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EUROPA XXI

12

CENTRAL AND EASTERN EUROPE: CHANGING SPATIAL PATTERNS OF HUMAN ACTIVITY

WARSZAWA 2005

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EDITORIAL

Spatial dimension of social and economic inequalities in Central and Eastern Europe presents today topical political and economic problem. However, it is above all geographical problem by nature. Therefore the subsequent, twelfth volume of the series Europa XXI, draws attention to this sensitive issue. The volume includes 18 articles. The first nine articles which came about as a result of a comparative analysis include a great deal of methodological and theoretical material. The subsequent ones are concerned with the specific areas and concentrate primarily on spatial processes going on within them. Both parts are closely related to each other—there can be indicated a few articles dealing with the same matter. Spatial differentiation of the selected social problems, and to a lesser degree economic, are presented from a national perspective, and in some cases from a regional or even local (within a city or a town). The authors of all the published papers are the leading research workers dealing with the spatial issues who come from Central and Eastern Europe. They are representatives of Polish, Hungarian, Czech, Slovak, German, Bulgarian, Ukrainian and Russian academic centers.

The papers address the problem of developmental polarization. It was found that, central areas, the so-called core areas, were developing much more dynamically than areas located on the peripheries of major urban centers and transportation routes. Also, the position of rural areas with predominantly monocultural type of agricultural economy is unfavourable. Developmental inequalities manifest in numerous social and environmental problems which are common in the whole region discussed. Among these problems are unemployment, deteriorating living conditions, social exclusion, migratory outflow and a lack of funds for environmental projects.

A clear-cut relation: core—periphery, carries serious challenges facing the regional policy. Due to the strengthening position of the metropolises with well-developed infrastructure and largest concentration of well educated and enterprising population, the regions become increasingly competitive in Europe and worldwide. Thus in the process the major urban centers can turn into a motor force behind development for the whole regions. But unfortunately it is an extremely slow development. So far, the period of transformation combined with metropolitanizing observed in Central Europe resulted in growing disparity within particular regions. Transportation infrastructure, communication and education are the key to a successful transfer of this economic boom to peripheries. It is essential that areas surrounding a metropolis were really of crucial importance and formed one functionally cohesive region. Better transport connections facilitate commuting (also from farther distances), which for peripheral regions is more preferable to migration. Since commuters remain the inhabitants of the local centers and thus, staying in the place of living, they contribute significantly to creation of local markets for

services. At the same time, taking advantage of the existing links between periphery and metropolitan areas may occur only in those local communities that have higher level of education. Hence the processes of deglomeration in the higher education taking place in Central Europe can be perceived as positive phenomenon.

Some authors underline unanimously that when formulating the concepts and developmental strategies the issues of regional inequalities described in their articles need to be tackled individually. Given the fact that Central Europe can expect an inflow of structural funds from EU, it becomes particularly significant. The system which makes financial assistance conditional on staying below a specific level of economic development (expressed in mean EU GDP value) is at odds with the concept of individual approach. Among the new EU member states almost all regions from Central Europe meet the necessary conditions for access to structural funds. This is partly due to political efforts consisting in tampering with the borders of administrative units However this situation leads to an excessive dispersal of financial means.

As editors we express hope that a volume presented in the series Europa XXI will contribute to better insight into the complicated spatial relations existing in Central and Eastern Europe and will be helpful in formulating the developmental concepts. We expect that the publication will provide a valuable source of information for all who deal with these issues. At the same time we inform our readers that the twelfth volume is the first launched in new smaller format and with changed editorial lay-out. This involved tremendous effort on the part of the editors of the series (in the persons of Maciej Jakubowski and Barbara Jaworska) and a make-up editor responsible for the new lay-out of the publication (in person of Malgorzata Cala). We would like to express our warmest thanks for all efforts you have put in.

Konrad Ł. Czapiewski
Tomasz Komornicki

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THE GEOGRAPHY AND SUSTAINABLE DEVELOPMENT— A NEW APPROACH

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Key words: geography, 'pure' geography, applied geography, theory of sustainable development, models

THE ORIGIN OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT

The concept of sustainable development has evolved in a conscious way since the turn of decade between the 1960s and 1970s, though it is sometimes traced back to the American environmentalism of the 1920s (Gottlieb 1993) or even to the practice of regenerating forests on the territory of present Germany in the Middle Ages (Weizsäcker et al. 1999).

A stimulus for the evolution of the concept of sustainable development was the successively revealed fact that a further maintenance of the patterns of production and consumption present in high industrialised countries and their adoption by developing countries could lead to a breakdown of the functions sustaining life on Earth. The symptoms of this breakdown, increasing in the second half of the 20th century, are a manifestation of several crises, and the willingness to overcome them was an impulse for the evolution of the concept of sustainable development. Among these crises the most important ones for further discussion are (Baranowski 1998):

- philosophical-ethical (moral) crisis—domination of 'have' over 'be' in people's behaviour;
- crisis of science—depletion of the possibilities of the reductionist model of science, together with a lack of ability to develop holistic approaches;
- social crisis—in which macroeconomic criteria dominate over an individualistic approach;
- crisis of technosphere—manifested in standardisation, specialisation, synchronisation, maximisation and centralisation—occurring mainly in the sphere of production;
- crisis of the concept of spatial management—manifested either in excessive centralisation or dispersion of spatial structures with a shortage of sustainable solutions;

• ecological crisis (of environment quality)—exhaustion of environmental resources and values.

