with ideas on how to use available resources (Fig. 4.27). Results of this confrontation show some discrepancies between respondents' expectations concerning future development, and their preferences concerning the use of available land. In all three municipalities about 40% of respondents pointed out as the first choice conversion of available land into recreational areas. In Błonie about 45% of respondents would prefer to use available land for housing development (multifamily buildings and single family houses). This specific choice is a logical consequence of answers on development priorities. It is worth to draw attention to relatively small number of respondents in all municipalities, who stated, that available land shall be used for R&D centers, or new firms. Only in Błonie 8.3% stated that available land should be used for location of new firms. Błonie is the municipality that calls itself the Capital City

of Polish Logistics. There are several logistic centers locate there. And it seems, that for respondents this is enough. Only 0.5% of them would use available land for this function. The same is true with location of warehouses, or big shopping centers. All of these investments are space consuming. In case of logistic centers the size of investment is not translated into the number of employees from the local area. From the local governments' perspective CIT that goes to municipalities budgets is an important argument to have such investors and investments in their municipalities. Inhabitants' perspective might be different: large scale investments invade space, consume available land, increase traffic, noise and air pollution, and introduce alien elements into traditional landscape of the countryside. Thus, acceptance for them is very limited.

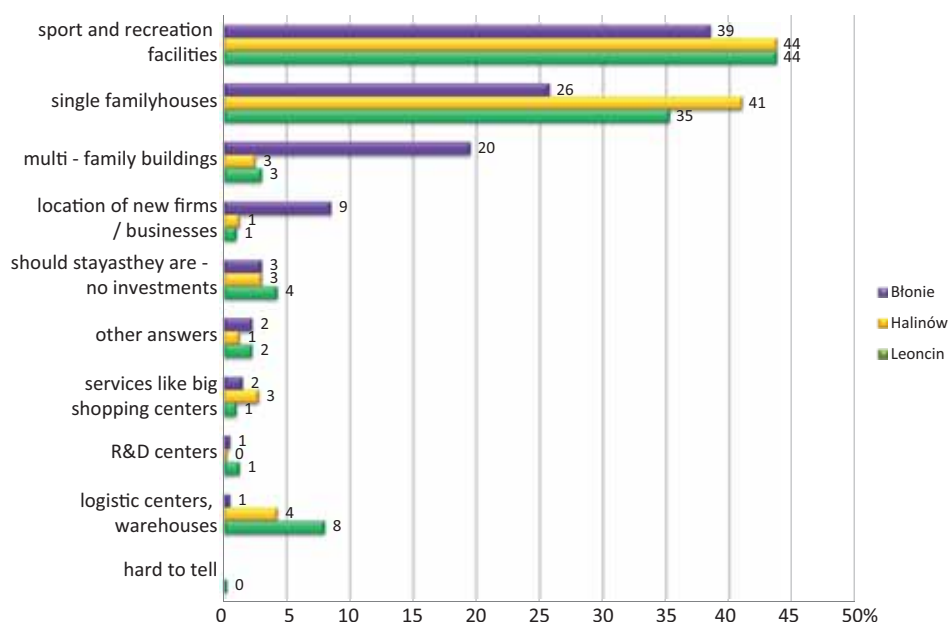


Figure 4.27. Preferred use of plots available for development

In the context of selected, main goals of development and preferred use of available land, an interesting question about modes of economic development arises. On the one hand it seems that there is a conflict between needs expressed (economic development) and preferences (land for recreation) presented by respondents. On the other hand, this conflict is not inevitable, and may occur mostly in a situation, when economic development plans require new, large plots that have to be developed to accommodate new firms. If new investments are contained in already developed parts of municipalities, the conflict disappears. Opinions formulated by respondents are an important message for local governments. Economic development is needed, but the way the municipality will be developed should secure needs of inhabitants for access to facilities that require space, like recreational ones. Thus, the challenge for municipalities will be to find modes

of development that will reduce invasion on available land. Extensive development should be replaced by intensive one. It means, among others, restructuring of local economy and modified use of developed areas. It might be a challenge for local governments to come up with ideas on how to reach these goals. Extensive development is tempting, as much easier to plan and implement. Creativity and many efforts are needed to enter the path of intensive development. Location of municipalities within the WMA, in the vicinity of Warsaw, and their peri-urban features may provide incentives for intensive development. Access to Warsaw's huge market for goods, services and labor force opens different possibilities. However, deconcentration of production or service functions progresses rather slowly. What can be noticed in the WMA is a shift in location of construction firms. They move from Warsaw, and its nearest surroundings to locations 30–50 kilometers distant from Warsaw.

Beside the land currently available for development, there are other open space areas, that are inherent parts of rural-urban regions: these are agricultural areas and those of high natural environment values. Agricultural areas might be, under specific conditions, converted into land offered for development. Areas of high natural environmental values are usually legally protected. However, these parts that are not protected might sometimes also be used for development purposes. In every case of conversion, or transformation of land specific procedures must be followed. They are supposed to guarantee that land conversion, or transformation will not be in conflict with general rules governing spatial development policy of the municipality. It is also important, that planned conversion or transformation will not be against basic principles of sustainable development. Depending on the type of land, and the scale of planned changes different institutions are involved in decision making processes. In many cases this is solely local government responsibility to grant permission for development. In problematic cases institutions from regional level are involved. In cases, when conversion or transformation of valuable agricultural land, or areas with high environmental values are considered, Ministry of Agriculture and Rural Areas Development is involved. As mentioned earlier in the chapter, respondents from all municipalities valued environmental conditions of their municipalities. When asked about land available for development they voiced for its use for recreational purposes. Additional questions about other open space areas and agricultural land were asked in order to verify the respondents' attitude towards these assets, in the context of declared preferences concerning main goals of their municipalities' development.

Most respondents, from all three municipalities declared that the area of open spaces should remain in the current state. In Błonie 41.8%, Halinów 51%, and in Leoncin 63% of respondents voiced this opinion (Fig. 4.28). Relatively small numbers of respondents agreed that this area shall be reduced. Distribution of answers reflects specific situation of the three municipalities. In Błonie 40.1% of respondents agreed that open spaces should be enlarged (24.3% agree that these areas should rather be enlarged, 15.8% that definitely should be enlarged). The percentage of those who wanted these areas to be reduced is the smallest one among all three municipalities (11.8%). In Halinów this group was much bigger (22.5%). The lack of open space areas was experienced mainly by inhabitants

of Błonie. Two other municipalities were well equipped with them. As a result, respondents from Halinów and Leoncin postulated their reduction, since the consequences for living conditions would be minimal. Additionally, reduction of the size of these areas means their potential development for preferred purposes. It might be anticipated, that in Halinów the other purposes would be related predominantly with functions that impact on quality of life. In Leoncin it would probably be housing functions.

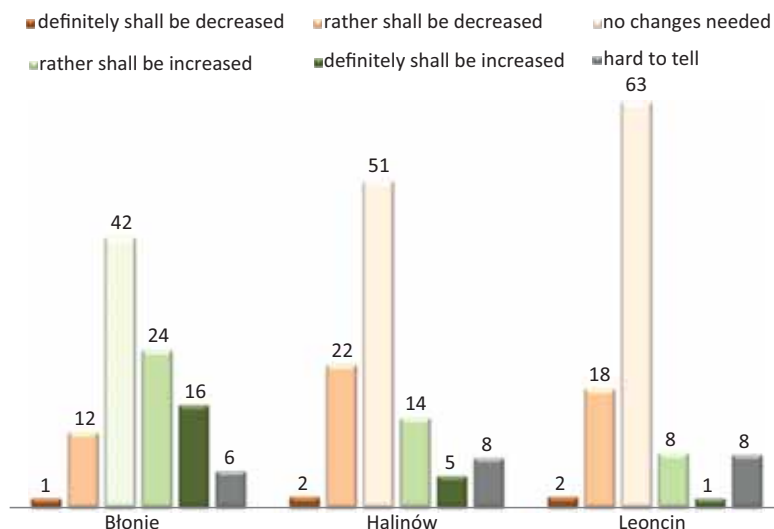


Figure 4.28. Opinions concerning open space (%)

Opinions about agricultural land are slightly different. 56.3% in Błonie and 39.5% in Leoncin advocated for no changes of the area of agricultural land, while in Halinów it was 27.8% of all respondents. At the same time, the majority of respondents in Halinów would reduce the area of agricultural land (55.3%) (Fig. 4.29). Halinów, in the context of answers received, presents itself as a municipality that is on the path of urban development. In Błonie and Leoncin agriculture is still an important sector of local economy. Although it is not as profitable as other sectors, traditionally many inhabitants find employment there. Leoncin is a typical rural municipality; still relatively high percentage of its respondents (42.8%) stated, that the area of agricultural land should be reduced. This is a natural reaction to development processes observed in many parts of the WMA. Agricultural land is shrinking, residential areas are expanding. Transformation of rural areas goes basically in one direction: conversion into land for non-agricultural functions. New functions are perceived as future oriented, and supporting economic development of municipalities. There are very few examples of transformation of traditional agriculture into organic food production farms or studs. Agro-tourism finds little attention, although in Leoncin younger farmers start to offer this kind of services. Generally, agricultural land and agricultural production itself do not seem to be treated as exceptional assets.

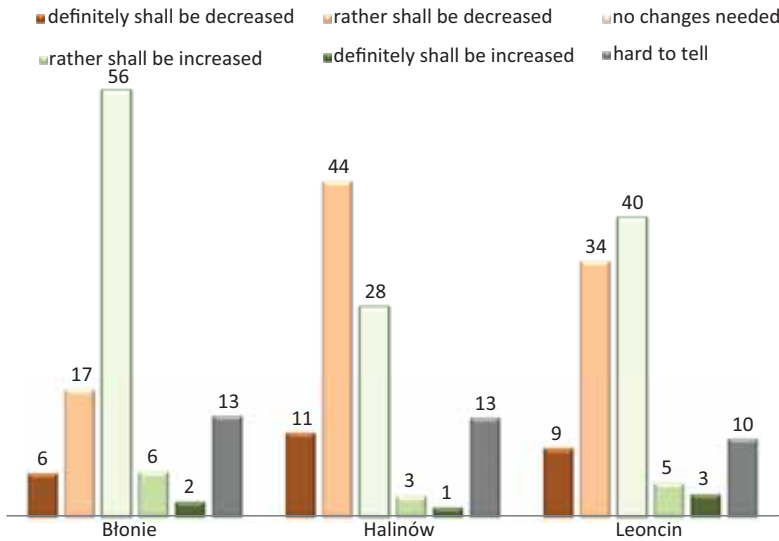


Figure 4.29. Opinions concerning agricultural land (%)

Answers to questions about reduction of open space and agricultural areas ought to be interpreted together with answers to questions about expected main goals of development and the use of plots available for development. All questions are related to sensitive issue of protection of natural environment and living conditions. Peri-urban areas attractiveness depends mainly on their natural environment assets. Additionally, peri-urban areas constitute a key component of rural-urban region, just because of the natural environment conditions and functions located there. From the perspective of inhabitants both environment conditions and functions are important elements of living conditions. Part of living conditions is access to jobs and services. Answers received from respondents from Halinów proved, that the approach to development priorities and open space, as well as agricultural land depended on two characteristics of respondents: age and the length of living in the municipality. Young respondents, who moved to the municipality during last several years, supported the idea of reduction of open space and agricultural land. Residents of Halinów, who have spent most of their life in the municipality, are not eager to support this statement. In Błonie answers depend on whether respondents come from the city of Błonie, or rural parts of the municipality. Respondents from the countryside were usually against reduction, or they stated that no changes were needed.

Looking for development options for the three municipalities one ought to remember, what respondents stated about the closeness of Warsaw. The vicinity of Warsaw, and perception of Warsaw as a “close” city brings the question about relations between Warsaw and the municipalities in terms of location of different functions – in the central city of the metropolitan area and its surroundings. This question is related directly to the development paths, that can be adopted by municipalities. Respondents were asked to voice their opinion regarding the

following statement: “economic functions (production, services) shall be located predominantly in Warsaw; the suburban zone and peri-urban areas shall mainly play a role of areas offering leisure and recreational opportunities for inhabitants of Warsaw”. The distribution of answers is interesting. The number of respondents who disagree with this statement was relatively small (about or less than 15% in all municipalities). Majority of respondents (in Błonie 50.5%, in Halinów 44.5% and in Leoncin 48%) voiced their neutral position, which can be interpreted as acceptance with some reservations (Fig. 4.30). This option seems to be attractive,

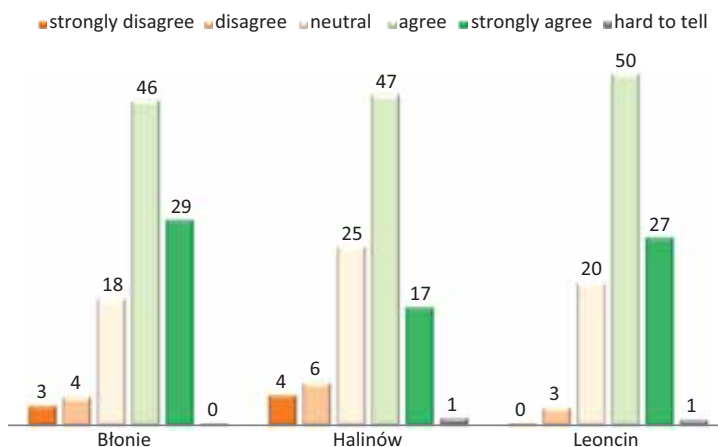


Figure 4.30. Location of production and services in Warsaw; peri-urban zone offering recreational functions for Warsaw’s inhabitants (%)

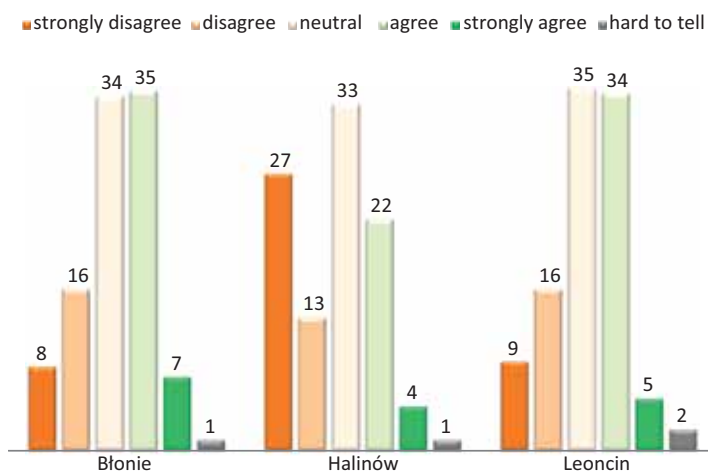


Figure 4.31. Opinions concerning location of shopping centers, logistic centers, warehouses in peri-urban areas (%)

because it strengthens links with Warsaw, and offers new possibilities for development based on endogenous assets. It may also give incentives for development of technical infrastructure, namely transportation infrastructure, assuming that the option is adopted in development plans. The largest group of those who agreed with this statement comes from Halinów (43.3%). This option perfectly fits the ideas for Halinów development, presented earlier by its inhabitants. Respondents from Halinów did not see their municipality as a place where big shopping centers, logistic centers or warehouses should be located. This is much more acceptable for respondents from Błonie (41.5%), where such facilities are already located, and in Leoncin (39.3%), where investments of this type may create new jobs outside agriculture (Fig. 4.31). Characteristic features of municipalities, together with their current development paths and their economic development level, explain answers given by the respondents.

