PLUREL

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in Rural-Urban Regions

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Review of Typologies of European Rural-Urban Regions

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Abstract

Typologies of European urban – rural regions have the tradition that goes back to the 1970s. They have emerged 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 regions, were defined so as to include cities together with the surrounding suburban and rural zones, interconnected by intense commuter flows. The concept of functional urban region, or functional urban area, has been widely adopted in subsequent research on urbanization and rural – urban interaction in Europe.

Objectives/aims

The aim of this report is to present the state-of-the art of typologies of European rural-urban regions.

Methodology

This is done by carrying out a literature review and an evaluation of existing typologies of rural-urban regions.

Findings

An important phase in the development of typologies of urban – rural regions is associated with the elaboration of the European Spatial Development Perspective (1999), which identifies the urban – rural partnership as one of the main objectives for European spatial policy. In the following ESPON programme, typologies of urban – rural regions have been generated by several projects, included those on polycentricity, urban functions, and urban – rural relations.

Patterns of urban sprawl, and its impact upon rural areas have also been analysed, and presented in generalized forms, in EU 5th Framework Research Projects: SCATTER and URBAN-PANDENS.

Conclusions

It is identified that the existing typologies of rural – urban regions can be divided into three categories, based on different criteria that refer to alternative concepts of the region and of urban – rural relations. The first category is represented by studies in which the hierarchical structure of rural – urban regions is exposed, as determined by the functional profile as well as the range of functions performed, the population potential, and political and administrative status of the main urban centre. The second category comprises typologies based on criteria related to urbanization level, i.e. the degree of urban vs. rural character of a given area. These typologies tend also to include criteria related to spatial forms – the morphology of settlement, as well as the density and redistribution of population. Typological studies in the third category focus on interdependence of, and interaction between the urban, periurban, and rural zones of rural – urban regions. Studies of the latter kind are rather rare, owing to their heavy data requirements, in particular with respect to flow data.

Classification of results / outputs:
For the purpose of integrating the results of this deliverable into the PLUREL Explorer dissemination platform as fact sheets and associated documentation please classify the results in relation to spatial scale; DPSIR framework; land use issues; output indicators and knowledge type.

Spatial scale for results: Regional, national, European	European
DPSIR framework: Driver, Pressure, State, Impact, Response	State
Land use issues covered: Housing, Traffic, Agriculture, Natural area, Water, Tourism/recreation	No specific
Scenario sensitivity: Are the products/outputs sensitive to Module 1 scenarios?	No
Output indicators: Socio-economic & environmental external constraints; Land Use structure; RUR Metabolism; ECO-system integrity; Ecosystem Services; Socio-economic assessment Criteria; Decisions	Land Use structure
Knowledge type: Narrative storylines; Response functions; GIS-based maps; Tables or charts; Handbooks	Narrative story lines; charts

How many fact sheets will be derived from this deliverable:	**1**

Introduction

Typologies of European urban – rural regions have the tradition that goes back to the 1970s. They have emerged 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 regions, were defined so as to include cities together with the surrounding suburban and rural zones, interconnected by intense commuter flows. The concept of functional urban region, or functional urban area, has been widely adopted in subsequent research on urbanization and rural – urban interaction in Europe.

Objectives of the deliverable
To present the state-of-the art of typologies of European rural-urban regions.

Structure of the deliverable
The report is divided into six chapters describing typologies of European rural-urban regions. The chapters cover the basic concepts, the early typologies, the European Spatial Development Perspective, the European Spatial Planning Observation Network programme, as well as other selected projects related to typologies of urban-rural regions. The final chapter discusses prospects for elaboration of a generic typology of rural-urban regions.

Urban and rural-urban regions: basic concepts

A review and assessment of regional typologies has to be preceded by a reflection on the underling concepts of the region. It is namely important to position the particular notions, as mirrored by individual typologies, within the spectrum of regional concepts, with their mutually overlapping definitions.

The *region* – originally a natural science concept, coexisted until the middle of 20th century with the notion of *landscape* (*Lanschaft*). Its earlier interpretation in terms of an objective entity was challenged by Alfred Hettner (1927) and Richard Hartshorne (1939). A distinction between natural (formal) and functional regions, introduced by the latter author, was elaborated by Darwent Whittlesey (1954) who proposed an alternative dyohotomy – between uniform and nodal regions. While the former are homogeneous, the nodal regions display an internally differentiated structure consisting of a focus, or foci, and an adjacent area connected with the focus by lines of circulation. Similarly, Robert Dickinson (1947) who identified functional regions with city regions, listed focality, interconnection and spatial discontinuity among their main attributes.