The assumptions of the concept of sustainable development, variously defined, can be summarised in the statement that any development may be sustainable only when it takes into consideration ecological criteria, leading to the maintenance of a material and social base for the development of future generations. This statement expresses the intergenarational principle, which accompanied by interespecifical and interdisciplinarity principles, is one of the basic principles of the implementation of sustainable development. The search for achieving sustainable development is often understood as the harmonisation of four orders: ecological, social, economic and spatial binding them all (Kołodziejski 1997).

RELATIONSHIPS BETWEEN GEOGRAPHY AND THE CONCEPT OF SUSTAINABLE DEVELOPMENT

What can prevent the deepening of the above enumerated crisis phenomena is, among others, a change in the approach to scientific research. Attempts at such a change have been taking place for almost 40 years. The two basic systems functioning on Earth: natural and anthropogenic, have been for a long time the subject of research of two basic groups of sciences: natural and social. Within geography they are dealt with by physical and human geography respectively. The relationships between these two subsystems are studied according to the needs, goal and willingness by representatives of one or the other geographical discipline. This results in the fact that the central subject of research is either nature or anthroposphere, and only in rare cases, the subject covers the relationships between these two spheres. Hence, the key problem seems to be the way to obtain such a method of research in which the two subsystems of the Earth environment, would be treated equally, just as the study of the relationships between their individual elements.

Attempts at such research have been undertaken, more or less successfully, by representatives of a seemingly new discipline, called the study of environment. Despite the fact that in one of the newest academic course books on this subject (Miller 2002), among the disciplines on which the study of environment is based, geography is not mentioned, though the following are enumerated: ecology, biology, chemistry, geology, economy, political science and philosophy, on the basis of an analysis of the content of the course book there can be drawn the conclusion that in majority it overlaps with the scope of study undertaken traditionally by physical and social geographers. Thus, in fact it is a course book on geography with a more holistic approach than applied so far, in which emphasis is placed mainly on the relationships between nature and anthroposphere. Thus, a thesis can be proposed that what has been recently fashionably called the study of environment is in fact geography, in which the subject of research are the relationships between the biophysical and anthropogenic components of the environment (Figure 1).

If this thesis is deemed true, the consequence of the statement that the aim of the study of environment is studying the conditions and processes of sustainable development of the natural and anthropogenic sphere, will be the assumption that it is geography that

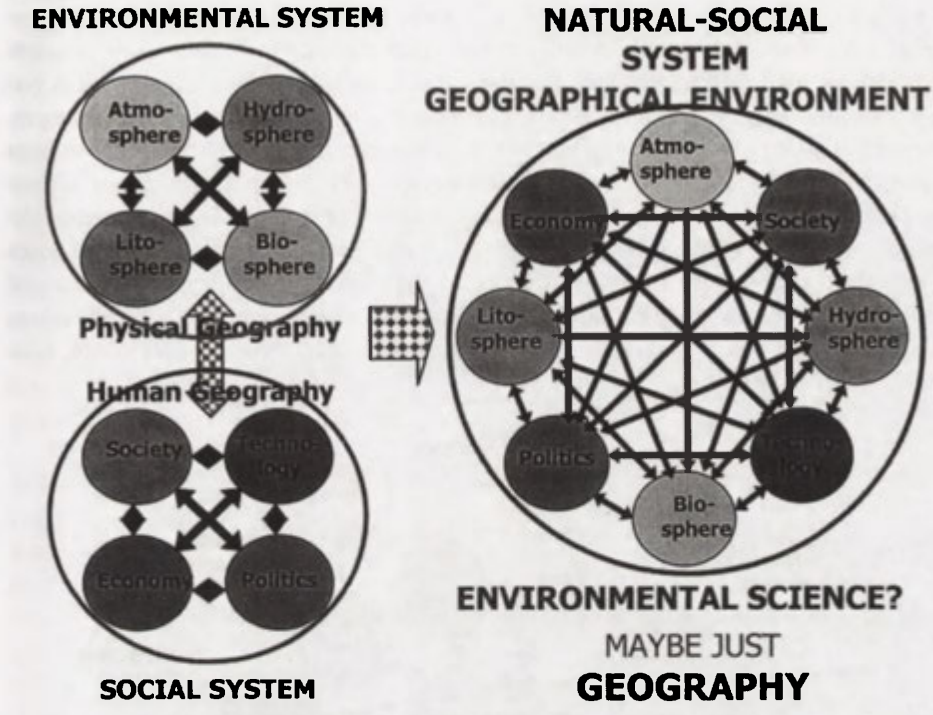


Figure 1. The traditional and holistic approach to geographical studies (Miller 2002)

can investigate the development processes most fully, determining the principles of their sustenance. Here are several arguments to support the thesis:

- firstly, development is a process occurring in space and only a spatial approach to it, most comprehensively studied by geographers, offers proper conclusions about development disproportions and the directions of matter, energy, information and capital flow, which may diminish the disproportions;
- secondly, the concept of sustainable development approaches the course of development processes in a close relationship between the anthroposphere and natural sphere, and geography is a discipline traditionally seeking to study the interactions between these spheres;
- thirdly, the theory of sustainable development serves the formation of scenarios or forecasting the further course of development processes, and geography has been for decades the leading discipline in forecasting, both natural as well as socio-economic processes.