4.5. Rural-urban region: development problems and challenges

Rural-urban regions are, by definition, differentiated in terms of forms and intensity of development, land use pattern, functions performed in different parts of the region, and conditions of life. Individual municipalities in a rural-urban region conduct their own, autonomous development policies. They perform their own tasks, and tasks delegated from upper levels of administrative tiers, and these are local governments that are responsible for securing basic needs of inhabitants (including health care and educational services), and for stimulating and guiding development processes. The Warsaw Metropolitan Area, although delineated and used for different analyses, is still an abstract creature in this sense, that there is no legal body responsible for its development. According to the current legal regulations it might be said, that this is regional self government responsibility, since the WMA is a part of the Mazowieckie voivodship. However, the legal framework of spatial planning, and the law on local government, do not offer any provision that might be employed to prepare planning documents for the metropolitan area, that would have binding power, i.e. will oblige municipalities to undertake specific activities or coordinate their plans, that would serve not only their purposes, but also purposes of neighboring municipalities. Regional self government, even if interested and motivated, has no legal base to influence the development of metropolitan area. Some impact may derive, of course, from different investments at the regional scale, especially in technical infrastructure, but it has very little to do with deliberate, comprehensive development policies. In earlier parts of the chapter, where drivers of peri-urban areas development and expectations of inhabitants concerning future development were described, some development problems were signalled. In this part issues

related to performance of local governments, spatial planning and development management will be presented.

One of the questions posed to the respondents was formulated in the following way: “do you think that local government takes good care of interests of your municipality?” The biggest groups of respondents had neutral opinions (Błonie 36.3%, Halinów 35.5%, Leoncin 22.5%) (Fig. 4.32), that reflect acceptance with some reservations. The largest group of respondents satisfied with their local government was from Błonie (30% rather yes, 3.5% definitely yes). This is the best evaluation of local government among the three municipalities. The most critical opinions were voiced by respondents from Leoncin: definitely no 29.3% and rather no 29.8%. As it was mentioned earlier several times, Leoncin is a rural municipality, with the weakest base for economic development, and with relatively low level of living conditions. Agricultural character of the municipality, and the fact that pretty big part of its area is excluded from investments (restrictions connected with protection of natural environment resources), have a negative impact on its economic performance. Inhabitants may feel discriminated against and unlucky, because they do not see any spectacular changes in their municipality, while other municipalities experience such changes. Inhabitants from Halinów are also critical. 17.3% of respondents stated that local government definitely did not take good care of their municipality’s development. Their expectations are much higher than results of local government activities.

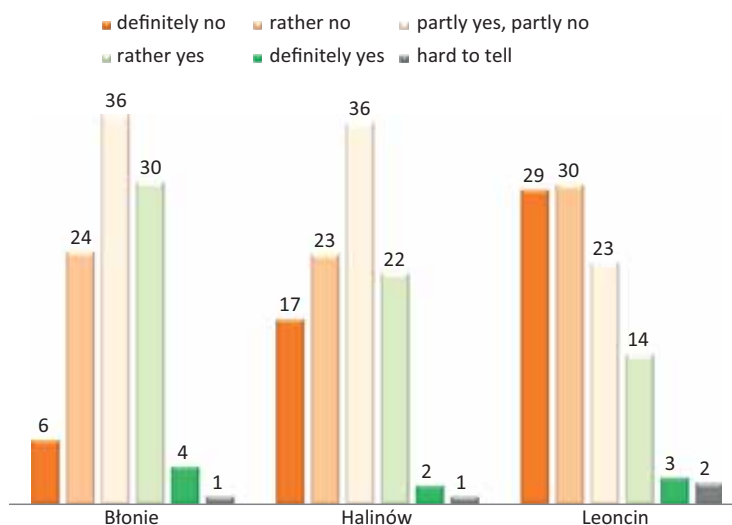


Figure 4.32. Opinions concerning local government performance (%)

If inhabitants are not happy with the way local governments take care of interests of their municipalities, do they try to influence somehow local governments activities? Do they formulate their demands and postulates and advocate them? Results of the studies provide the information that social participation in policy making is dramatically low. The questions respondents were asked concerned

their participation in the process of spatial planning. The law on spatial planning requires from local governments consultations with local communities on spatial policy directions, and on specific land use plans. Local government is obliged by law to present to the public assumptions of spatial development policy, collect comments and motions, consider them and inform whether they would be respected or not. Eventually, local government is obliged to present the final version of the spatial development policy, which is passed by the municipality council. The same concerns land use plans. The way local government obligations are fulfilled depends to a large extent on local government's approach to consultations. They can take different forms: single event just to present proposals and collect reactions, series of meetings with local communities on different aspects of documents under preparation, special workshops to work together with citizens on possible options, creation of task forces with representatives of local government and local community, etc. Formal obligations are relatively easy to be fulfilled. The question is how to organize consultations to make them useful and efficient. One, but very important condition is, that citizens are eager to participate, and it was the issue we focused on in our studies. We did not study the way local governments organized consultations, although it might have an impact on citizens' involvement. We assumed that even if the environment for and rules of consultations was not friendly and encouraging, still motivated and determined citizens could find the way to be part of the process.

In the last five years 20–30% of the respondents were asking after land use plans (Fig. 4.33). The most interested respondents were those in Halinów (29.8%). 12% of them asked once, 17.8% asked after these plans several times. The most passive respondents lived in Leoncin: 5.8% asked once, 12% asked several times. Asking after plans could take different forms, e.g. enquiry via internet, visit to municipality's office to get information. Personal participation in meetings organized by local governments, specifically to discuss land use plans, was even lower than the interest in the plans. In Błonie and Halinów the number of participating in these meetings respondents was similar: 16% and 17.5%; in Leoncin it was 11.3% (Fig. 4.34). It must be emphasized that the number of those who participated in the meetings more than once was at the level of 10% or less.

In the group of the three municipalities Halinów is the one with the most active respondents. There are several factors that are responsible for this situation. The most important is probably the very visible presence of migrants, who are interested in preserving all these assets that brought them to Halinów. It might be also that the migrants are better prepared to take care about their interests through involvement in planning procedures owing to their level of education, and knowledge on planning procedures.

Although the respondents were not satisfied with the way municipalities were governed, the majority of them were not involved in consultations on spatial development policy and land use plans. One may anticipate that this was because they did not care, or that they left decisions to local governments, as competent bodies, prepared to perform their functions. However, as stated earlier, respondents did not perceive local governments as the leading actors, having impact on development processes. Thus, it was rather the lack of interest in local devel-

opment issues than trust in local governments competences and skills. If we put together these facts, a question about the future of peri-urban areas comes back again. Who is going to have, figuratively, ownership rights over areas that need to be governed with long term vision, which will protect their resources and, at the same time, secure development opportunities?

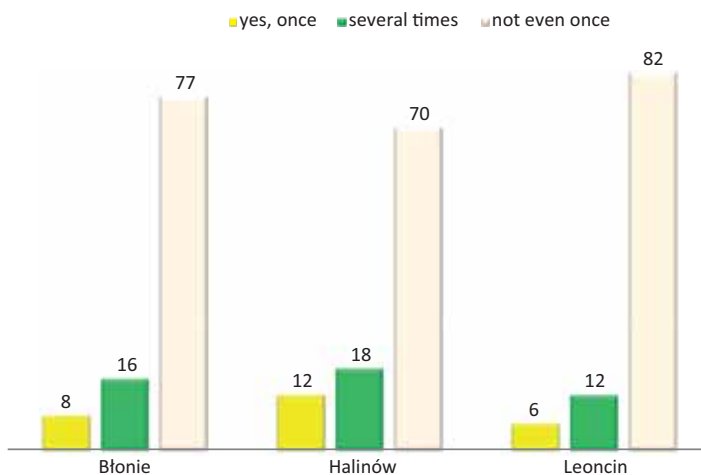


Figure 4.33. Interest in local land use plans during last 5 years (%)

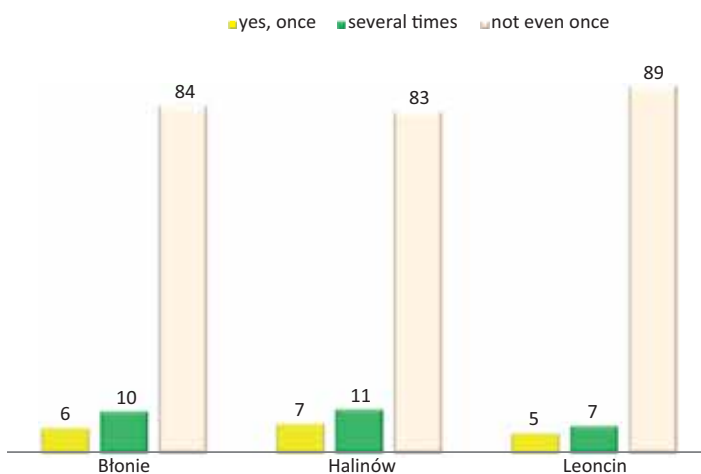


Figure 4.34. Personal participation in public meetings on land use plans (%)

This question is especially justified in the context of opinions concerning particular, and common interests of municipalities in the WMA. While asking respondents about the main goal of development policies, we wanted to identify what expectations were held by inhabitants towards the future of their municipality.

These expectations needed to be confronted with ideas and opinions about the situation in broader spatial context, which must be considered in such specific case like the WMA. For this confrontation the problem of creation of Green Ring around Warsaw was selected. Respondents were asked a question, whether the Green Ring should be formed even at the cost of municipalities' economic development. The concept of the Green Ring appeared about 50 years ago, and since then it has been discussed by planners from local and regional levels. The potential to create the Green Ring is shrinking, because of suburbanization and urban sprawl. However, still there are forests, agricultural land, and open spaces around Warsaw that in fact constitute the Green Ring. The problem is how to protect it, and make it a part of space that will not be transformed for any other purposes. Obviously, parts of the Green Ring are located in different municipalities. Municipalities do not have to see the value of the Green Ring from their local, specific perspective. The Green Ring, however, is a vital part of the ecosystem of the WMA, and from sub-regional perspective is seen as an important element of spatial structure.

Although the respondents selected economic development of their municipalities as the most important goal of future policies, they were ready to accept formation of the Green Ring at the cost of their municipalities economic development. The highest acceptance was received in Błonie: 40.3% agreed and 23.5% strongly agreed with such a solution. In Leoncin similar number of respondents supported this idea. In Halinów there were about 10% less supporters; however, 39.8% voiced neutral opinion – acceptance with some reservations (Fig. 4.35). This proves, that basically in all municipalities the respondents see the importance of the Green Ring, and they perceive benefits of it also for their municipalities. It is characteristic that many supporters come from Błonie, which experiences dynamic development and transformation of land use pattern. Respondents from Błonie pointed out earlier, that what was missing in their municipality was open space and recreational areas. They also critically evaluated both the landscape and the quality of natural environment in their municipality. In Halinów, again, pragmatic respondents want to live in good environmental conditions, but also look for opportunities for their municipality development, which is connected with land use change. This might be in conflict with the necessity of protection of environment in order to realize the concept of the Green Ring.

Development problems and challenges of the WMA result from the fact, that this area is a complex one in terms of spatial and functional structure, and at the same time fragmented in terms of responsibilities for its development. The WMA consists of 72 municipalities, which function as independent legal entities. Dynamic development processes are polarized, and different municipalities benefit from them (or bear costs of development) in different ways. Warsaw is the engine of the WMA development, and attracts investments and people. Diffusion of development impulses from Warsaw is selective in terms of destination and their nature. The first question is to what extent Warsaw stimulate development of smaller municipalities in the WMA? Then, what are the relationships between Warsaw and these municipalities as well as relations among the municipalities themselves?

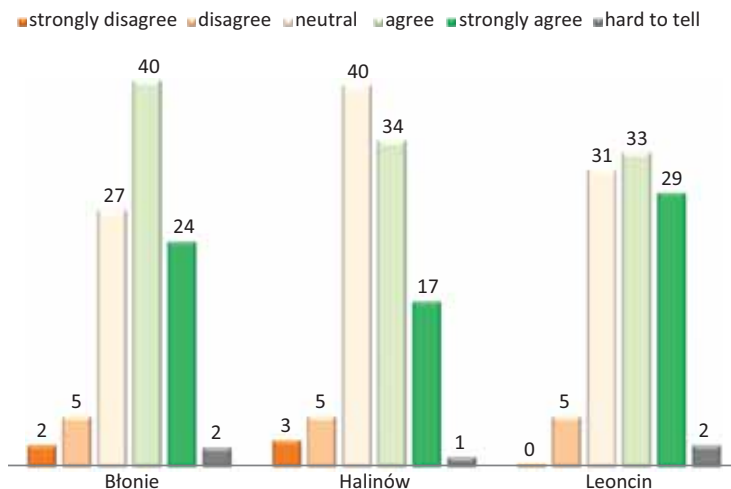


Figure 4.35. Green belt around Warsaw at the cost of municipalities' economic development (%)

According to respondents, the municipalities in the WMA develop mainly due to the proximity of Warsaw, not because of their own assets (Fig. 4.36). In Błonie 43% of respondents agreed and 31% strongly agreed with this statement. In Halinów, respectively, it was 41.8% and 17.3%, in Leoncin 43.5% and 23.3%. The role of Warsaw in the municipalities' development is very important. Own assets of municipalities are seen rather as complementary ones. These statements support earlier opinions about the "closeness" of Warsaw. Warsaw is seen as a key player in the area. Respondents see as a natural reaction the cooperation of their municipalities with Warsaw. The closest relationships, the more opportunities for development incentives is coming from Warsaw. This believe seems to be justified under one condition: that municipalities are prepared for this cooperation and have their own offer, that is not only attractive from the Warsaw perspective, but also from the perspective of municipality's long term development.

Expectations that municipalities would cooperate with Warsaw are very clearly expressed by the respondents (Fig. 4.37). In Błonie 75% of them support such a cooperation, in Leoncin 76.3%. Some reservation is expressed by respondents from Halinów (25.3% neutral answers). As mentioned earlier, this municipality is on its own, clearly defined path of development. Relations with Warsaw are perceived as strong and important, but the respondents present very careful approach to all issues that might have an impact on their municipality development. They are afraid of potential constraints, or other negative influences.