One of characteristic features of clusters of regions, and of groupings of functional regions (city regions) in particular, is their prevailing hierarchical pattern. Hence, Walter Christaller's (1933) model of central places, with the surrounding market areas, represents a hierarchical system of functional (city) regions. The hierarchy is depicted here in its strict sense, as centers of a given rank, in addition to their specific functions, also perform all the functions of the lower-order centres. Since they are typically composed of both urbanized and nonurbanized territory, the functional (city) regions, including Christaller's market areas, may be interpreted as *urban-rural regions.* Conversely, the classical model of agricultural land use, by Heinrich von Thünen (1826) is a prototype of the *rural-urban* region, with its urban component represented by the centrally located market place.

Similar conclusions apply to a number of specific concepts of urban and metropolitan regions that have developed 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 pointlike representation of urban areas, the inability to interprete the presence of clusters of urban-industrial centres, the failure to explain the phenomena of suburbanization and periurbanization, including spatial decentralization of tertiary and quaternary functions.

Studies of human settlement patterns have for a long time revealed, in addition to their regular configurations, transitions from one spatial structure to another, following social and economic development. This was the essence of the concept of the metropolitan community formulated by R. D. McKenzie (1933), and based on earlier work by R. Blanchard (1911), N. S. B. Gras (1922) and P. Geddes (1915). It was the latter author who noted that urban growth results not only in economic dominance of smaller towns by metropolitan centres, but also in the physical integration of large urban areas and the formation of conurbations. McKenzie's contribution was to demonstrate the interrelations between the growth of a city as an economic organism and its territorial expansion and internal rearrangement of functions, leading to the state in which a metropolis becomes identified with the former hinterland of the principal urban centre, while the population occupying the whole territory becomes functionally integrated to from one metropolitan community.

The rapid development of transportation during the 20th century and the resulting increase in spatial mobility of people, followed by the growing mobility of institutions were seen as the principal factors of metropolitan development. Successive waves of suburbanization and exurbanization have generated further intensification and expansion of the spatial range of interactions on an ever larger scale of *urban fields* (J. Friedmann and J. Miller, 1965), or *daily urban systems*. (B. J. L. Berry, 1973). These assumptions have found an echo in M. Castells (2000) contemporary concept of the urban region as a "flow-place". Ealier, the sequence of phases of population concentration and deconcentration in cores and peripheral zones of urban regions, were interpreted by L. von den Berg et. al.

(1982) and by P. Hall and P. Hay (1980) in terms of the concept of stages of urban development.

An extention of the idea of metropolitan community onto a national scale led to the hypothesis of metropolitan dominance and to the concept of *metropolitan region* (D. J. Bogue, 1959); O. D. Duncan et al., 1960). It has been namely hypothesized that metropolitan centres tend to increasingly dominate the social and economic organization of technologically advanced societies. As a consequence of this, national territories can in an exhaustive way be divided into sets of metropolitan regions, while the description of national space economies may be based upon an analysis of interdependence among the major metropolitan areas. Such an approach was found congruent with the more recent theory of national urban systems (L. S. Bourne, J. R. Sinclair and K. Dziewoński, 1984), according to which in all highly urbanized societies inter-metropolitan linkages provide the basic framework for the spatial organization of national territory – both the functioning of the economy and the territorial structure of power.

D. L. Jaquinta and A. W. Drescher (2000) have proposed an extended definition of the periurban component of the urban – rural region, or of the rural-periurban-urban system. They assume that especially in terms of migration, the periurban 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 periurban areas, consisting of the following forms:

- *Village periurban*,
- *Diffuse periurban*,
- *Chain periurban*,
- *In-place periurban*,
- *Absorbed periurban.*

Early typologies of European cities and urban regions

During the 1970s there was a growing interest in international comparative research on cities and urbanization processes. The notion of the European Urban System which at that time was already present in the professional literature (P. Hall and P. Hay, 1980), was initially used as an anticipatory concept, a counterpart to the concept of the American Urban System (B. J. L. Berry, 1973). At that relatively early stage of the European integration there was only limited justification for the study of inter-urban linkages and interaction across national boundaries, and of international hierarchy of cities. Therefore, such studies were rare and of a rather restricted territorial extent (a notable exception was the study by G. Tornquist, 1984, on spatial accessibility patterns). The bulk of research on urban settlement dealt with a regional and, in particular, a national scale.