Thus, a question may be asked: if the relationships between geography and research on the sustainable development are so strong, why our science cannot fully cope with the challenge related to the holistic research on development processes? The answer to the

question should be seen, among others, in the history of the development of geography as a science in the last two centuries. Already in the 19th century geography lost its central position in the system of knowledge, where Kant placed it in its division of sciences (Wilczyński 1996), getting divided into physical, human and regional geography. It has systematically lost its significance as a link between the humanities and natural sciences. The specialisation processes continued in the 20th century, leading to the establishment of numerous subdisciplines and research trends (Figure 2). The specialisation of science itself is not a negative phenomenon, yet if a vast majority of its representatives undertake research on very narrow problems (branch or components ones), science almost loses touch with the problems of complex studies. In the case of geography, there occurred such situations that researchers performing investigations in the contact zone of various disciplines, e.g. physical geography and ecology or social geography and sociology, were seen as 'renegades'.

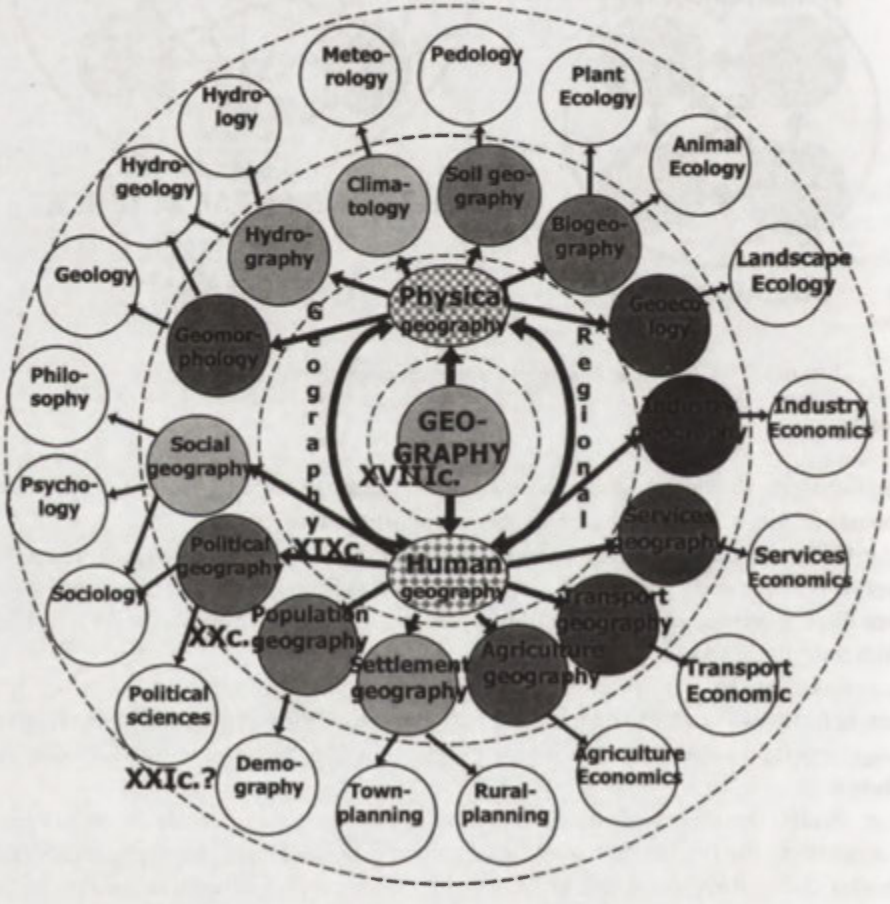


Figure 2. The process of specialization and potential dispersion of geographical sciences into non-geographical science disciplines (Kistowski 2003)

GEOGRAPHICAL STUDIES ON SUSTAINABLE DEVELOPMENT

What is sometimes called the crisis of the 20th century geography is related to some degree to the temporal variability of the gravity centre of research shifting between pure research and applied research. The studies on sustainable development may have the character of basic research as well as applied research. What decides on their usability is the level of the holistic approach to man's environment. As Frazier (1982) mentioned, 'applied geography uses the principles & methods of pure geography but is different in that it analyses and evaluates real-world action and planning and seeks to implement and manipulate environmental and spatial realities. In the process, it contributes to, as well as utilizes, general geography through the revelation of new relationships'. In the case of studies on sustainable development, both kinds of research are usually used in the processes of programming development. In this sense they are closer to the applied approaches than to theoretical ones.

In the 20th century Pacione (1999) distinguished two main periods of applied and pure research with the latter lasting slightly longer than the former (Figure 3). From the point of view of the future of geographical research on sustainable development, the basic question is which research approach will dominate in geography in the decades to come. It would be desirable to search for balance between the theoretical and applied approach.