This is confirmed by opinions about correctness of the statement: 'development of my municipality can not be subordinated to the interests of Warsaw, although Warsaw dominates in the WMA and plays a role of development engine'. 59% of respondents from Halinów agreed, and strongly agreed with this statement. In Błonie and Leoncin the number of those who supported this opinion was slightly lower, respectively 51.6% and 52.8%. Distribution of answers proves that

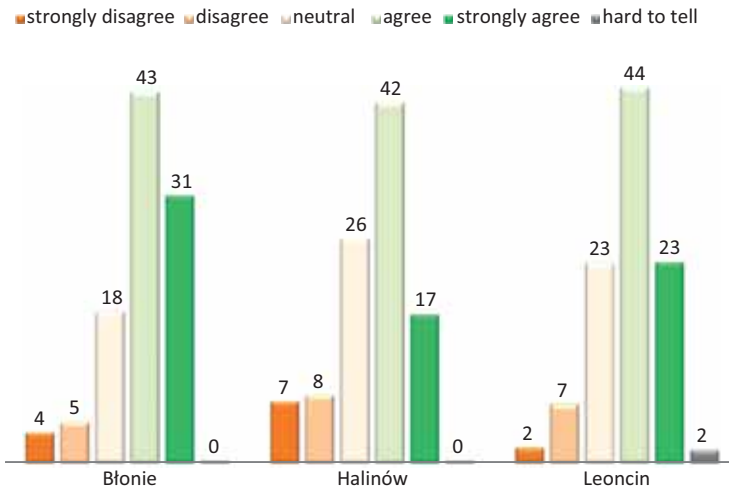


Figure 4.36. The main role of city of Warsaw in the development of peri-urban municipalities (%)

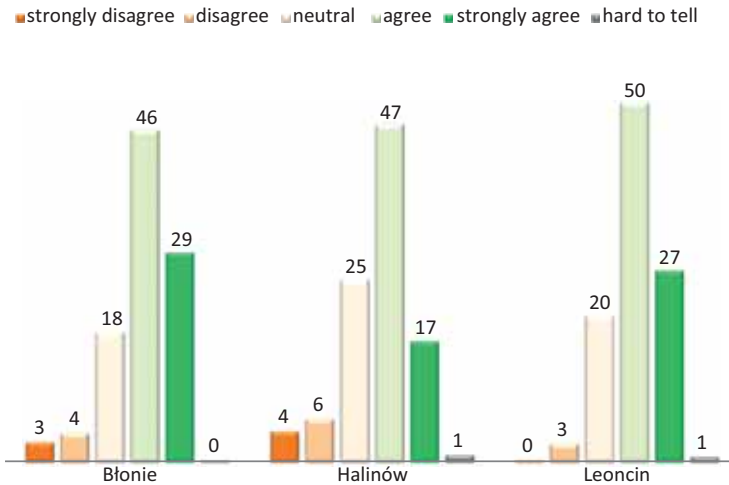


Figure 4.37. Municipalities should cooperate with Warsaw (%)

respondents in all municipalities are concerned about Warsaw’s potential aggressive policy. This attitude might be converted into resistance against cooperation with Warsaw, that was evaluated earlier as something natural and needed. It is also interesting, that relatively large groups of respondents voiced neutral opinions on this matter. It proves an eclectic approach to the issue of cooperation generally, and to the position of Warsaw *vis-à-vis* smaller municipalities in the WMA. Cooperation seems to be an inevitable evil, which is both dangerous and attractive, because it is so needed. No one can assure that cooperation will be smooth

and fruitful for all parties involved in it. Lack of experience with cooperation makes respondents suspicious.

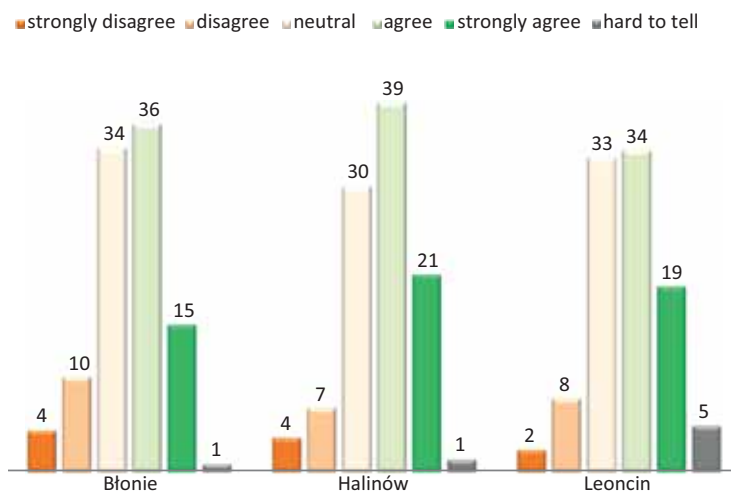


Figure 4.38. Development of the municipality cannot be subordinated to Warsaw interests even though Warsaw is an engine of economic growth (%)

The practice of development of the WMA proves, that municipalities rather rarely undertake common projects, or try to harmonize their development policies with other municipalities. Although awareness of being part of “metropolitan puzzle” is present among local governments representatives, it is not being translated into practical actions. And this is what is perceived by respondents as necessary: inter municipal cooperation. The majority of respondents see the need of this cooperation, because they are part of a functional area, and their development depends to the large extend on what is going on in neighboring municipalities. Less than 10% of respondents in all municipalities questioned the necessity of inter municipal cooperation (Fig. 4.39). Basically, cooperation among municipalities is seen as equally important as cooperation with Warsaw. In Błonie 45% agreed and 24.5% strongly agreed with this statement. Respectively in Halinów it was 44.5% and 16.5%, and in Leoncin 45% and 28.5%. Halinów, although many respondents supported the idea of cooperation, presents itself again as an exceptional municipality, hence almost 30% of its respondents voiced neutral opinion.

Cooperation requires consensus on development priorities at supra-local level, and the readiness to reach compromise on problematic issues, which result from different development options adopted by specific municipalities. The compromise might mean resignation from some plans. Trade-offs are part of negotiations in policy making process, and require long term vision of development in order to accept solutions that, at the first glance, are not rational from the specific municipality’s perspective. In fact, they might be pragmatic and opening development opportunities in the future. Small groups of respondents seemed to be

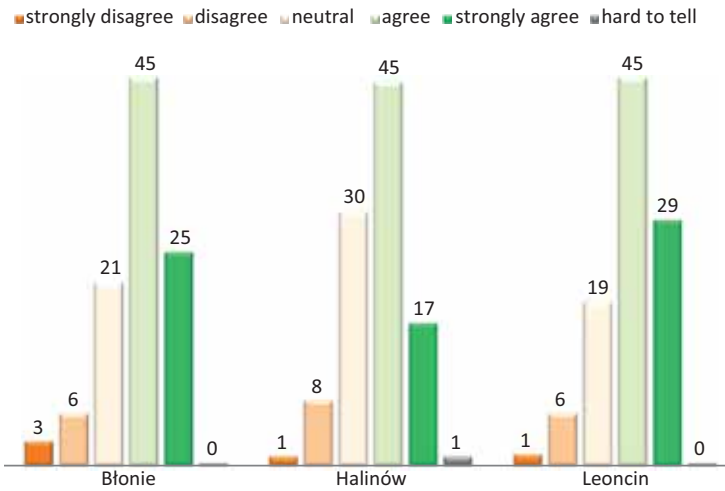


Figure 4.39. The need for cooperation among municipalities is needed – they depend on each other (%)

aware of the need of the compromise. About half of them stated that “development of my municipality is much more important than development of the WMA”. That was the opinion of 49% of respondents from Błonie, 61.3% in Halinów and 49.8% in Leoncin. They agreed, or strongly agreed with this statement (Fig. 4.40). Those who answered earlier, that cooperation at different levels (with Warsaw and among municipalities) was a must for well-being of their municipality, disagreed with this opinion (in Błonie 18.8%, Halinów 5.8%, Leoncin 20%). Generally, declarations about the need of cooperation are not supported by willingness to admit that supra local dimension of development is more important than the local one. This is not surprising but shows, that dilemma concerning cooperation and coordination of development efforts is not only the dilemma of local governments. In this case both inhabitants and local governments speak the same language. It might be stated that the lack of local government efforts to cooperate with Warsaw, or other municipalities is paradoxically legitimized by the respondents. Distribution of answers in Błonie and Leoncin are similar. It seems that two factors played here an important role: functional links with Warsaw and other municipalities (Błonie), and economic situation of the municipality (Leoncin). The more links and dependencies and the worse economic conditions, the less acceptance for this statement. It is interesting that relatively large groups of respondents presented neutral opinions (Błonie 32%, Halinów 31.5%, Leoncin 29.8%). It might be interpreted as appreciation of the fact, that some problems that inhabitants experience result from processes and phenomena taking place in other municipalities within the WMA. Compromise and flexibility in approach to development priorities may contribute to solving these problems.

As depicted earlier, development processes in the WMA have spontaneous character. Increase of spatial range of impact of Warsaw is not accompanied by development of technical infrastructure. Deconcentration of production and

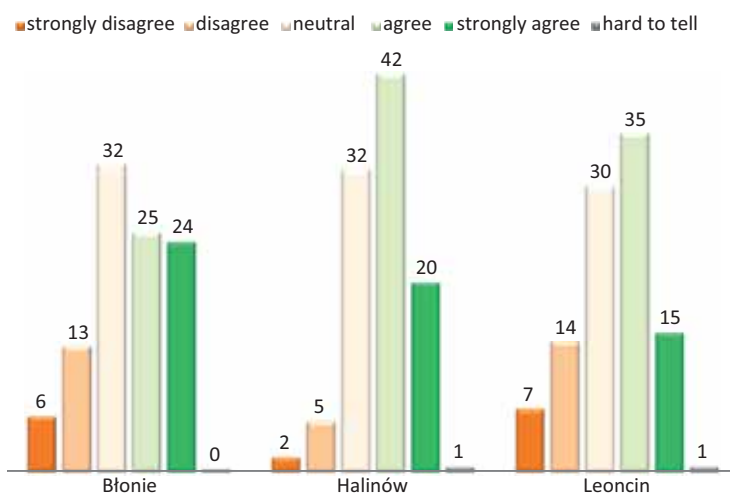


Figure 4.40. Preference given to development of the municipality (%)

service functions from the central city of the WMA is progressing slowly. Residential functions are “exported” to suburbs and peri-urban areas. That is probably the most visible result of the impact of Warsaw on spatial and functional structure of the WMA. Since Warsaw remains the main place of work, also for the majority of new settlers from the WMA municipalities, it creates serious transportation problems. It may explain, why respondents see Warsaw as the city which develops without taking into consideration the needs and interests of other municipalities in the metropolitan area (Fig. 4.41). On this issue the distribution of answers in all the municipalities is almost the same. 20–25% of respondents strongly agreed that Warsaw develops independently, 30–40% agreed with this statement. In the context of these answers one may state that Warsaw’s development brings “colonization” of other municipalities from the WMA. They are used as sources of labor force or places where functions that serve other Warsaw’s purposes are located. More than 25% of respondents voiced neutral opinions on this matter. Generally, these and other answers obtained from the respondents point out the necessity of coordination of activities performed by municipalities in the WMA, including Warsaw. That is the biggest challenge for sustainable development of the WMA. Experience of different initiatives from the last couple of years proves that technically the individual municipalities are prepared to be part of coalition, working together on plans and their implementation. At the same time there is a lack of culture of cooperation, and, resulting from it, a lack of basic skills to reach consensus, and to work out institutional and organizational solutions which will facilitate such cooperation.

Local governments, as mentioned earlier, are responsible for the development of their municipalities. They are supposed to prepare development strategies, and are obliged to prepare different programmatic documents that set paths of their developments. Local development plans shall serve first of all interests of individual municipalities. At the same time, they can not ignore what is going on in

the surrounding areas. This is because plans that lack broader context may well serve local communities, but generate conflicts at supra local scale. Eventually, this may have negative influence on development potential and impede development processes of specific municipality. Respondents were asked to voice their opinion on the statement: “development plans should be prepared by municipalities autonomously, regardless of potential conflicts they may generate”. Reactions to this statement can be interpreted as a call for coordination of planning activities. In Błonie and Leoncin about 33% of respondents did not agree with this statement. In Halinów 20% were against this statement. If we add those respondents who articulated neutral opinions, we will have the majority of respondents who see the need for planning coordination. There is no doubt that, despite some differences in terms of distribution of answers, respondents from all municipalities are skeptical when it comes to entire freedom of local governments, while preparing development plans. In fact, during interviews respondents strongly supported coordination of planning activities concerning development of technical infrastructure, protection of natural environment, and investments in social infrastructure (Fig. 4.42).