The study referred to earlier (L. S. Bourne, R. Sinclair and K. Dziewoński, 1984), carried out within the framework of the International Geographical Union, introduced a typology of national settlement systems based on their differentiation along several axes measuring the level of economic development, the role of planning and control, and the overall density of population and land use intensity. Also, historical origins of the systems were taken into account. While settlement systems characterized by high land use intensity were found to display a strong hierarchical component, the systems of sparely inhabited countries tend to be founded upon networks of urban centres situated at brake-in-transportation points. Historical transformations of settlement systems owing to shifts in political power represent another explanation of their present patterns. The existing national systems have emerged either through integration of older, regional and local systems, or owing to disintegration of antecedent systems. In the former case the outcome is pronounced polycentricity and a balanced hierarchical structure; in the latter case a dominance of the main urban centre, i. e. high city primacy tends to be observed.

Two other 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 analysed, among others, within the framework of the concept of stages of urban development (L. van den Berg et al., 1982), ranging from absolute, and then relative centralization (the phases of urbanization), to relative and then absolute decentralization (suburbanization), leading to desurbanization, and, subsequently, to reurbanization. This approach was later extended by H. S. Gayer and T. M. Kontuly (1993) into the concept of differential urbanization, pertaining to interregional and national scale.

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 land. The identification of comparable spatial units of reference was seen as an essential, first stage in the analysis.

Subsequently, a working definition of Functional Urban Regions was formulated and the range of the study extended to cover all the countries with IIASA national member organizations, and also the remaining European countries. The regions were defined as consisting of urban cores, basically corresponding to cities of 50,000 inhabitants and over, and their spatially continguous 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, namely, 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 definition did not yield an exhaustive division of the national territory, the balance was considered to be a 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 restricted to a study of interregional and intraregional population shifts (P. Korcelli, 1982).

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 moved 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 deinustralization 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 positively correlated with poor economic performance, as well as population decline. The successful urban regions have been generally those with strong traditions in the service sector, once it is enhanced by a growth of modern, specialized service activities.

The political and economic changes in Central and Eastern Europe have led to a renewed interest in European wide classifications and typologies of urban regions, as new trade routes have been opened and plans drawn for the extension eastwards of the main European transportation corridors. Hence, some of these classification schemes were 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 8 classes is based on synthetic scores derived from 16 indicators which gave preference to international range of functions.

In another well – known study, a map of European Urban Network (Federal Ministry, 1994) several categories of urban regions are distinguished, including *urban regions of potential European importance* – mainly the capital cities of the countries of Central and Eastern Europe. A different approach was followed by P. Treuner and M. Foucher (1994) in their book: *Towards a New European Space*. The authors identified there basic categories of urban regions, each divided into sub-categories. The latter correspond to a large extent to anticipated stages of the enlargement of the European Union. The study was aimed to provide a point of departure for discussions concerning spatial development targets and a possible allocation of EU structural funds.

The ESDP and related studies

The significance in the European spatial policy debates, as achieved by the notion of *urban - rural partnership*, is due to the European Spatial Development Perspective (ESDP 1999), a document adopted by the Informal Council of Ministers responsible for Spatial Planning. In the ESDP, the urban - rural partnership is considered, under a broader topic of polycentric spatial development and a new urban - rural relationship, among policy aims and options for the EU territory. Specific options, particularly relevant in the context of the PLUREL project, include integrating the countryside surrounding large cities in 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 promotion of company networks between small and medium – sized enterprises in the towns and countryside (ibid, p. 25-26).

While no formal typology of urban – rural regions is provided in the ESDP, a differentiation of the urban – rural relationships is emphasized and identified, among others between high and low population density regions, as well as along a spatial scale dimension; from a regional to 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 within the Study Programme in European Spatial Planning (CGS, 1999).

Its main objective was to identify the major issues of interdependence of urban and rural areas in Europe. The analysis was based on 36 case study regions in 14 EU countries (EU-15 except Austria). The types of regions which were defined a *priori*, include:

- *Metropolitan areas*,
- *Polycentric areas*,
- *Urbanised rural areas*,
- *Deep rural areas*
- *Peripheral areas*.