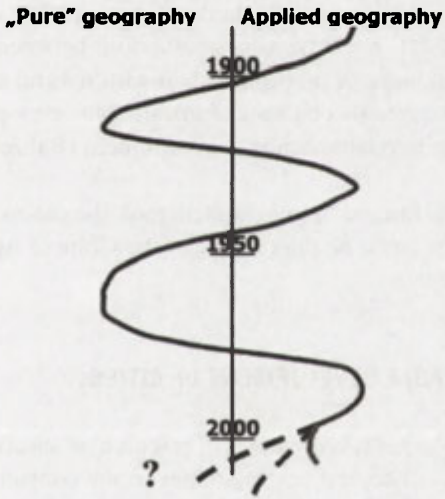


Figure 3. Cycles of pure & applied geography in 20th century (Pacione 1999)

Geographical studies on the conditions of sustainable development, though did not obtain full theoretical and holistic basis, have been developed from the mid 20th century. Still they are performed separately by physical geographers and human geographers. Among the first, from the 1980s, there occurred a rapid development of research on the sustenance of the functions of the natural environment of the Earth. It was stimulated by the observed and forecast changes in the natural environment, especially global climatic

changes. This trend covers global research on the possibilities of water supply, its quality, effects of deforestation and desertification and abandonment of arable land or black fields related to it, reconstruction of degraded areas and protection of swamps. The basis for such research was prepared already from the 1960s when studies began on the matter and energy flow in landscapes under the influence of man: municipal and rural. They had the character of basic research and up to recent time were rarely used to formulate generalisations and conclusions useful for the implementation of sustainable development. Another trend relatively close to the concept of sustainable development is the trend of geoecological studies, especially in the scope of the evaluation of the environmental resistance to the anthropogenic pressure. In the last decade the works of many geographers from this scope entered the path of practical applications, consisting in the development of models and programs of sustainable development of various areas, or in the preparation of guides for constructing such programs.

Due to its anthropocentric character, the concept of sustainable development quite early started to penetrate into social geography. It already had traditions of a holistic approach to problems, joining the processes occurring in the social system with natural conditions, originating from the concept of a dialog of civilisation with nature, formulated at the beginning of the 20th century by Vidal de La Blache. Studies of social and economic phenomena and processes, such as housing conditions, poverty, crime, migration within city, morbidity, social segregation and discrimination, paved the way for undertaking deeper research on socio-economic sustainable development. One of the trends of this research concerned 'ecological conflicts', as contradictions between various ways of socio-economic development, more or less concordant with natural conditions. It was also on geographical basis that general concepts of sustainable development occurred, such as the ecoregional strategy in relations man—environment (Bahrenberg and Dutkowski 1992).

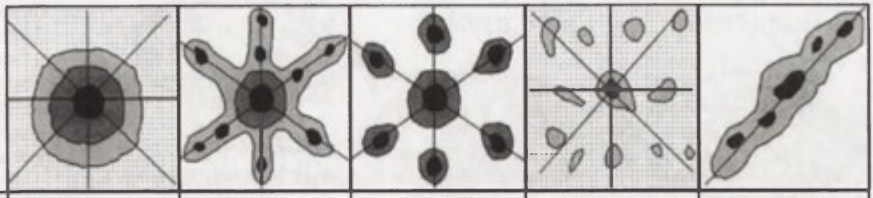
Studies on sustainable development performed by geographers took the character of hermeneutic studies too. The best example could be the critique of the Chinese Agenda 21 carried out by Bradbury and Kirkby (1996).

EXAMPLES OF RESEARCH ON SUSTAINABLE DEVELOPMENT OF CITIES

The limited size of this article allows to present two examples of research on sustainable development. Both of them concern cities. The first covers studies in the contact zone of geography of settlement and town planning, and has a more theoretical character (Kamieniecki ed. 2002). By analysing five basic layouts of the spatial structure of towns (concentric, radial, satellite, dispersed and linear) it was evaluated which model is most favourable for sustainable development of towns. For the purposes of the evaluation the following criteria were adopted:

I. accessibility of the centre;
II. costs of technical infrastructure and transport;
III. accessibility of recreational areas;
IV. possibility of shaping spatial order.

The analysis showed that most favourable is the radial model, and least favourable—dispersed (Figure 4).



Criteria	CONCENTRIC	RADIAL	SATELLITE	DISPERSED	LINEAR
I	+	+	+	-	-
II	+	+	-	-	+
III	-	+	+	+	+
IV	+	+	+	-	+

Figure 4. The evaluation of spatial structure sustainability of large cities (Kamieniecki 2002)

The second example concerns the functioning of a city in the aspect of matter-energy flows. One of the models of these flows, called the 'metabolism' of human settlements was prepared by Newman (1999). It covers four main phases of the 'metabolism':

- resource inputs;
- dynamics of urban societies;
- capability of towns to meet living needs of inhabitants;
- 'waste' outputs (pollution).

In each of the phases there were distinguished several elements and processes. It is worth noting that the structure of most of them is the subject of geographical studies. The resource inputs are usually dealt with by physical geographers, the following two phases are studied by economic and social geographers, and the 'waste' outputs by specialists in environment protection, who often also come from the group of physical geographers (Figure 5).

The model was applied to Sydney, and its components for 1990 and 1970 were compared (Table 1).

Limiting the presentation to resource inputs and 'waste' outputs, their size was recorded to grow significantly in this 20-year period, both in absolute figures and per capita, except for the supplied food (Figure 6). It was assumed that the diagnosis of unsustainable development of the city is a signal for urgent changes in its functioning, especially in the context of new investments connected with the Olympic Games held in Sydney in 2000. It was held under the 'green' banner and the tender for the design of the Olympic village was won by Greenpeace.