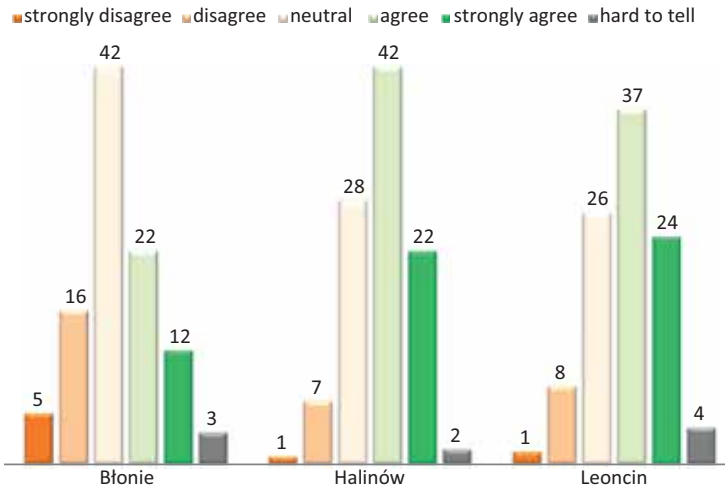


Figure 4.41. Warsaw develops without taking into account needs and interests of peri-urban municipalities (%)

Part of the problem of development of rural-urban regions is the lack of culture of cooperation, as it was mentioned earlier. Since 1990, the year when local government structures were established at the municipality level in Poland, local governments enjoy autonomy in deciding about directions of their development, and possess planning power that allows them to enact local land use plans. While conducting their own economic development policies municipalities use different instruments to bring development incentives to local economies. New investors are perceived as one of the most important incentives, ones that usually bring noticeable results in relatively short time. What is observed

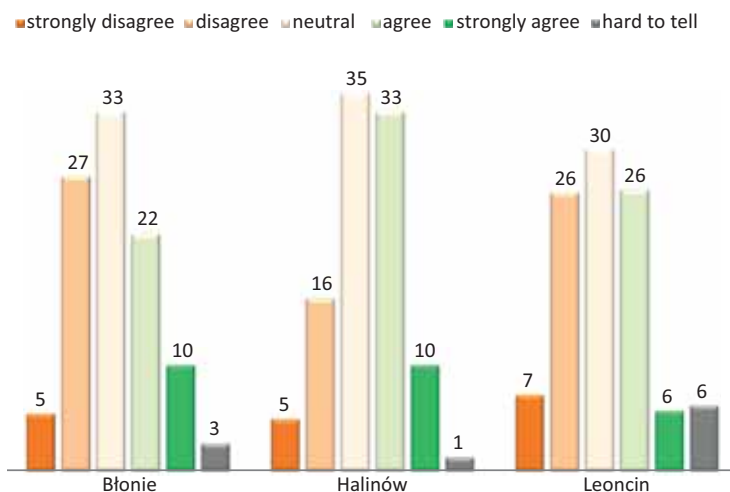


Figure 4.42. Development plans should be prepared by individual municipalities (%)

is competition for new investors, which results in strengthening their position *vis-à-vis* local governments in negotiations about conditions for future investments. Moreover, this competition makes cooperation among municipalities difficult or impossible, since they compete for the same, limited resources. This fact was noticed in Błonie. 35.5% of respondents pointed out competition for investors as a factor that impeded inter municipal cooperation (Fig. 4.43). However, a big group of respondents (47.8%) voiced neutral opinion in this respect. In case of Leoncin 17.5% of respondents did not know how to respond to this statement, and only 19% of them blamed this competition for the lack of inter municipal cooperation. In Halinów 23.8% of the respondents 'strongly agreed' and 'agreed' with this statement, while 58.3% voiced neutral opinion. Inhabitants of the municipalities do not have to know how their local government operates, in terms of what is being done to attract investors. However, it might be assumed, that inhabitants possess some knowledge about it from observations of changes that occur in their municipality. Thus, it might be stated, that the competition for investors is not the main obstacle in establishing cooperation among municipalities. The situation of the three municipalities might be used to indicate, that depending on local development conditions, municipalities should be interested in bringing different investors, which will match local needs and existing assets. It means that the subject of potential competition might be different for different municipalities and, additionally, will depend on their specific situation and development plans.

Cooperation between municipalities may concern different problems and may take different forms. From the perspective of effective management of metropolitan area development formalized types of cooperation are the most important one. This types of cooperation require institutional setting and organizational structure. Moreover, formalized cooperation results in legally approved procedures,

that regulate relationships among cooperating municipalities. Usually, this type of cooperation brings necessity of establishing a legal body, that will manage the network of cooperating municipalities. The legal body may operate within the existing structure of self government. It may also take other forms allowed by the law. Cooperation within metropolitan areas often means obligatory transfer of some competencies from the municipalities to the upper level – to the legal body managing cooperation of municipalities. Transfer of competencies is then followed, which is obvious, by transfer of some funds. It is this aspect of cooperation that is not popular among local governments. In our studies we verified, whether this option was acceptable for inhabitants from the three municipalities.

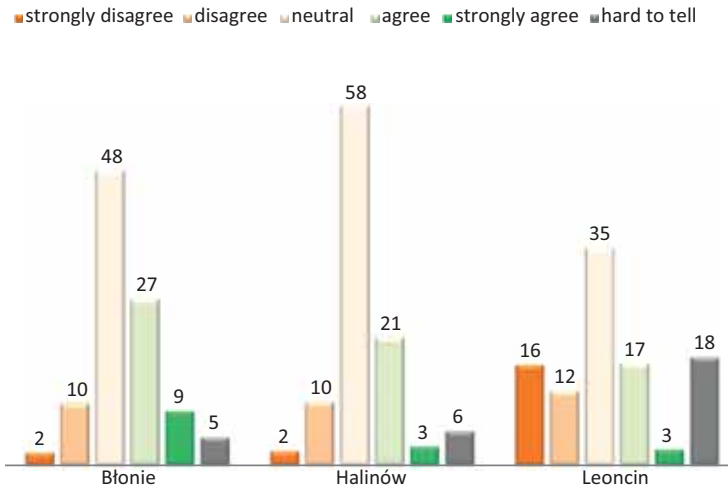


Figure 4.43. The municipality competes for investors and that's why cooperation between municipalities is difficult (%)

It turned out that respondents from Błonie and Leoncin presented pragmatic approach to a reduction of competencies of municipalities, if this might result in better realization of local government tasks. In Błonie 55.5% and in Leoncin 59% of respondents voiced this opinion. In Halinów it was only 39.6%. At the same time, 32.5% of respondents from Halinów declared 'rather no' and 'definitely no' for reduction of competencies of their municipalities. This reaction is similar to their reaction to other ideas that may limit independence of the local municipal government. Leoncin is the municipality with the weakest base for economic development. It may explain why respondents there are ready to make their local government sharing power with other bodies, if that will be instrumental in solving this municipality development problems, and would eventually result in better living conditions.

Establishing of some kind of a body that will take care of development of the WMA has been an important part of discussions about how to manage metropolitan growth. In fact, during many meetings this was the issue that entirely dominated discussions. Answers from the respondents proved their ambiguo-

ous approach to local governments' readiness and skills to cooperate. In Błonie 22% of respondents stated that local governments: "would rather cooperate and any additional body like management board was not needed". Respectively, 32% and 18.3% respondents from Halinów and Leoncin supported this statement. Statement that: "local governments would rather cooperate, but the management board is still necessary", was supported by 25% of respondents in Błonie, 31.8% in Halinów, and 27% in Leoncin. Large number of respondents in all municipalities (Błonie 28.3%, Halinów 20%, Leoncin 35%) agreed with statement that: "municipalities would not cooperate smoothly, and management board is very much needed". It is also interesting that in every municipality more than 10% of respondents (in Błonie it was 20.5%) answered "hard to tell". Relatively small number of respondents admitted that: "municipalities would not cooperate, but the management board was not needed". Those respondents, who agreed with this statement represent a group of skeptical and disappointed inhabitants, who perceive public administration institutions as inefficient and unable to perform their functions effectively. Generally, the necessity of establishment of some kind of a body such as the as management board, was supported in all municipalities. Even in Halinów respondents see the importance of well structured, and well managed cooperation. These opinions are diagnostic and indicate, that the concept of voluntary cooperation model, popular among local governments, was not perceived by respondents as realistic one. In fact, answers from the respondents can be interpreted as a call for establishment of organizational structure that will facilitate development efforts undertaken in the WMA.

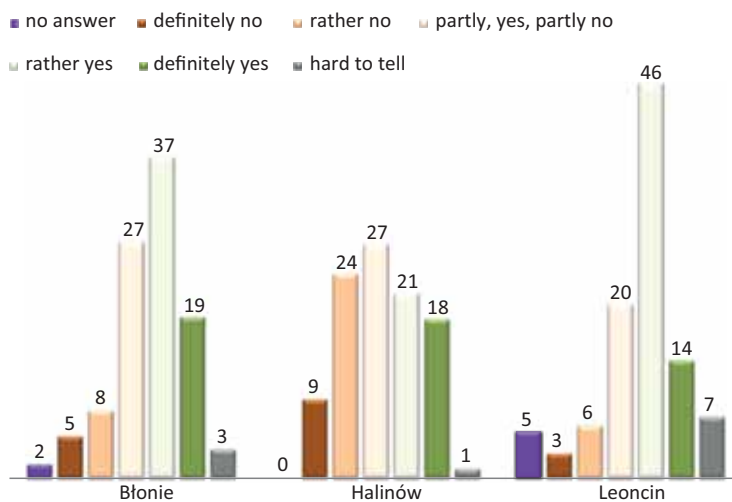


Figure 4.44. Supporting the reduction of municipality's powers (%)

It is also worth to point out the fact that many respondents selected "hard to tell" option. It might be interpreted as another prove for citizens' low involvement in public life at the local level. Acquaintance of local government plans and

measures that are used to govern municipality development is fundamental for conscious social participation. Local communities should elect their representatives intentionally, understanding that their decisions will determine future paths of development. Low scores of social participation in spatial planning processes, as described earlier in this chapter, together with the number of undecided respondents indicate, that citizens' involvement in public life of their municipalities is not satisfactory. Social legitimization of conducted policies is needed to mobilize endogenous resources, and to avoid conflicts which may have an impact on development both at local, and supra-local scale.

The WMA experiences urban expansion, which is a direct result of economic growth and demand for space – growth related to processes of social development. Transformation of economy contributes to changes in the spatial structure of urban agglomeration of Warsaw that acquires new characteristics. One of its forms is presence of peri-urban areas. As presented earlier, there are a number of issues vital for sustainable development of the WMA that need to be addressed. Among them are inhabitants' expectations towards future development of their municipalities and social participation in policy making. Answers received from the respondents also pointed out complex relationships between Warsaw and the smaller municipalities in the WMA. There are different conflicting interests, but also opportunities that derive from mosaic pattern of distribution of functions, and variety of resources and assets of specific municipalities. Two issues: local autonomy and inter municipal cooperation seem to be the key issues, that would determine to the large extend the development processes at the local (municipality) level and supra-local (metropolitan area) level. The way that local governments exercise local autonomy is critically evaluated by the respondents. Expectations towards building working relationships between individual municipalities within the WMA were expressed by the respondents, but simultaneously, doubts concerning capability of local governments to cooperate were formulated.

Information obtained from the respondents about perception and evaluation of peri-urban areas, about driving forces that determine their development, and about expectations concerning preferred paths of development provide arguments to formulate the opinion, that a new approach to relationships between “rural” and “urban” is needed. This is because the urban expansion scheme is not a simple one-way process. It also generates responses and changes in peri-urban areas. These responses and changes occur in individual municipalities, but also have an impact on functioning of the whole metropolitan area, or its large parts. In the transportation sector, e.g. peri-urban settlements shift towards private automobile. Peri-urban local economy is getting more diverse, as a reaction to rising demand from increased number of population.

It might be anticipated that peri-urbanisation will have, in the future, much broader impact on development processes in the WMA. This impact will depend on different development plans and policies prepared and implemented at the regional and local scale. Plans and policies have to respect the fact that environmental capacity of peri-urban areas is limited, and their use as assets has to be strictly controlled. Information collected during field study shows, that there are economic, ecological, and residential agendas in competition. Thus, the leader

is needed, to guide discourse on peri-urban areas development, in order to reach consensus on forms and intensity of their development.

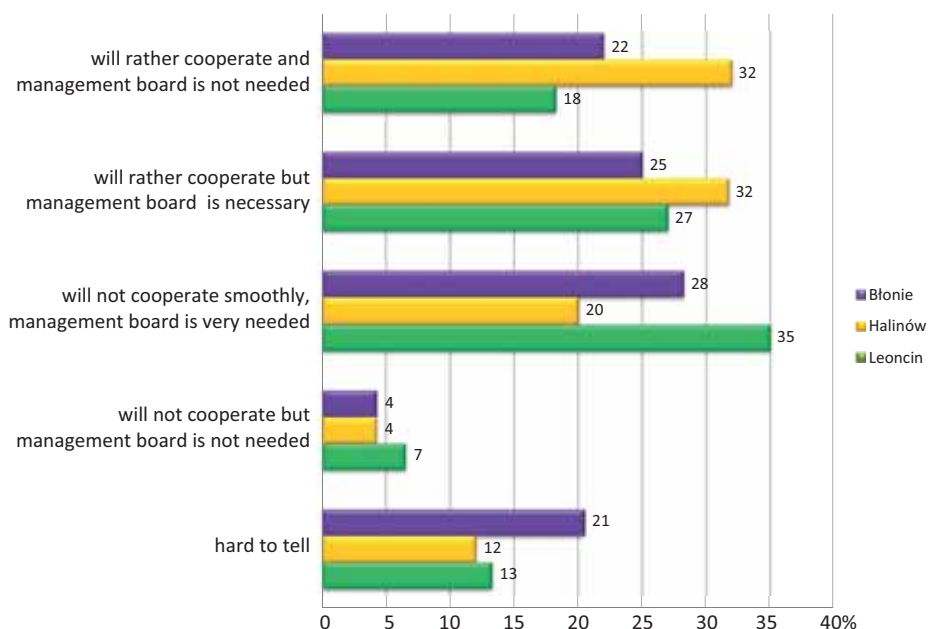


Figure 4.45. Opinion concerning voluntary cooperation versus establishment of management board

4.6. Peri-urban areas in development plans and opinions of local governments representatives

All three municipalities are equipped with planning documents concerning economic, social and spatial development. Under Polish conditions, the main planning document that presents spatial development policy of a municipality is a *Study of the Conditions and Directions for the Spatial Development*. Municipalities also prepare *Land Use Development Plans* that determine location of specific functions. The first document is obligatory. If the Study of the Conditions and Directions for the Spatial Development (*Studium...*, 2010) does not indicate the necessity of preparation of land use plan for the municipality or its specific territories, and the Municipality Council does not see this necessity either, then the municipality can function without land use development plans. In this situation location of investments is decided in the administrative procedure, when every single proposal from investors is analyzed. This analysis, of course, lacks broader

spatial context. This is one of the reasons, why this procedure is criticized and blamed for contributing to spatial chaos. However, this is not the case of the three municipalities, where planning documents have been prepared, and spatial development is ruled according to them. Błonie, Halinów and Leoncin possess also development strategies and local development plans. Since the size and character of the three municipalities are different, their programmatic documents have different content in terms of its substance and level of details.

The analysis of these documents provides interesting insights into approach to development of municipalities of peri-urban character. Development strategies are focused on solutions of specific problems, mainly of economic nature, although quality of life and living conditions are also listed among the main goals. Local dimension of development is superior in these documents, and relations with other areas are often disregarded. The issue of rural-urban relations is not directly addressed in planning documents. If these relations are mentioned, this is usually in the context of possible further expansion of urban functions. Rural areas are defined as areas with predominantly agricultural functions. In Błonie they are also treated as potential areas of location of recreational functions.

In all municipalities an increase in the number of population is envisaged, as an important factor that will have an impact on economic development in the future. It concerns Leoncin and Halinów, which plan to attract new settlers – including in-migrants from Warsaw, as well as Błonie, which has plans to strengthen its human capital. Economic development is a priority, justified, among others, by high level of registered unemployment in Halinów. Generally, development plans are focused on creation of basis for economic development; issues of natural environment are mentioned in the context of a need of environment protection. Halinów provides good examples of discrepancies between municipality's resources and assets, and its plans for the future. According to the development strategy, quite extensive area might be developed as an area with productive and service functions. Much smaller area has been ascribed residential function. Results of SWOT analysis show, however, that there is a lack of technical infrastructure to serve even existing areas with residential functions (underdeveloped sewage system). Yet, it is planned to develop this function according to the strategy that points out Halinów's chances for the future in terms of location near Warsaw, as well as the municipality's environmental attractiveness for in-migrants. The new Study (*Studium...*, 2010) of Conditions... (adopted in 2010), and new land use plans prepared for different parts of Halinów define areas for residential function development. In Błonie plans for economic development are connected with development of logistic centers located in the municipality. This is not, of course, the only idea for development. However, this type of investment is land consuming and is mentioned here in the context of answers received from respondents, who stated that their municipality was not the best place for location of such facilities. Agro-tourism and ecological farming are the two activities that are supposed, among other, to stimulate the development of rural areas.