For regions in each category the analysis concentrated upon six aspects of urban-rural relations, namely: (a) Settlement structure and accessibility of infrastructure, (b) Diversification of the economy, (c) Territorial impacts of structural change in agriculture, (d) Conservation and enhancement of natural heritage, (e) The role of cultural heritage, (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, 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, owing to a lack of 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-size cities,

and in modernization of their economic base. This problem also brings negative effects to the intermediate rural areas. On the positive side is the overall high quality of 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 the population ageing and depopulation trends, with the consequent shrinkage of the local economy, including service provision. Assets of such regions pertain to their role in safeguarding the natural and cultural heritage, and in sustaining the biodiversity at the European scale.

Similar results, representing another contribution to the Study Programme in European Spatial Planning, 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 indicators of rural – urban settlement pattern. These measures included: urbanization rate, rural and urban population densities, average spacing of towns with above 10 thousand inhabitants, an index of inequality in towns' size, 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 following five categories were identified:

- *Regions dominated by a large metropolis*
- *Polycentric regions with high urban and rural population densities*
- *Polycentric regions high urban population densities*
- *Regions characterized by networks of medium – sized and small towns*
- *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.

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):

- *polarised (metropolitan and non-metropolitan),*
- *equipotential (balanced) networks of three levels,*
- *hierarchical networks.*

The authors observe that regions characterized by 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 ESPON Programme

The introduction of the hierarchical system of NUTS units and, subsequently, the establishment of the ESPON (European Spatial Planning Observation Network) programme have opened 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 modes 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.

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

The following general definition of Functional Urban Areas (FUA) was used: "For countries with more than 10 million inhabitants, a FUA is defined as having an urban core of at least 15,000 inhabitants and over 50,000 in total population. For smaller countries, a FUA should have an urban core of at least 15,000 inhabitants and more than 0.5 percent of the national population, as well as having functions of national or regional importance. In total, 1588 FUAs with more than 20,000 inhabitants have been identified in Europe" (ESPON 1.1.1., Final Report, 2004, p. 24).

A Functional Urban Area, as defined by ESPON 1.1.1, consists of core municipality (or, a cluster of municipalities forming an urban agglomeration), and commuting area – typically an aggregation of NUTS-5 units[1]. For most of the 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 (the ESPON space, i.e. 27 EU members plus Norway and Switzerland) do not necessarily reflect variations in the structural characteristies 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 - ranking functions in the domain of transportation, manufacturing, higher education and decision making in both public and private sector. National capitals were all included by definition. The 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. Although these results have often been questioned (for

example – the inclusion of Turku, but not of Thessaloniki or Hannover), 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 the purpose to identify areas characterized by high density of urban settlement, where integration of neighbouring FUAs could generate further concentration of population and economic activity. There were two steps in the analysis. The first step involved delineation of PUSH areas that include all municipalities (normally – NUTS-5 units) in which at least 10 percent of the area can be reached within 45 minutes from a 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, when a smaller centre was sharing 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. Final Report, p. 24).

For each PUSH area the settlement pattern was analysed (on the basis of Corinne Land Cover data) from the point of view of spatial concentration level. Four types of PUSH areas were distinguished (see Figure 1):

- *monocentric,*
- *polycentric,*
- *sprawl,*
- *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.