The design assumptions included:

- 100% of electric and heat energy will come from renewable resources;
- 80% of transport will be performed by non-motorised means;
- traffic will decrease by 20% by 2005 and by 40% by 2015;

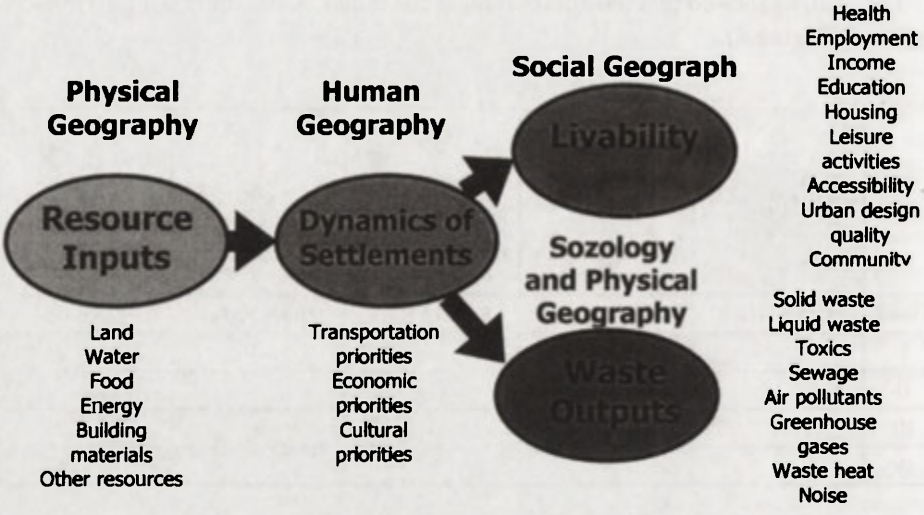


Figure 5. Extended metabolism model of human settlements (Newman 1999) and the role of geography in studying this model

- 100% of solid waste will be recovered;
- the quantity of waste will decrease by 20% by 2005 and by 40% by 2015;
- the use of wood of species occurring in the equatorial forests will be given up;
- sewage will be used to irrigate arable fields and to produce energy.

It was decided to apply the goals successively to the whole city. At this stage the implementation of the principles of sustainable development will depend on town planners and architects.

Table 1. Trends in certain per capita material flows in Sydney, 1970 and 1990 (Newman 1999)

ELEMENTS	1970	1990	1990/1970
Population (thous. persons)	2790	3656	1.32
Energy (thous.MJ/capita)	88.6	114.2	1.29
Food (thous.MJ/capita)	0.23	0.22	0.96
Water (thous.MJ/capita)	144	180	1.25
Solid waste (tonnes/capita)	0.59	0.77	1.31
Sewage (tonnes/capita)	108	128	1.19
Air waste (tonnes/capita)	7.6	9.3	1.22

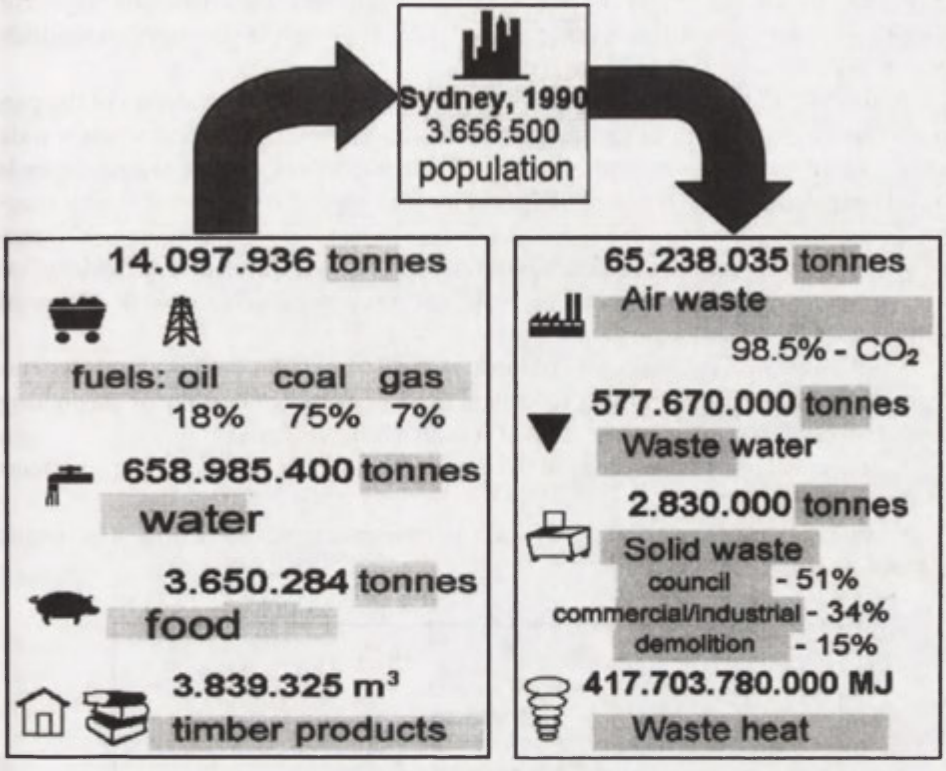


Figure 6. Resources inputs consumed and waste outputs discharged from Sydney in 1990 (Newman 1999)