Generally, strategies and development plans will generate increasing urbanization pressure, since they contain programs focused on attracting new inhabitants and businesses. It is interesting that diagnostic parts of development strate-

gies include information on existing or potential urbanization pressure, but there is a lack of clear statements on development policies' responses of planning and management character (except restrictions concerning areas protected by law). In Halinów the Study sets parameters for the size of a plot that can be developed for residential purposes (single family house). Still, it is clear from SWOT analysis, included in the document, that this house will have to be equipped with septic tank, and that the area where this house, or houses are located will not be served better by transportation system than others, developed earlier. The situation might be, and probably will be even worse in the future.

All three municipalities have natural environment protection plans. They are aimed at improvement of quality of natural environment and living conditions. It seems that these documents lack clear link with plans concerning economic development. Although suburbanization and urban sprawl are progressing rapidly, planning documents include measures and undertakings that are supposed to cope with current, accumulated problems.

Additional information collected during discussions and interviews with representatives of local governments support the opinion, according to which rural-urban relationships are missing in thinking about economic and spatial development of peri-urban areas. The context of the WMA, and the importance of vicinity of Warsaw for their development are seen by local government representatives. However, they focus their pro-development efforts on their own municipalities. They see the path of spatial development of the WMA as spontaneous and uncontrolled. And they put the blame for negative consequences of development on the system of spatial planning, which they describe as lacking coherence and effectiveness.

What was missing in the planning documents, and was present in discussions with local government representatives, was increasing social differentiation in the WMA. Income disparities are translated into social stratification. Uneven development of municipalities may result in social exclusion and generate social conflicts. Thus, development strategies should ensure sustainable development in its social dimension. It shall also be emphasized, that in discussions the issue of environmental awareness was pointed out as an element that is often neglected in preparation of economic development plans. This important statement was formulated by those who are involved in policies development and/or plans preparation. Representatives of local governments pointed out the same fundamental problems, as did the respondents, of peri-urban areas development: problem of physical accessibility of these areas, and access to places of work and services. The system of railroads is developed poorly, and inhabitants have to rely on road transportation, including public transportation. The latter one, however, does not meet inhabitants' expectations. Road traffic generates pollution, forces commuters to spend hours in cars. In the planning documents improvement of transportation infrastructure is listed as one of important goals of development. However, achievement of this goal is not treated as a prerequisite for other development undertakings. This is more of interventional activity, that is supposed to improve current situation.

The supra-local dimension of municipalities' development is perceived by local government representatives. They see numerous resources and assets possessed

by the individual municipalities in the WMA. And they admit that, due to underdevelopment of transportation system, polarization of development processes, inefficient management of development processes, and fragmentation of the WMA in terms of jurisdiction of specific local governments in the area, these resources and assets are not used properly. They pointed out that the importance of rural areas (agriculture, or open space as valuable assets) is underestimated, and their future is in danger, because the current paths of development of Warsaw and the WMA result in formation of growing “an aggressive urban octopus”, that consumes more and more land. In order to stop the spreading of this “octopus”, cooperation among local governments from the WMA is needed. Otherwise, further development of Warsaw as metropolitan city will be hindered, or stopped. The same concerns its surrounding areas.

As stated in the earlier parts of the chapter, the respondents perceived local governments as passive agents of change in their municipalities. Perspective of local governments is a little different. They stated that the problems related to their municipalities development has become burdensome over the period of the last two decades, when Warsaw acquired metropolitan functions, and the metropolitan area has been shaped. They also admitted that development of local democracy was not followed by appropriate changes in regulations concerning spatial development management. The planning code enacted in 2003 increased liberalism, by disqualifying previously existing hierarchical planning system, and providing for the possibility of instant, investor-driven development. When development is based on the private acquisition of undeveloped agricultural land, this may result in a totally dysfunctional configuration of built-up areas, including huge surplus costs for construction and for operation in particular. It may also lead to further “colonization” of the countryside, and local governments’ possibilities to limit this colonization process are very limited. That is why local governments’ policies are seen as passive. Systemic changes in regulations concerning spatial planning and management of metropolitan areas are needed, to allow local governments to shift their focus from ‘problems of transition and restructuring into opportunities brought by them. Only then, efficient responses to transformation of peri-urban areas, such as building resilience and adaptive capacity of municipalities, will become part of the development policies.

4.7. Local dimension of rural-urban regions' development – the WMA experience

Studies on peri-urban development in the WMA have proved that functional differentiation of the region has been translated into formation of specific types of peri-urban areas. Development processes are not distributed evenly in the region. Different resources and assets are utilized with different intensity. Speci-

ficity of peri-urban areas depends less on their distance from Warsaw and physical accessibility, than on local development conditions. Development potential and current state of spatial development – land use and infrastructure, seem to be crucial measures of attractiveness of specific municipalities for the inhabitants, and the main determinants of their future development. Social and economic structures of municipalities are mixed, which may prove that these areas are transformation areas. This is also why it is the specificity of a given municipality, not social and economic characteristic of respondents, that is the main factor explaining the perception of peri-urban areas, expectations and development priorities.

Peri-urban areas in the WMA are attractive as place of residence. The most important component of living conditions for inhabitants, in all three municipalities is natural environment. Those inhabitants who are mobile, who migrate and change place of residence were more critical in evaluation of living conditions and their expectations concerning available services, commuting conditions, etc. Although development trends, bringing in more people and businesses are perceived by the inhabitants, they are not yet seen as threatening the quality of living conditions. That is why the respondents did not expect actions from local governments to limit the intensity of peri-urban areas development.

Regardless of the type of municipality, their inhabitants perceive Warsaw as a close city, but not attractive enough to move in. Warsaw is seen as a crowded place, with heavy traffic, noise, and high costs of living. Warsaw is seen as more attractive by people who are looking for specialized services (culture, leisure, recreation, education) or for attractive jobs.

Although the respondents perceived their municipalities as parts of the WMA, they expected local governments first of all, to secure conditions for economic development of their municipalities. Despite some differences, inhabitants from all the municipalities also saw the necessity to protect open space.

Results of interviews and additional information obtained from planning documents, as well as from local governments representatives allow us to formulate a statement, that neither legal provisions, nor plans and practice of peri-urban areas development contribute to sustainable development of the WMA. The inhabitants do not participate in activities which are crucial for their municipalities' development. Plans lack coherence and investments are focused on current needs. Additionally, Warsaw is developed without taking into account the situation in surrounding municipalities. The respondents saw the necessity of coordinated planning and management activities at the metropolitan level; they were also skeptical when it comes to possibilities of voluntary cooperation among the individual municipalities in the WMA. They have suggested an establishment of management structures responsible for activities and undertaking that have sub-regional character, and could not be managed by single municipalities. The necessity of coordinated planning and management was also seen by local government representatives. Still, there is no concrete initiative to meet these needs.

Peri-urban areas development in the current form results in land consumption that contradicts a normative ideal of spatial planning and compact development.

Peri-urban land consumption is usually detrimental to the environment in different regards. Its impact reduces the ability of nature to fulfill human requirements, and thus impairs ecosystem services in various ways. Peri-urban areas development reflects on one hand social, economic, and cultural changes; on the other hand it is a diagnostic feature of systemic conditions that create environment for such development.

Future development policies, at both the local and supra-local level, should have clearly defined agendas to respond to problems and opportunities identified in the rural-urban region. These agendas must be defined in cooperation among different actors involved in development processes. Fragmented policies will not be robust enough to face future challenges. Development policies must be integrated. The peri-urban areas development requires in its nature multi-level, horizontal, vertical and sectoral integration between organizations, sectors and levels. Development policies must focus more on mobilization of endogenous resources (financial, physical, and human) through partnership between different actors. The practice of preparation of separate development strategies and spatial development plans by individual municipalities will lead to destruction of assets found in peri-urban areas.

5. DEVELOPMENT SCENARIOS AND PROJECTIONS OF LAND USE CHANGE

5.1. The Region of Warsaw: spatial development trends

In the previous chapter questions concerning future land use change were considered within policy context from the perspective of selected peri-urban municipalities.

Here, the focus of analysis shifts, so as to involve the Warsaw metropolitan area as a single functional unit. Evolution of its land use pattern is projected into the future, while referring to two alternative development scenarios. Unlike earlier in this report, when the ICPP framework, based upon factors of global change was referred to, the scenario assumptions are adjusted to conditions and interdependencies that seem to prevail in the study region. The data base used for projection purposes pertains to years 1990–2000, with the projection horizon extending till the year 2025.

In the region of Warsaw the relations between urban, peri-urban and rural areas have undergone profound changes over the last several decades. Under the so-called centrally planned economy investment policies, which rested by and large within the state domain, generally favoured the development of middle-sized over the large urban centres. Still, the position of capital cities was in this respect quite exceptional. In addition to heavily centralized political functions, as well as industrial functions, they had to accommodate the typically overgrown state administration dealing with economic planning, management and control functions. Hence, similarly to other national capital cities in both the East and the West, Warsaw was exposed to strong pressures related to the growing demand for manpower and to in-migration streams.

The policy responses to these pressures underwent in fact some rather sharp turns. So did spatial consequences of socioeconomic and spatial policies. During the 1960s the so-called deglomeration policies were introduced, involving the toughening of restrictions on domicile registration within the city, and the relocation of some industrial establishments to smaller urban centres in the region. These measures brought about rapid population increase in settlements, both urban and rural, situated in the surrounding zone, beyond the administrative

boundaries of Warsaw, as well as a notable increase of commuting to work to the central city. This development, in reference to the concept of stages of urban development (Klaassen *et al.*, 1981), was later interpreted as a stage of Warsaw's *pre-mature decentralization* (Korcelli, 1990).

In the next decade the policy approaches changed radically, with an emphasis shifting from agglomeration costs to their benefits side. Implementation of the new planning doctrine of *moderate polycentric concentration* produced, in the case of Warsaw, extensive housing and infrastructural investments at the city outskirts, though still mainly within its limits. At the same time, raising disposable incomes, together with growing automobile ownership, were providing conditions for some segments of the population to supplement the cramped living space in a bloc of flats in the city, with the second home outside of Warsaw. This trend became very popular in the seventies and resulted in subdivision and conversion of numerous parcels of agricultural and wooded land into recreational use, typically within the radius of 30 to 60 kilometres from Warsaw. Such was the origin of peri-urbanization in the region. Its further development, however, was largely discontinued due to economic and political crisis that prevailed during the 1980s.

After 1989, as documented earlier in this report, both suburbanization, and the transformation of peri-urban areas in the region of Warsaw have been characterized by spatially varying intensity, with high overall dynamics accompanied by lack of spatial order, i.e. by typical urban sprawl phenomena. The zone of second homes from the 1970s has been partly invaded by new residential, as well as some commercial and industrial functions, connected with the globalized economy, while the prime recreational activities have moved further out into the region's rural hinterland.

5.2. Alternative future development scenarios

The debate on future development of the region, and the role of spatial policy in that process, has been going on since the early 1990s. The PLUREL project has provided an appropriate forum for the continuation of this debate. As a result of discussions at workshops held with participation of representatives of local government, professional associations, and other stakeholders, two scenarios were outlined, which formed the framework for the construction of alternative development projections. These projections extend till the year 2025, i.e. the time horizon corresponding to other scenario-based projections elaborated within the project. The scenarios pertain to the core part of the region, namely the Warsaw Metropolitan Area, the spatial aggregate delineated for the purpose of planning studies by the regional self-government authorities.

The first scenario is labelled the *Limits to growth scenario*; the analogy to the famous Club of Rome report being not coincidental. This scenario assumes exter-

nal economic conditions to be similar to those identified in PLUREL's A1 scenario – one of rapid economic growth based on technological and organizational progress. Under such conditions the city of Warsaw and the region experience continuing economic development, based on its differentiated array of metropolitan functions. The growth of employment, of new firms and housing estates is concentrated mainly within the city limits, as well as along major transportation corridors radiating from Warsaw. The city and its surrounding zone continue to attract migrants from other regions of Poland, and from abroad.

The policy response to this trend is very limited. The current practice of spatial planning and land use management prevails, with lack of vertical, as well as horizontal plan coordination, insufficient cooperation between local, municipal and regional governments, and the priority given to short-term development goals. Major infrastructural investments, such as construction of highway rings and extension of suburban and regional commuter train networks, are lagging behind the rapidly growing transportation demand. This implies the continuation of uncontrolled suburbanization and peri-urbanization in the region, contraction of green open space, aggravation of land use conflicts, gradual degradation of environmental assets, and, as a consequence – decreasing quality of life in the metropolitan area as a whole.

The accumulation of these dysfunctions leads to a crisis, marked by the turning point on the area's development trajectory. As assumed in the scenario, this would take place around the year 2020. At that time the overall growth rate comes to a standstill and changes into decline, as the resources on which the development process was based will have been partly exhausted. Warsaw and its region lose their attractiveness and the competitive edge held so far against Poland's other major urban centres, as well as *vis-à-vis* other capital cities in East-Central Europe. This is expressed in contraction of business activity, and an absolute decrease in population number.

In the alternative approach to the future development of the region – the *Spatial containment* scenario – suitable external conditions for economic growth are also assumed. Warsaw takes advantage of its development potential, the human capital in particular, and succeeds in expanding the knowledge-based sectors of economy.

These trends are paralleled by proactive spatial policy. Along with new legislation that introduces integrated planning for the Warsaw Metropolitan Area, the rational use of assets, and avoidance of functional and environmental conflicts in land use become the prevailing planning practice. Spatial policy priorities include the extension and up-grading of public transportation system in the region, regulation of the expansion of residential and commercial functions in peri-urban zones, implementation of the concept of Green Ring, protection of selected agricultural and recreational areas against the encroachment by urban functions.

These policies contribute to the improvement of living and working conditions in the region. Smaller urban settlements, situated in the metropolitan ring, attract specialized commercial and industrial activities, and develop into local nuclei for business and public services linked with the broader, regional labour

and consumer market. Decentralization of jobs results in a decrease of average commuting-to-work time, with the regional train system serving the bulk of long range daily travel. The Warsaw Metropolitan Area acquires some characteristics of a polycentric type of urban-rural region.

5.3. Modelling and projections of future land-use patterns

The two scenarios, as outlined above, constituted the starting point for the elaboration of alternative projections of future land use change in the region. For this purpose a *cellular automata* model has been applied.