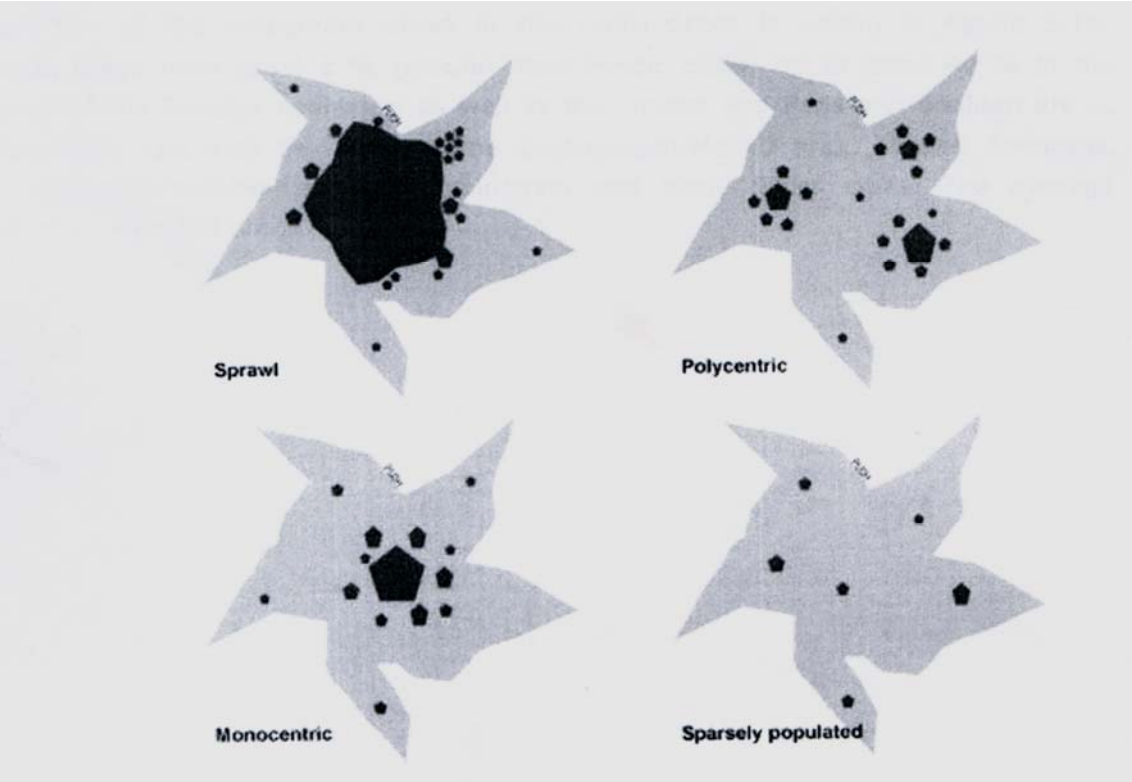

Fig. 1. Different types of settlement morphology
Source: ESPON 1.1.1 (2004), Fig. 5.4, p. 151

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 disputable 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 minutes 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 which offer real attracting power in terms of 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 of *de facto* middle-sized cities have emerged as main cores of huge urban regions, with the total of several million inhabitants. Thirdly, the European patterns of PUSH and PIA areas reflect mainly 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 urban system – the hierarchy and the actual range of influence of urban centers over the 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 the future develop into the so-called Global Integration Zones – potential counterweights to the dominant European core region – the Pentagon. This goal followed from assumptions and postulates formulated in the European Spatial Development Perspective (ESDP, 1999). Hence, spatial structure, with the emphasis an the question of polycentricity, was considered in the project mostly at a national and macroregional, rather than a mesoregional (of an urban - rural region) and local (city) scale (see: Figure 2). Nevertheless, the materials accumulated in the project as well as its results have proven to be 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 in the ESPON 1.4.3 (2007) project on: *The study of urban functions* which attempted to modify and further

develop the concepts and indicators elaborated in the framework of the ESPON 1.1.1 project.

One of these developments[2] concerned internal structure of the Functional Urban Areas. While sustaining the general idea of the FUA as a city (or cities) together with its labour-commuting shed, the ESPON 1.4.3 study has 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 communes, 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 case of FUAs with the same population number, the one having a stronger MUA at its core, especially when characterized by high quality of historical and cultural heritage, has a clear ascendancy. In large, densely populated, highly urbanized regions the rule of spatial continuity of the MUA can not 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 (Figure 3), illustrated by a hypothetical urban cluster situated in a large coal basin area (Type 1), the Ile-de=-France region, with the new towns quite 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).