PROSPECTS FOR THE PARTICIPATION OF GEOGRAPHERS IN RESEARCH ON SUSTAINABLE DEVELOPMENT

The presented examples show that geography can be a discipline if not leading then integrating the range of directions of research on sustainable development. The above indicated potential risks for geography in the form of excessive integration with non-geographical disciplines, may paradoxically become its advantage, if it does not merge with them but gather them around its abilities to approach space and environment holistically. When emphasising the special role of applied geographical research in this process, the traditional involvement of geographers in procedures of ecological-landscape planning (physical geography), social-economic planning (social and economic geography) and spatial (physical) planning should also be highlighted. Planning and programming of sustainable development covers all the three mentioned types of planning.

The participation of geography in the research on sustainable development may become a factor not only of its external integration with non-geographical sciences but also

an impulse for internal integration of geographical disciplines. The integration may occur directly or by co-operation with other sciences related to each of geographical subdisciplines (Figure 7).

In the light of the above discussion it may be assumed that the direction of the participation of geographers in the studies on sustainable development can cover a wide range of problems, and the actual contribution of geographers to these studies depends on our own activity, adopted philosophy and methodology of research and ability to apply a complex approach to processes occurring in the man—nature relationships. It may be assumed that in the nearest decade, due to a relatively well developed methodological background and practical demand, geographical research on sustainable development will focus on the following problems:

- optimisation of the structure and functioning of natural and anthropogenic systems from the point of view minimising redundant flows of matter and energy or maximising flows favourable for achieving the goals of sustainable development;
- determination of the capacity of the natural environment for matter-energy effects of anthropopressure;
- evaluation of effects of burdening the environment by the functioning of economic system and social consumption;

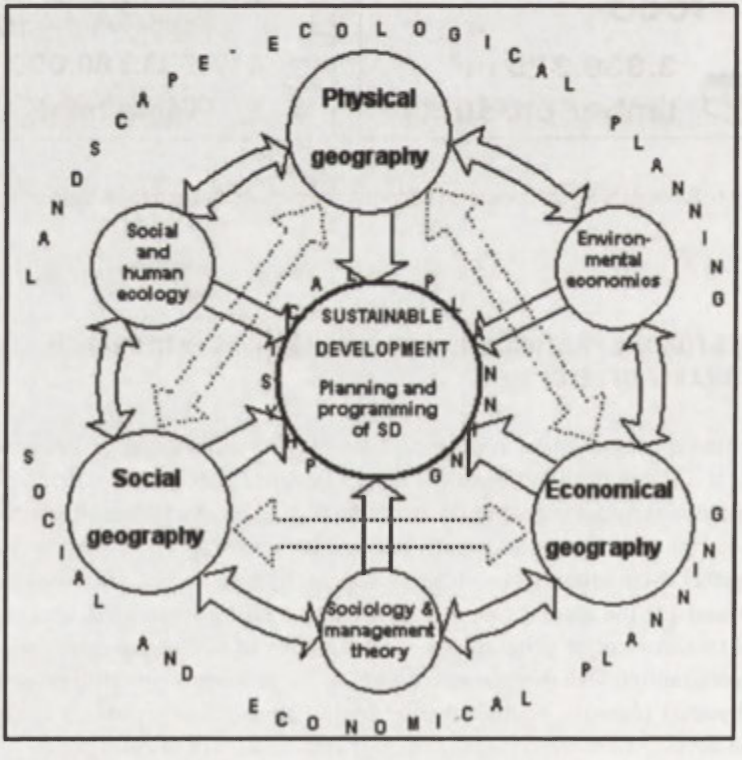


Figure 7. Sustainable development studies as the integration factor for geographical sciences (Kistowski 2003)

• research on social conditions of the introduction of the concept of sustainable development;

• studies on the diffusion of innovations in society, such as sustainable development and the instruments of its implementation;

• evaluation of environmental and social effects of technological transformations concordant with the principles and goals of ecodevelopment;

• modelling and forecasting the effects of sustainable development and, for comparative purposes, of other unsustainable models of development.

Whether such research will have practical use depends basically on whole societies—on the fact if they will follow the consumptionism path or if social attitudes will evolve in a direction closer to the principles of sustainable development.

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ENVIRONMENTAL CONFLICTS AS BARRIERS IN THE SUSTAINABLE DEVELOPMENT OF THE PERIPHERAL REGIONS OF HUNGARY

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Key words: Hungary, sustainable development, economic transformation, urban and environmental problems

INTRODUCTION

The long-term consideration of our environment is presumably the most important intellectual trend—and as such a common task as well—from the aspect of the future of man. The environment-centred attitude of the late twenties—which takes into consideration the interests of the environment and the economic methods together—is the most essential pledge of the sustainable development in Hungary (and of course in all other countries as well). It does not matter if one thinks in global, continental, national or local terms as well but the solution of the environmental problems requires methodical arrangement, organisation, large-scale responsibility and a morale set into new dimensions.