One can observe a more and more frequent application of cellular automata in urban and regional studies (Takeyama and Couclelis, 1997). According to S. Wolfram (1982), "Cellular automata may be considered as (parallel-processing) computers, in which the initial configuration encodes the program and input data, and time evolution yields the final output". Referring to another source³, "Cellular automata are mathematical models of complex natural systems, containing large numbers of simple identical components with local interactions. They consist of a lattice of sites, each with a finite set of possible values. The value of the site evolves synchronously in discrete time steps according to identical rules. The value of a particular site is determined by the previous values of a neighbourhood of sites around it."

The cellular automaton is represented as the following⁴:

$$A \equiv (\alpha, S, N, f)$$

where: α – regular grid comprised of cells; S – state of cell;

N – the neighbourhood; f – transition rule of automaton.

Usually, the anamorphic plane (the map), covered with the grid of cells, is considered as the base in a study of land use changes with the application of cellular automata. The ranges of different land cover forms should be disjoint, but they should cover the whole area (with no undefined regions). It means that each cell should have only one state, and none of the cells in the grid should be undefined. This is the way of quantification of the space. There appears the model of two dimensional cellular automaton with appropriate, countable states. Usually one out of two types of neighbourhood is defined: von Neumann or Moore. The principle depend on the connections of edges and vertices.

³ <http://www.brunel.ac.uk/depts/AI/alife/al-wolf2.htm>

⁴ the theory of cellular automata was formulated by John von Neumann with the assistance of Polish mathematician Stanisław Ulam.

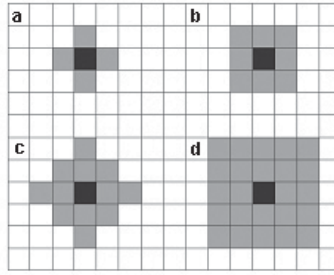


Figure 5.1. Different neighbourhoods of cellular automaton
 a – von Neumann, b – Moore, c – von Neumann-Moore,
 d – extended Moore

The transition rule defines the evolution of cellular automaton: the state of every cell in the centre changes in every step (from t to $t + 1$) depending on its initial state, as well as the initial state of cells in neighbourhood (in time t). The transition rules can be described by algorithm, with a table or a set of established rules. There are also boundary conditions important before the experiment (simulation) begins.

The initial conditions of the study of land use changes with cellular automata are pre-defined by the existing land cover.

Stephen Wolfram (2002, p. 231) classified all 256 one-dimensional, two-states cellular automata, distinguishing four main classes of their behaviour:

Class 1: the behaviour is simple, and almost all initial conditions lead to exactly the same uniform final state;

Class 2: there are many different possible final states, but all of them consist just of a certain set of simple structures that either remain the same for ever or repeat every few steps;

Class 3: the behaviour is more complicated, and seems in many respects random, although triangles and other small-scale structures are essentially always seen at some level;

Class 4: it involves a mixture of order and randomness: localized structures are produced which on their own are fairly simple, but these structures move around and interact with each other in very complicated ways.

Additionally, one should distinguish deterministic and probabilistic cellular automata. The latter are based on the averages of the neighbourhood cells, which in turn define the probability of the final states.

The tool used for modeling land use changes in the region of Warsaw area partly encapsulates the cellular automata models, and uses statistical and demographical data for spatial administrative units. Cellular automata models aimed at representing geographical systems genuinely should accommodate these aspects of reality. In the simulation context, the dynamic model calculates the overall growth of the system as a result of its internal 'macro' – dynamics and its exchanges with the world external to the model. The macro model 'forces' its growth, as a constraint, upon the cellular model. The latter allocates the growth to specific cells based on its 'micro' CA-dynamics.

The cellular space of cellular automata is structurally not different from the cellular representation of space in raster GIS; they both are essentially grid cell partitionings of a geographical area. This similarity enables an easy linkage between the GIS and the cellular automata model from conceptual and technical *point of view*.

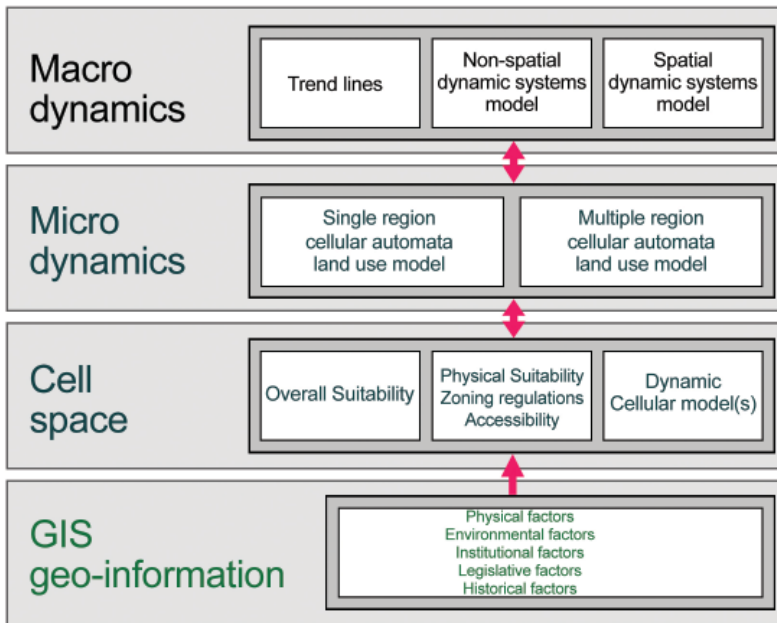


Figure 5.2. Scheme showing the role of cellular automata – based land-use models at different geographical scales

Source: RIKS (2010).

Projections of future land use change in the region of Warsaw, which represent possible spatial consequences of the alternative assumptions, as represented in the two scenarios, were prepared using the MOLAND model, based on CA algorithms. The modeling experiment was successful, in the sense of meeting the initial expectations, i.e. indication of the character and spatial extent of land use change. It should be emphasized that the results of simulations, stemming from the two scenarios are considerable different.

The cartographic visualization of land use development in the Warsaw Metropolitan Area (WMA), from 1990 to 2025, was generated using the application of Metronamica ML (multiple layer) framework⁵. The initial inputs – land feasibility

⁵ Metronamica is developed by the Research Institute for Knowledge Systems, Maastricht, The Netherlands. More information on the product can be obtained from: Hedwig van Delden, Director of RIKS (hvdelden@riks.nl) or the product website: <http://www.riks.nl/products/metronamica>

ty maps and numerical data – were common for the two scenarios. For the calibration of the model the following materials were required: maps of land use (these were available for 1990, 2000 and 2006), the transportation network, regional and municipal boundaries, as well as spatially disaggregated data concerning population and employment structure (by four economic sectors). In order to fulfill these data requirements, the land use maps based on Corine Land Cover system⁶ were prepared for the area included in the WMA. The same classes of land use were applied for all the projection intervals. It was assumed that the area's external boundary would not change until the projections horizon, i.e. the year 2025.

The control variables, which account for differences in results of the two projections, pertain to total population and employment change. In the *Spatial containment* scenario, the total population of the Warsaw Metropolitan Area was assumed to increase over the whole projection period, in accordance with the national statistical forecasts. In the *Limits to growth* scenario population growth continues until 2020, and is followed by a downturn, back to the 1990 level in the year 2025.

According to the *Limits to growth* scenario, the area covered by urban fabric is projected to increase by 11.4 percent till the year 2020, in comparison to its value for 1995, and then drop down by 12.8 percent between 2020 and 2025 (see: Table 5.1). Agricultural areas in the WMA would decrease by 8 percent during

Table 5.1. Simulated area (ha) of land use classes in WMA region 1990–2025
(*Limits to growth* scenario, Metronamica ML)

Land use	1990	1995	2000	2005	2010	2015	2020	2025
Green urban areas (1)	37706.3	43075.0	31581.3	32293.8	36068.8	56156.3	56125.0	58506.3
Agricultural areas (2)	387718.8	351593.8	361512.5	359506.3	349725.0	328287.5	326987.5	332525.0
Urban fabric (3)	54593.8	55156.3	56062.5	57606.3	59100.0	60268.8	61431.3	54450.0
Industrial or commercial units (4)	6143.8	6293.8	6493.8	6787.5	6837.5	6925.0	6975.0	6481.3
Transport areas (5)	2987.5	3006.3	3037.5	2937.5	3125.0	3181.3	3231.3	2950.0
Mineral extraction or dump or construction sites (6)	1387.5	1412.5	1575.0	1131.3	1143.8	1181.3	1250.0	1087.5
Standing forests (7)	148118.8	148118.8	148443.8	148443.8	152343.8	152343.8	152343.8	152343.8
Natural and semi-natural vegetation (8)	1237.5	1237.5	1193.8	1193.8	1193.8	1193.8	1193.8	1193.8
Water courses and bodies (9)	9106.3	9106.3	9100.0	9100.0	9462.5	9462.5	9462.5	9462.5

⁶ Source: EEA 2010: Corine Land Cover data, <http://www.eea.europa.eu/data-and-maps>.

the same period. This scenario accentuates the processes of suburbanization and urban sprawl that may bring about, as a side effect, an expansion of green urban areas. This is a consequence of decreasing urban population densities. The crisis envisaged for the 2020–2025 period might have negative implications for the development of both the city of Warsaw, and the whole region in a long-term perspective. Solution measures necessary to mitigate spatial land use conflicts, in particular those of environmental nature, would require substantial extra budgetary resources and availability of land with suitable properties. The process of development might not be resumed for more than a decade due to the degradation of natural, as well as man-made, including the built-up environment.

The projection based upon the *Spatial containment* scenario shows an increase of the area covered by urban fabric by 14.1 percent over the 1995–2025 period (see: Table 5.2). The green urban areas, as well as the area covered by agricultural uses, would slightly diminish. More importantly, however, spatial concentration – the clustering of cells covered by individual land uses, is seen to increase. This is attributed to one of the modeling assumptions, according to which the outer limits of the WMA are maintained constant over the projection period. Hence, land use development that would otherwise spill over its boundary is contained within the study area. In the respective scenario the spatial growth containment is the effect of policy instruments implemented over the whole WMA territory – of rigid zoning regulations that allow planners to reduce the number of function-

Table 5.2. Simulated area (ha) of land use classes in WMA region 1990–2025 (*Spatial containment* scenario, Metronamica ML)

Land use	1990	1995	2000	2005	2010	2015	2020	2025
Green urban areas (1)	37706.3	43075.0	31581.3	33218.8	37243.8	56637.5	56581.3	56612.5
Agricultural areas (2)	387718.8	351593.8	361512.5	358581.3	348550.0	327806.3	326531.3	324793.8
Urban fabric (3)	54593.8	55156.3	56062.5	57606.3	59100.0	60268.8	61431.3	62956.3
Industrial or commercial units (4)	6143.8	6293.8	6493.8	6787.5	6837.5	6925.0	6975.0	7031.3
Transport areas (5)	2987.5	3006.3	3037.5	2937.5	3125.0	3181.3	3231.3	3306.3
Mineral extraction or dump or construction sites (6)	1387.5	1412.5	1575.0	1131.3	1143.8	1181.3	1250.0	1300.0
Standing forests (7)	148118.8	148118.8	148443.8	148443.8	152343.8	152343.8	152343.8	152343.8
Natural and semi-natural vegetation (8)	1237.5	1237.5	1193.8	1193.8	1193.8	1193.8	1193.8	1193.8
Water courses and bodies (9)	9106.3	9106.3	9100.0	9100.0	9462.5	9462.5	9462.5	9462.5

al land use conflicts, and to control urban sprawl. These measures might restrict the spread of the observed, mosaic patterns of location of various, often conflicting functions, and promote the emergence of well organized spatial structures, shaped in accordance with the earlier installed technical infrastructure. This would generate additional incentives for social and economic development of the WMA.

To conclude, the spatial patterns that are generated within the two simulation runs (see: Figs. 5.3 and 5.4), are in compliance with the alternative scenario assumptions. As anticipated, spatial concentration of urban fabric is considerably higher according to the projection based upon the second scenario. Differences between the two projections are noticeable in the distribution of both residential, as well as industrial and commercial land uses.

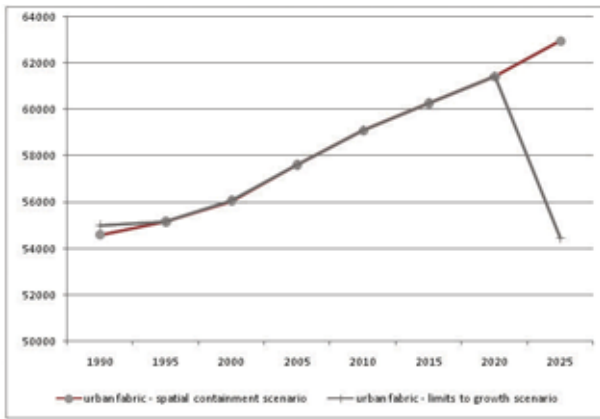


Figure 5.3. Total area of residential urban fabric in WMA, 1990 (Limits to growth vs Spatial containment scenarios), in hectares

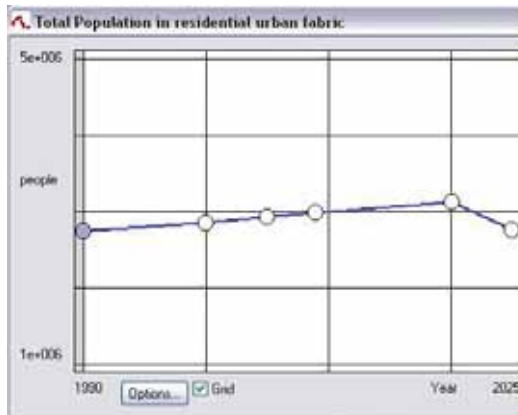


Figure 5.4. Total population of residential urban fabric in WMA 1990–2025 (Limits to growth scenario)