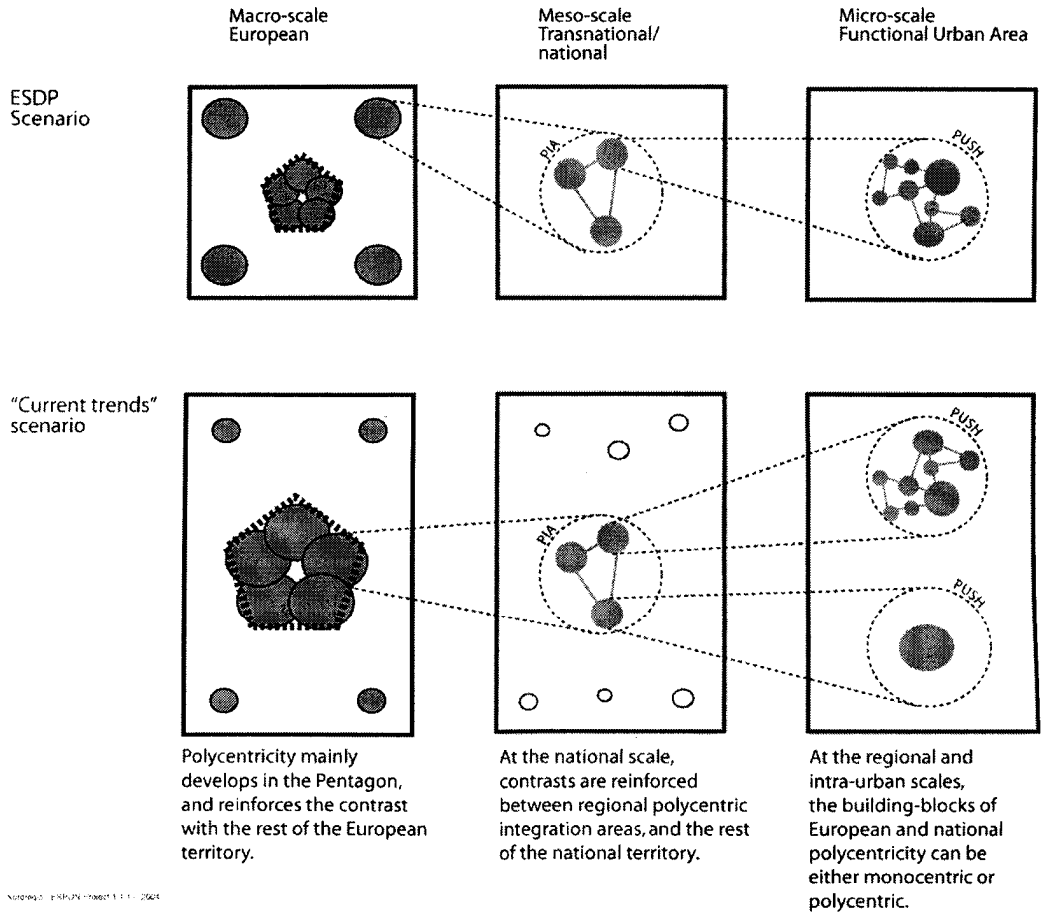

Fig. 2. Scenarios concerning polycentricity development at various spatial scales
Source: ESPON 1.1.1 (2004), Fig. 9.1, p. 240

Still another regional typology, one explicitly pertaining to urban-rural interdependence, has been constructed within the framework of ESPON 1.1.2 project on: *Urban - Rural relations in Europe* (2004). This relationship is registered along two axes that measure the level of urban influence upon rural areas, and the intensity of human intervention. Six types of regions have been identified, in which rural areas are scaled from the ones characterized by high urban influence and high human intervention (typically, though not exclusively the areas around the large cities), to those featuring low urban influence and low level of human intervention (typically – peripheral and mountainous regions). The typology is based on indicators of population density, the ranking of Functional Urban Areas, and land cover data. Individual types of urban- rural regions are characterized by:

- *High urban influence, high human footprint*
- *High urban influence, medium human footprint*
- *High urban influence, low human footprint*
- *Low urban influence, high human footprint*
- *Low urban influence, medium human footprint*
- *Low urban influence, low human footprint*

Other selected projects related to typologies of urban-rural regions

International studies on urban and urban - rural regions involve, as a rule, attempts at the identification of comparable spatial reference units. In the GEMACA project that focused on 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 hectare, and neighbouring municipalities, in which more than 10 percent of the active population commute to work to the core. Types

of urban regions were related to their functional profile (P. Cheshive and G. Gornostaeva, 2002).