Peculiar and severe environmental problems accumulated in certain border regions and in the so-called inner peripheral and semi-peripheral zones of Hungary during the past decades. These are strongly related to the negligence of the natural conditions, the decline of the economic life, the strengthening of the defencelessness of the local societies and the deterioration of the living standards. These factors considerably impede the closing-up of some of our regions both directly and indirectly not only in national but European terms as well among the new circumstances set by the enlarged European Union. These less developed regions include the microregions in the really peripheral North Hungarian Region and in the eastern border region of the Great Plain, and the inner and semi-peripheral farm districts along certain parts of the River Tisza and the micro-village zones of the Transdanubian region (Balcsók and Dancs 2000). The settlements of these regions concentrate the accumulated backward peripheral situation maybe in the most typical way including the peculiarities of poverty and the characteristics of the environmental degradation. Many signs mark that the socio-economic processes of the present do not really promote

the closing-up of the peripheries to the more developed regions, the existing regional differences still increase and are preserved and the regional lagging behind is spreading.

INTERPRETATION OF THE PERIPHERY IN HUNGARY

The mentioning of the core-periphery term became fashionable in the past few years but the geographical (locational) concept of periphery is often mixed with the economic historical concept. As Wallerstein, American researcher, put it, the core is a region where the economic and social innovations are born and as a consequence of which the economy of the region enters a new competitive development stage resulting in the transformation of the society of the region and in the increase of its welfare. 'Then the innovations appear on the semi-peripheries somewhat later, often modified and losing from their advantages; they do not even reach the peripheries or if they do they are already out of date. The peripheral situation and the peripheral development level, nevertheless, may be interlinked; but while the geographic periphery is constant (with the pace of human history), the peripheral development level may be overcome and may get closer to the core: Scandinavia in the European modern economic history and East Asia in the world economic history illustrate it well' (Enyedi 2003).

In Hungary, the period after the change of regime resulted in an economic-social transformation and the regional disparities and new regional conflicts considerably increased (Figure 1). Although, the regional policy and regional development felt relatively early these unfavourable processes and the amplitude of conflicts raised by them and could not effectively intervene with really efficient tools or overcome the sectoral approach. The number and area of the 'peripheries' which may be approached from many aspects has been increasing continuously. Three fundamentally different contexts may be linked to the peripheries defined by the regional conflicts generated by the various spatial processes: locational (geographic) core-periphery, development (economic) core-periphery and power (social) core-periphery (Nemes-Nagy 1996). The core-periphery relations are relative in all three aspects and are also regionally multilevel. Though, not all of them may be 'projected' to the actual space or spatial processes unanimously but their spatial impacts may be added up and the symptoms and phenomena characterising the peripheries have an accumulated effect. The three spaces 'constructed' on the basis of the above—the geographic, economic and social spaces—do not always correspond with each other at all.

The full-scale evaluation of the core-periphery relations are further hardened by the fact that the concept-pair—as it has been already referred to above—is relative. A core-periphery interpreted on a certain level (economic, settlement, social, institutional, etc.) may act differently on another level. The distances, inequalities and dependences characterising the three types of core-periphery relations differ by the 'meaning content' of the approach. The use of the regional development synonyms of the concept-pair may further tinge the interpretation (urban-rural, developed-backward, central zone-border (peripheral) zone, industrial-agricultural, etc.) or if the local and development 'core-periphery relations' are compared as there is a central core and a dynamic edge, and there is an inner and outer, full and semi-periphery (Csatári 1995).

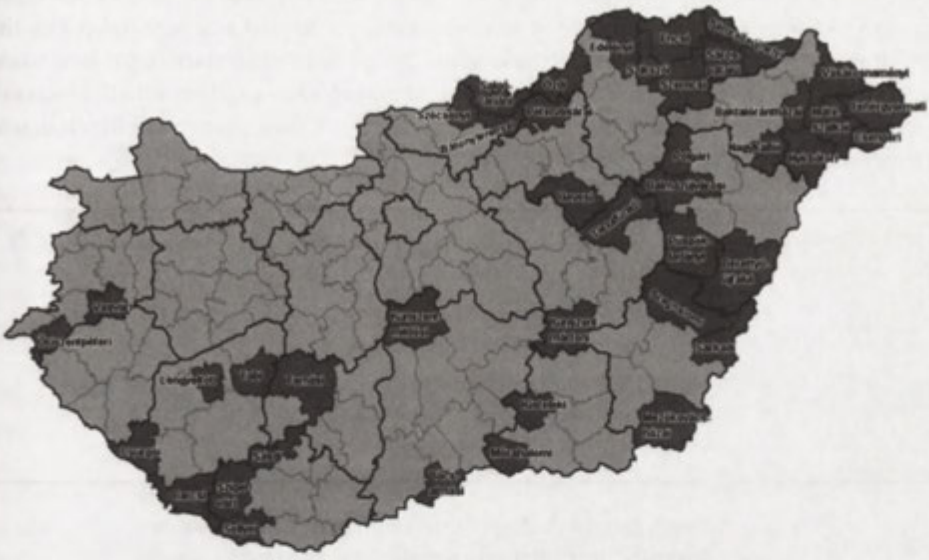

Figure 1. The most disadvantages 42 statistical microregions in Hungary—2003 (edited by the MTA RKK ATI, Debrecen)