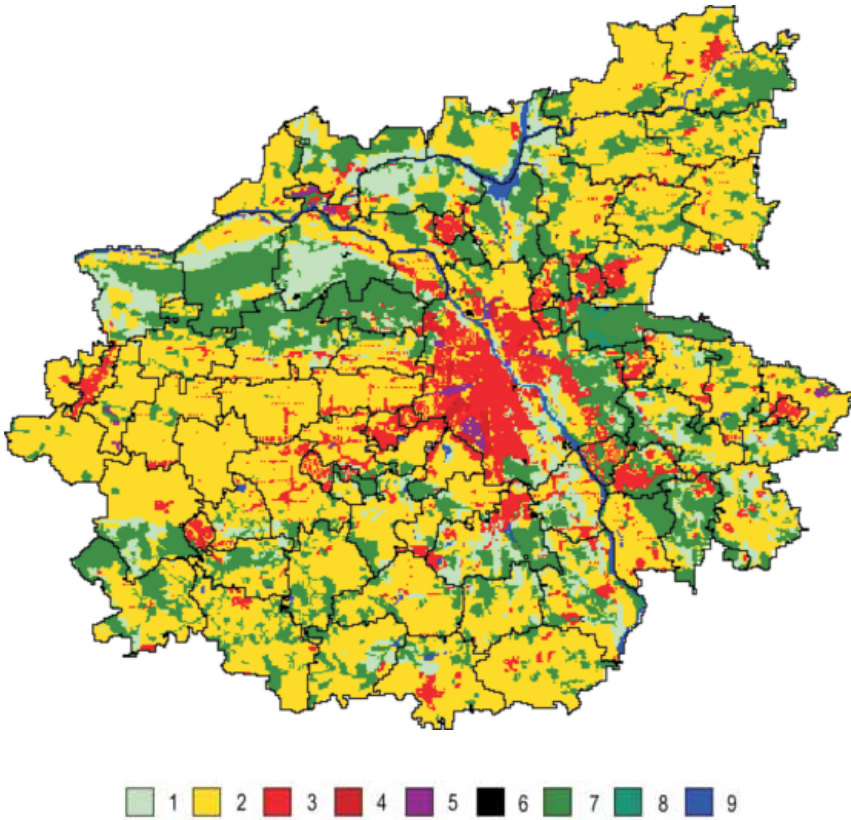


Figure 5.5. Simulated land use in WMA 2025. The categories of land use – see Table 5.1 (*Limits to growth scenario Metronamica ML*)

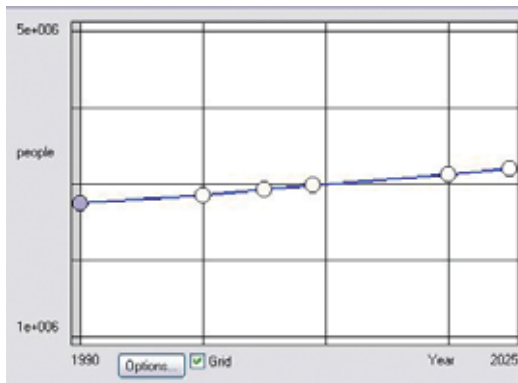


Figure 5.6. Total population of residential urban fabric in WMA, 1990–2025 (*Spatial containment scenario*)

As pointed out earlier, the alternative development scenarios have been constructed with participation of planners and stakeholders from the study area. Hence, the modeling results should contribute to the ongoing spatial policy debate. Both supply of, and demand for land evolves over time, reflecting changing needs and expectations of inhabitants and of external investors. It is indicated in the *Limits to growth* scenario that an extensive and uncontrolled use of space may lead to degradation of its quality, and to handicap the region's development potential. The point suggested in the *Spatial containment* scenario is, that for an effective land use control, coordination of spatial policy on a broader territorial scale, including urban, peri-urban, and rural hinterland areas, represents an important prerequisite.

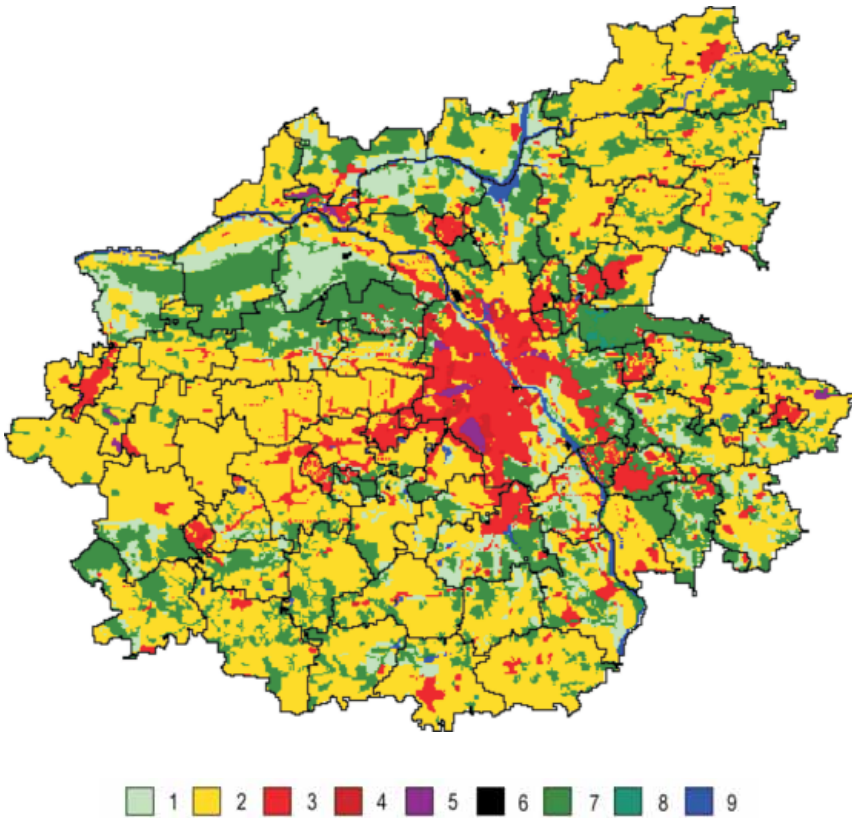


Figure 5.7. Simulated land use in WMA 2025. The categories of land use – see Table 5.2 (*Spatial containment* scenario, Metronamica ML)

5.4. Peri-urban areas in strategies and plans for sustainable territorial development

The results of simulation of land-use changes, as well as the earlier described practice of land use management in the Warsaw Metropolitan Area call for new approaches and instruments to guide the development processes. One element of this new approach is distinction of peri-urban areas as a specific sub-regional category. These areas experience, as presented earlier, the transition from strictly rural to urban character, resulting from high pressure towards urban development. They form unique spatial and functional structures that are different from those found in suburban zones, both in terms of intensity of land use and the functions performed. They also represent a new kind of landscape. The peri-urban areas constitute a new challenge for politicians and planners mainly because peri-urbanization is more than a simple invasion of urban type built up environment upon traditional rural areas. The incentives for peri-urban development come from different directions. Some of them are generated by evolution of agricultural sector in urban – rural regions and by its changing importance for local and regional economies. The development of peri-urban areas is not limited to pure physical urban expansion. It is also often marked by the emergence of functions and activities addressed to urban population living in cities located nearby. This is an important statement. It points out the existence of endogenous development resources and development potential in the peri-urban areas. The utilization of these resources and potential might help to create a base for sustainable development of urban – rural regions and impede negative consequences of urban expansion, including urban sprawl.

Urban-rural relationships have two main dimensions: structural and functional. The structural dimension refers to physical structure of land use, settlement pattern, and distribution of population. The functional dimension refers to modes of production, consumption, and exchange. Both the structural and the functional relationships change over time and depend on market driven development processes, as well as on development policies designed and implemented by public authorities. It is important that these policies contribute to preservation of assets, which can not be limited, as it often happens, to land available for development, generally cheaper in peri-urban areas than in other parts of the region. The role of agriculture, and the role of rural areas in development of urban – rural regions should be reexamined. The key question is to what extent the *urban – rural region* should remain *urban* and *rural*? And what does *rural* mean in this case? Urbanity and rurality represent properties important for numerous development policies, questions that go beyond the location of function and production modes. These questions are more about the nature of linkages between urban and rural areas, and about development opportunities they offer.

Transformation of peri-urban areas is seen as an important factor that has an impact on the future development of the whole urban – rural region. Depend-

ing on specific development policies the peri-urban areas under transformation can become problems or opportunities for local and regional development. Under the *Spatial containment scenario* peri-urban areas will maintain their attractive features and will hence contribute to the attractiveness of the region. Under the *Limits to growth scenario* they will lose such properties contributing to degradation of the whole area. Thus, the systemic responses to peri-urban areas transformation are needed, and should become parts of development policies formulated at local and regional levels.

So far the specificity of peri-urban areas is not commonly recognized in planning procedures and documents. This is partly because of the way the system of spatial planning and territorial development management is structured. A broader, supra-local perspective in planning and management is generally lacking. Additionally, the significance of peri-urban areas for sustainable development is overlooked due to particular economic interests of individual municipalities. Cooperation among municipalities in preparation of development plans is a very rare phenomenon. Spatial planning law does not provide efficient tools to secure multi-functional, integrated development that is needed in these type of areas.

The analysis of territorial governance systems performed under the PLUREL project highlighted the role of effective formal institutions, planning procedures and instruments, and of financial, as well as sectoral policies at the urban – rural regions level, their importance for sustainable development. Informal cooperation among local governments has usually limited impact on spatial development, and hence formalized public control over peri-urban processes is needed. The experience related to the development of Warsaw Metropolitan Area provides arguments showing that in this case a systemic basis, in terms of institutional framework, procedures, and tools, is missing. Formal institutions and planning procedures and instruments are weak and do not provide sufficient control over development processes. Neither the financial, taxation, sectoral policies and regulatory tools, nor governance processes assure such a control. Thus, with the absence of systemic solution, the *Limit to growth* is likely to represent the more realistic out of the two scenarios.

Afterword

There are numerous references to planning and spatial policy issues throughout this volume. This is indeed a major theme in the bulk of contemporary studies on peri-urbanization processes and urban-rural linkages. As it has been documented in PLUREL, peri-urban areas in Europe are growing four times faster than urban areas, and their surface may double within the next 30 to 50 years (Piorr *et al.*, 2011). The way their spatial and functional patterns may evolve is by no means unimportant from the perspective of overall social and economic development.

In this context, it is often claimed that polycentricity comprises the desirable form, one which is in accord with the seemingly contrasting objectives that are included in the territorial cohesion formula. This spatial form, however, may be achieved, and become durable, only when social and economic rationality of policy choices is respected. Since tendencies for various activities to decentralize, or to cluster, are likely to evolve, there is always a risk for spatial policy to respond to the past, and not necessarily to the lasting trends. Here, the utility of prospective, future-oriented studies is coming to the fore, though this in turn requires due respect to be paid to their sound conceptual foundations. As it is generally agreed, in the case of today's urbanization-related research, such an integration of applied and theoretical aspects still represents a major challenge.

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Kształtowanie się regionów miejsko-wiejskich: od perspektywy europejskiej po skalę lokalną

W obszernym zbiorze pojęć i koncepcji badawczych dotyczących zjawisk i procesów urbanizacji pojawiają się wciąż nowe ujęcia. Należą do nich koncepcje regionu miejsko-wiejskiego oraz procesów pery-urbanizacji. Odzwierciedlają one współcześnie zachodzące zmiany relacji pomiędzy obszarami miejskimi i wiejskimi – postępującą integrację osadnictwa pod względem struktur społecznych, krajobrazu kulturowego, jak również pełnionych funkcji.

Wymienione koncepcje były rozwijane w projekcie PLUREL 6 Programu Ramowego UE, realizowanym w okresie od stycznia 2007 do marca 2011 roku, koordynowanym przez prof. K. Nilssona, reprezentującego Wydział Nauk o Życiu Uniwersytetu Kopenhaskiego. Niniejszy tom dokumentuje wybrane prace wykonane w ramach projektu w IGiPZ PAN, uwzględniając szerszy kontekst, w jakim były one prowadzone. Instytut, jako partner projektu, uczestniczył w pracach trzech spośród pięciu jego modułów, przy czym region Warszawy był objęty tzw. studium przykładowym, obok regionów: Lipska, Manchesteru, Hagi, Montpellier oraz Kopru.

W pierwszym rozdziale tomu przedstawiona jest koncepcja regionu miejsko-wiejskiego – jej źródła, treść, interpretacje oraz znaczenie praktyczne. Cztery cechy wprowadzonego podejścia można uznać za specyficzne dla prac projektu (w wielu opracowaniach przyjęty został termin „region wiejsko-miejski”).

Po pierwsze, akcentowane są zmiany użytkowania ziemi, rozwój działalności gospodarczej oraz przemiany ludnościowe w strefach pery-miejskich regionów – na obszarach, które w sensie fizycznym mają w przeważającej części charakter wiejski, natomiast pełnią głównie funkcje zaliczane do miejskich. Wielofunkcyjność oraz wysoka dynamika zmian, to typowe cechy tych obszarów. Pery-urbanizacja nie jest traktowana jako nowy termin określający rozwój stref podmiejskich. Podczas gdy to drugie zjawisko jest efektem rozszerzania się obszarów miejskich, obszary pery-miejskie należy interpretować jako przestrzenie, na których napływ działalności związanych z miastem styka się z urbanizacją *in situ* – gospodarczymi, kulturowymi i fizycznymi przemianami osadnictwa wiejskiego.

Po drugie, w koncepcji regionu miejsko-wiejskiego podkreślana jest rola funkcji określanych jako funkcje (świadczenia) ekosystemów, co uwypukla pozycję zajmowaną w skali regionu przez obszary wiejskiego zaplecza. Funkcje te, odnoszące się do interakcji środowiska przyrodniczego oraz społeczeństwa i gospodarki, nabierają szczególnego znaczenia wraz ze współczesnymi przemianami demograficznymi i kulturowymi, co prowadzi do wzrostu współzależności funkcjonalnej pomiędzy poszczególnymi strefami regionu.

Po trzecie, przyjmuje się, że charakter relacji występujących wewnątrz regionu, jak również ich zmiany, są związane z takimi cechami jak liczba i dynamika ludności, intensywność przestrzennego zagospodarowania oraz morfologia osadnictwa. Określenie związków pomiędzy tymi cechami pozwala na identyfikację odmiennych typów regionów miejsko-wiejskich.

Po czwarte, zgodnie z przyjętym w projekcie podejściem, regiony miejsko-wiejskie stanowią jednostki terytorialne i funkcjonalne dogodne z punktu widzenia możliwości identyfikacji ważnych problemów rozwoju w przestrzeni, a tym samym jednostki odpowiednie do realizacji celów polityki i strategii przestrzennej. Strategie te powinny być dostosowane do poszczególnych typów regionów.

Typologiom regionalnym jest w całości poświęcony II rozdział monografii. Zawiera on szczegółowy przegląd i ocenę typologii europejskich regionów miejskich i miejsko-wiejskich, wykonywanych w ramach międzynarodowych studiów porównawczych już od lat 1970., jak również dwa opracowania typologiczne powstałe w projekcie PLUREL. W studium przeglądowym wyróżniono trzy rodzaje typologii, których kryteria są oparte na: (a) profilu funkcjonalnym regionów i pozycji głównych ośrodków w systemach miast, (b) stopniu urbanizacji i morfologii osadnictwa, (c) powiązaniach funkcjonalnych pomiędzy strefami – obszarami składowymi regionów, w tym migracjach i przejazdach, redystrybucji działalności gospodarczej i związkach instytucjonalnych. Wskazano na deficyt w zakresie typologii trzeciego rodzaju, jak również na niecelowość dążenia do opracowania wielokryteriowych typologii spełniających różne cele poznawcze i praktyczne.