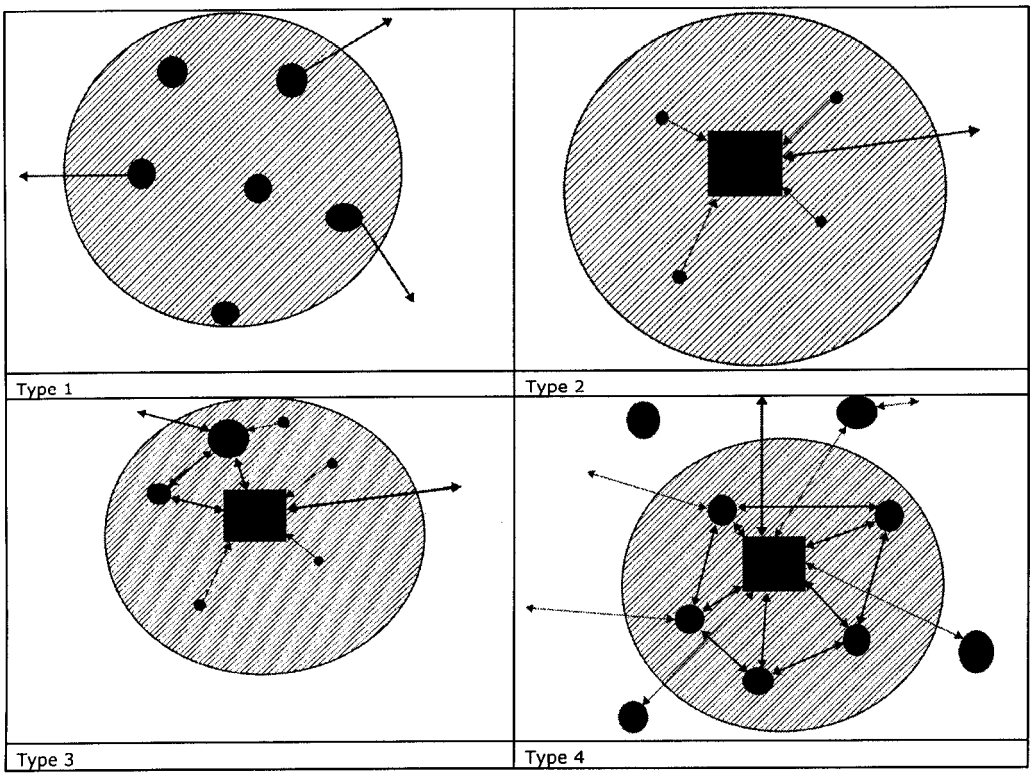

Fig. 3. Four types of spatial structure of large rural – urban regions
ESPON 1.4.3, (2006). The study of urban functions. Draft Final Report, p. 156

Changing functional and spatial relations (business decentralization, service network flows) in urban regions have also been studied in the POLYNET project, in 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, again are defined as Functional Urban Regions (FUR) that are neither administrative nor morphological units (P. Hall, 2004), but have been delineated in the basis of daily commuting flows.

Two major projects of the EU 5th Framework Programme, namely SCATTER (M. Batty, N. Chin and E. Besussi, 2002) and URBS-PANDENS (Ch. Couch, L. Leontidou and G. Petschel-Held, 2007), focussed on urban sprawl, the 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 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 of such generalizations is identification of four types, or profiles of urban sprawl:

- *Sprawl as an emergent polycentric region,*
- *Sprawl as a scattered suburbs,*
- *Sprawl of peripheral fringes,*
- *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 (from 135 in the case of Brussels to 489 in Helsinki region) of territorial units which, in turn were aggregated into three main zones: urban centre, outer urban ring, and the hinterland (G. Haag, J. Binder, 2002)[3].

Towards a generic typology of urban-rural regions

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 - the European Union, with its highly differentiated patterns of human territorial occupancy, and of varying space economy.

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.

Attempts aimed at the identification of 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.[4] 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 enough from the point of view of its specific research goals. In the case of typological studies at least, the existing data gaps, such as nonavailability of commuting-to-work data for a number of countries, is seen as a bigger 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 is some respects that are rather crucial from the perspective of the PLUREL project. One of these differences relates to spatial extent of the region, usually identified with the range of the commuting zone. While it generally includes the suburban (peri-urban) belt, it may, or may not extend into the exurban, i.e. rural settlements from which commuting tends to be less intense. The farthest going in this respect is the concept of *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, where 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, one followed by the US Bureau of Census, is 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, while 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, it has been documented that large urban centres are increasingly involved in global and continental networks of interaction (P. J. Taylor, 2003), at the cost of weakening their ties with the surrounding regions. Here, the role of the PLUREL project in analysing the interdependence between various forms of land use in urban-rural regions, and forecasting their future patterns, can be emphasized.