W dalszej części tego rozdziału przedstawione są zasady oraz wyniki typologii regionów opracowanych równolegle, w początkowej fazie realizacji projektu, w IGiPZ PAN oraz w Austriackim Instytucie Badań Systemowych. W pierwszym z tych studiów typologią objęto zbiór Funkcjonalnych Obszarów Miejskich, wyznaczonych w pracach ESPONu, liczących ponad 400 tysięcy mieszkańców. Przyjęto jako kryteria przestrzenną strukturę osadnictwa, w nawiązaniu do klasycznych modeli ekologicznych, uwzględniając stopień złożoności układu osadniczego, jak również kierunek zmian ludnościowych – wzrost, spadek, koncentrację, dekoncentrację – w regionie. W analizowanym zbiorze, przy zastosowaniu trójwymiarowego schematu typologicznego, najliczniej były reprezentowane regiony o złożonej strukturze osadnictwa, z przewagą układu sektorowego oraz bezwzględny przyrostem liczby ludności, zarówno w regionie jako całości, jak i w jego strefie wewnętrznej.

Druga z wymienionych typologii objęła zbiór jednostek NUTS-3 w skali UE-27. Były one analizowane pojedynczo, a następnie agregowane w regiony. Kryteria odnosiły się do liczby mieszkańców ośrodków miejskich (jako rdzenie regionów

przyjęto obszary zurbanizowane, co najmniej stutysięczne, wyznaczone na podstawie zdjęć satelitarnych), morfologii osadnictwa (struktury mono- lub policentryczne) i stopnia urbanizacji obszaru. Wyznaczono sześć klas typologicznych, wśród nich, jako odrębną kategorię, regiony wiejskie, zawierające małe miasta, o skali ośrodków lokalnych. Ta typologia została przyjęta jako punkt odniesienia w dalszych fazach prac projektu.

Trzeci rozdział dotyczy współzależności rozwoju społecznego i gospodarczego oraz zmian użytkowania ziemi w regionach. W jego wstępnej części przedstawiono założenia oraz pytania badawcze. W skali europejskiej podstawowym przekrojem terytorialnym były subregiony – NUTS-3. Badanie zmierzało do określenia wspólnych wymiarów przestrzennego zróżnicowania użytkowania ziemi oraz poziomu rozwoju. W tym stadium badania wykorzystano metodę składowych głównych. Stwierdzono występowanie istotnych różnic w rozkładach wartości czynników pomiędzy podzbiórami jednostek zaliczanych do regionów poszczególnych typów. Najsilniejsze zróżnicowanie cechuje regiony wiejskie, co jest zgodne z ogólnym stanem wiedzy na temat przestrzennych dysparytetów rozwojowych w UE, natomiast relatywnie małe – regiony dużych ośrodków miejskich o strukturze monocentrycznej.

Następnie, za pomocą metody regresji, identyfikowano pary wysoko skorelowanych zmiennych. Jako syntetyczną miarę użytkowania ziemi przyjęto, zgodnie z ogólnie stosowaną w projekcie zasadą, udział powierzchni sztucznych (*artificial surfaces*), w tym głównie terenów zurbanizowanych. Zgodnie z oczekiwaniami, wysoki poziom korelacji z tą miarą intensywności zasiedlenia terytorium (lub bardziej ogólnie: przestrzennego zagospodarowania) stwierdzono w przypadku wartości PKB *per capita*. Dla jednostek zaliczanych do najwyższej klasy udziału powierzchni sztucznych wartości te okazały się dwukrotnie wyższe od ich mediany. Stwierdzono także poszerzanie się w okresie 1996–2006 różnic wartości przeciętnej PKB pomiędzy obszarami miejskimi i perymiejskimi a obszarami wiejskimi.

W dalszym etapie analizowano przestrzenne rozkłady wartości wskaźnika potencjału, określonego jako iloraz wartości potencjału GDP oraz potencjału ludnościowego. Rozkłady te wyznaczono dla stanu wyjściowego, tzn. roku 2000, jak również dla lat 2015 oraz 2025, według czterech alternatywnych scenariuszy, zaadaptowanych do celów projektu, wywodzących się z międzynarodowych studiów dotyczących zmian klimatycznych. Uzyskane wyniki są konfrontowane z rozmieszczeniem obszarów miejskich, perymiejskich i wiejskich, wyznaczonym na podstawie równolegle przeprowadzonych projekcji oraz porównywane z przyszłą przestrzenną strukturą osadnictwa w Europie, wyznaczoną także w układzie alternatywnych scenariuszy rozwoju, w ramach prac programu ESPON.

Rozdział ten uzupełniają wyniki porównawczego studium dotyczącego czynników lokalizacyjnych oraz powiązań funkcjonalnych pomiędzy firmami zaliczanymi do kategorii zaawansowanych usług, usytuowanymi w Warszawie oraz w pozostałych częściach regionu (województwa mazowieckiego). Badaniem zostało objętych kilkaset losowo dobranych przedsiębiorstw tej kategorii. Stwierdzono między innymi występowanie równoległych tendencji do przemieszczeń siedzib firm z oraz do Warszawy, jak również formowania się lokalnych

sieci wzajemnie współpracujących jednostek, usytuowanych poza głównym ośrodkiem regionu.

Regionu Warszawy, jako obiektu studium przykładowego projektu PLUREL, dotyczą w całości dwa końcowe rozdziały monografii. Rozdział IV jest poświęcony obszarom podmiejskim i perymiejskim. Zawiera szczegółowe wyniki uzyskane w trakcie badań terenowych, zwłaszcza na podstawie przeprowadzonej metodą bezpośredniego wywiadu ankiety, skierowanej do losowo wybranych mieszkańców trzech gmin w regionie (a ściślej, w jego centralnej części – obszarze metropolitalnym Warszawy) przedstawiających różnorodne cechy tych obszarów. Wybrane gminy to: (1) Błonie, reprezentujące typ intensywnie zagospodarowanego obszaru z ukształtowanym lokalnym ośrodkiem miejskim; (2) Halinów, gmina położona w strefie objętej nasilającymi się zjawiskami suburbanizacji – napływem nowych mieszkańców i rozwojem osadnictwa, nakładającego się na lokalne osadnictwo wiejskie oraz (3) Leoncin, gmina obejmująca tereny rolnicze i leśne (w tym Kampinoskiego Parku Narodowego), charakteryzująca się stosunkowo niewielką presją procesów urbanizacji.

Badaniem objęto między innymi zagadnienia oceny warunków życia i pracy w danych obszarach, ich relacji z Warszawą, identyfikacji głównych cech obszarów perymiejskich, oczekiwań i postulatów związanych z przyszłym rozwojem oraz z polityką rozwoju. Ukazana jest specyfika poszczególnych typów obszarów.

Wyniki omawianych badań wskazują, że zasady zrównoważonego rozwoju oraz współpracy, zawarte w strategicznych dokumentach opracowywanych na poziomie regionalnym, znajdują słabe odzwierciedlenie zarówno w konkretnych, lokalnych planach i decyzjach lokalizacyjnych, jak również w opiniach mieszkańców. Różnice pomiędzy gminami objętymi badaniem są pod tym względem nieznaczne.

Rozdział V zawiera wyniki projekcji przyszłych zmian użytkowania ziemi w regionie do 2025 roku, na tle trendów rozwojowych występujących w ostatnich dziesięcioleciach. Projekcje te zostały wyznaczone przy zastosowaniu symulacyjnego modelu MOLAND, należącego do klasy modeli automatów komórkowych. Wprowadzone są dwa scenariusze stanowiące alternatywne zbiory założeń. Przy formułowaniu założeń autorzy uwzględnili opinie przedstawicieli środowiska planistów przestrzennych oraz interesariuszy reprezentujących organizacje pozarządowe, wyrażone w trakcie zorganizowanego w tym celu seminarium.

W pierwszym scenariuszu, określonym jako *Granice wzrostu*, uwarunkowania zewnętrzne to rozwój gospodarczy oparty na postępie technologicznym i organizacyjnym, sprzyjający różnicowaniu i specjalizacji funkcji w regionie oraz dalszemu napływowi migrantów. W zakresie polityki przestrzennej występuje kontynuacja dotychczasowych trendów, w tym niedostatek koordynacji planów i działań na poziomie lokalnym i regionalnym, oraz nienadążanie inwestycji infrastrukturalnych za rosnącym popytem. Implikuje to dalszą niekontrolowaną suburbanizację, nasilenie konfliktów w użytkowaniu terenów i degradację walorów przyrodniczych. Następstwem jest obniżanie się jakości życia w obszarze metropolitalnym jako całości, co prowadzi do osłabienia konkurencyjnej pozycji Warszawy i jej regionu w skali krajowej i europejskiej oraz załamania trajektorii rozwojowej około roku 2020.

Drugi scenariusz: *Przestrzennej integracji*, wprowadza podobne jak w pierwszym korzystne założenia dotyczące rozwoju gospodarczego, uwzględnia jednak zmiany umożliwiające prowadzenie proaktywnej polityki przestrzennej, przyjmującej zasady racjonalnego gospodarowania zasobami, ładu przestrzennego, ochrony obszarów o wysokich walorach przyrodniczych zgodnej z koncepcją „zielonego pierścienia” i rozwoju zintegrowanych systemów transportu publicznego. Efektem tych trendów i działań jest poprawa warunków życia i pracy w regionie, a w wymiarze przestrzennym – kształtowanie się sieci wzajemnie powiązanych lokalnych ośrodków – skupisk zaawansowanych funkcji gospodarczych i usług publicznych w skali obszaru metropolitalnego.

Projekcje zmian użytkowania ziemi w obszarze metropolitalnym, oparte na przytoczonych alternatywnych założeniach rozwojowych, różnią się dość istotnie. Pierwszy scenariusz generuje wzrost liczby miejsc pracy i budownictwa w granicach Warszawy oraz wzdłuż prowadzących do miasta pasm infrastruktury technicznej, przy utrzymywaniu się na pozostałych obszarach przewagi rozproszonych układów osadnictwa, ciążących do stref atrakcyjnych pod względem przyrodniczym. W przypadku drugiego scenariusza rozwój osadnictwa przyjmuje układ relatywnie zdecentralizowany, a jednocześnie wykazuje wyższy stopień zwartości mierzonej skupieniem na poziomie lokalnym. Ograniczony jest przy tym przestrzenny zasięg nowego osadnictwa w granicach obszaru metropolitalnego.

W uwagach końcowych akcentowane jest znaczenie, jakie w przestrzennej organizacji osadnictwa ma współcześnie zrównoważony rozwój obszarów perymiejskich. Wskazuje się również na użyteczność badań symulacyjnych, opartych na scenariuszowych założeniach, w analizie i ocenie efektów alternatywnych ujęć w zakresie polityki przestrzennej.

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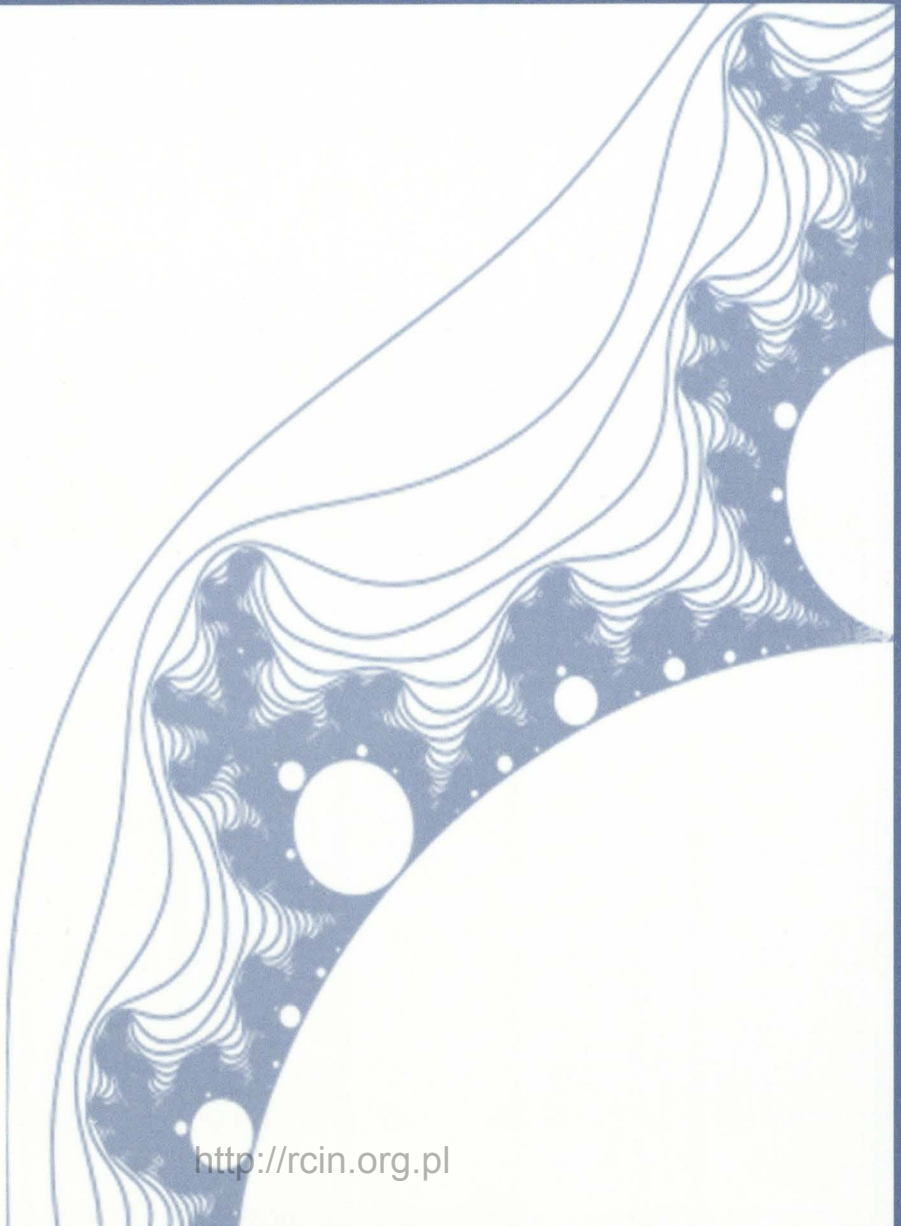
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This volume stems from research work conducted in PLUREL – a 6th Framework project on: Peri-urban land use relationships. It refers to the concept of urban – rural region which focuses on the development of peri-urban areas and on factors of intra-regional interdependence. While following this approach, generalizations that pertain to the European scale are here supplemented with, and illustrated by selected findings concerning the region of Warsaw – one of PLUREL's case study regions.



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