The existing typologies of urban, and urban - rural regions are based primarily on functional criteria, since the 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 political and administrative functions performed. Among other measures of functional competitiveness, the aggregate spatial accessibility within the given territorial system comes to the foreground.

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 (A. Meitzen, 1895, H. Szulc, 2002), in town planning studies (P. Abercrombie, 1933; K. Dziewoński, 1962), and in urban social ecology (R. E. Park, E. W. Burgess and R. D. McKenzie, 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[5]. The general interdependence between morphology and economic performance of cities and regions has never been proven, but 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, are normally observed.

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 (L. Wirth, 1938; R. E. Pahl, 1965), in which individual settlements (in this case regions) are placed on the scale, from purely rural to totally urban (or large urban), with mixed, or transitional forms in between. Typological criteria applied refer to such variables as density of urban and rural populations, population change, size and distribution (spacing) of towns, 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 urban and rural economy. This points towards a generally neglected dimension of urban and rural typologies, i.e. their prevailing 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 in some earlier studies (L. van den Berg et. al., 1982) classifications based upon patterns of intraregional population redistribution, referring to the concept of stages of urban development, were attempted. One should agree with D. Pumain (1999) again, that for a proper assessment of 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 have to be usually generated within 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 combinations, lead to alternative classes of rural – urban typologies (see: Table 1).

At this point a question should be posed concerning prospects for the development of a comprehensive typology of rural – urban regions. Such a perspective seems unlikely. Individual classes of regional typologies stem from various concepts of urban and rural – urban regions. They also relate to different spatial scale, from transnational and national, to interregional and interregional level, and, as a consequence of this, to different levels and goals of spatial policy.

Table 1. Typologies of urban and rural – urban regions

Underlying concepts	Typological criteria	Classes of typology
City – regions; urban systems	Functional profile, rank in urban and regional systems	Hierarchical structure of Functional Urban Regions (Functional Urban Areas)
Socioecological models of urban spatial structure; Morphological area	Settlement forms: mono-centric, sectoral, polycentric patterns	Metropolitan - urban - rural regions
Rural - urban dichotomy rural - urban continuum	Urbanization level, population density, size structure of settlement	
Stages of urban development	Differential patterns of interregional population redistribution	Patterns of intraregional specialization and inter-dependence
Urban – rural partnership	Functional linkages (flows) between rural, periurban and urban zones	

Source: Author's elaboration

Conclusions

Among the existing typologies of urban-rural regions the following three categories can be distinguished:

(I) Typologies of regions in which the rural, and often also the periurban zones are identified with the commuting shed of the main urban centre (or centres, in 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 urban systems hierarchy at a national and international level. This category of typological studies involving urban-rural regions is most frequently represented in the literature.

(II) Regional typologies based on criteria of urbanization level, i.e. the degree of urban vs. rural character of a given area. The scale adopted extends from metropolitan to rural or deep rural areas. Hence, the regions identified are in a sense homogeneous, as they to not represent the typical structure of an urban - rural region, composed of the urban core, the periurban 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, with the purpose of selecting case study regions, or evaluating the distribution of the case studies that have been identified on a *priori* basis.

(III) Typological studies of rural - urban regions which focus on interdependence of, and interaction between the urban, periurban 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 heavy 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.

NOTES

[1] A more detailed definition of European Functional Urban Areas (EFUA) was developed in the framework of the Study Programme in European Spatial Planning (D. Pumain, 1999).

[2]Work in the ESPON 1.4.3 project also focussed on indicators and the evaluation of polycentricity, the identification of cross-border FUAs, as well as of functional criteria to be used while distinguishing the MEGAs (Metropolitan European Growth Areas), among the total set of FUAs.

[3]In yet another study on *urban sprawl* in Europe, carried out by the European Environmental Agency, Urban Morphological Zones were defined as clusters of built-up areas situated not more than 200 meters apart (EEA, 2006).

[4]Definitions of urban regions as statistical and/or planning units have a longer history. Metropolitan districts were used for the first time in the US Population Census of 1910, and the data on Conurbations were collected by the General Register Office in Great Britain already during the 1930s. At an international scale, comparative statistical data for world's metropolitan areas were published by Kingsley Davis in 1959.

[5]A detailed, comprehensive review of urban spatial patterns, of the relevant terminology and the literature was elaborated by S. Marshall (2005).

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