ENVIRONMENTAL CONFLICTS IN THE PERIPHERY

As a result of the intensified socio-economic deconcentration processes following the change of regime, some former industrial zones and micro-village regions, and the villages and border regions omitted from the economic artery due to the great distance from the centres became strongly peripheral. These regions got into an accumulatively backward situation partly because of the poor physical, economic and settlement geographical endowments and partly due to the unfavourable macro- and micro-economic factors and impacts (distance from the market, one-sided economic structure based on agricultural backwardness and the lack of considerable industrial production capacity). The border situation in itself provides a peripheral situation only as a regional location element but its secondary meaning conveys a real problem—chronic lack of capital, acute employment crisis, economic problems (Baranyi and Dancs 2001). The marginal 'location' and the peripheral 'situation' often mean the same as the lagging behind of the microregions in the economic competition, the ageing and depopulation of the settlements, the diminishment of the state of the physical and built environment. The regional inequality and the accumulated backward situation may become stable and the settlements of the peripheries are less and less capable of moving out from their present state. The drawbacks of the rural, border and inner peripheral settlements hit by economic crisis—coming into surface in the socio-economic development level—further intensified in the nineties and the peripheralisation even strengthened (Figure 2).

Partly due to the fulfilment of the EU expectations and the increase in the interest towards the issues concerning the environmental protection and regional policy the environmental changes taking place among the peripheral circumstances got into a new light in the past years. In Hungary, environmental protection—together with the issues of regional policy and agriculture—has a distinguished significance especially in relation to the present European integration processes.

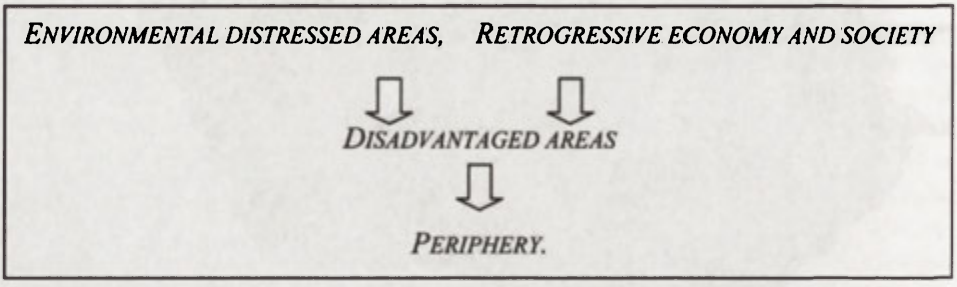

Figure 2. Environmental conflicts—in line with other negative factors—usually determine the evolution of peripheries (edited by the author)

In the peripheries, no environmental strategies have been formed so far due to the low level of environmental management. There are still no operating environmental programmes, the level of waste management and sewerage is deficient and backward, the waste disposals are often illegal, and the infrastructural and transportation opportunities have not improved in the past years.

In the peripheries most of the settlements do not have co-operations with the nearby settlements which would focus on environmental protection. This may mean two things: either the level of environmental pollution is so low that they do not need it or there are no partners or there is no common will or demand for the co-operation—similarly to the other spheres. The future importance of international co-operations may be explained by the fact that in many cases most of the pollution arrives from abroad. In the case of the Great Plain, for instance, most of the pollution comes from Romania and Ukraine.

Negative environmental indices, basic environmental problems can be primarily recognised where other regional researches disclosed peripheries on the basis of the above (county differentiation of the human development index (HDI) UNDP Report 2003, economic potential model, demarcation of economic peripheries, Nagy 2003).

THE ENVIRONMENTAL ASPECTS OF THE ECONOMIC TRANSFORMATION— AS A PERIPHERY FORMING FACTOR

In Hungary, a large-scale environmental pollution happened in the zones of industrial pollution in the past decades. One of the main causes of the unfavourable environmental metamorphosis of the past century was the irrational industrial development and the lack of environmental planning and management—which still exists only on papers in many places. The selection of the locale for the investments was not preceded by impact

analysis and the interests of the population were neglected almost in all cases. Such establishments were settled down in the relatively harmonically operating slightly transformed environment which changed the structure of the natural and cultural landscapes. The artificial intervention—generally causing the start of other interventions—radically transformed the original states and this—by the end of the twentieth century—resulted in an environment which could be sustained exclusively artificially both globally and nationally. The pollutants and the wastes without control, filtering, or professional treatment caused a very large loading in the environs of the companies, factories, sites and along the transport routes. The spread of pollutions and the redoubling of the communal pollutions caused irreversible processes in the majority of the settlement environmental systems which had a negative impact on the environment.

The structural transformation of the period following the change of regime changed the environmental state partly in a positive direction. Nevertheless, the economic and social consequences accompanying the recession resulted in many other conflicts in the already disharmonic environment. As a consequence of the spectacular recession of the industrial activities, then after the liquidation of the large-scale companies, the amounts of the dangerous and 'normal' industrial wastes decreased and the pollution of the air, the surface and underground waters and the soil fell to a relatively lower level. Other negative processes started in parallel with this. Production ceased to exist in many places, man finished is activities, hundreds of buildings and industrial objects became 'unclaimed'. The totallytransformed environment lost its maintainer and thus abandoned zones came into being. Settlement parts and parcels 'stagnating' among degraded ecological conditions and 'rust zones'—environmental peripheries—came into existence which had multiplied the negative environmental indicators. (The size of the environmental peripheries is relative; in fact they can be interpreted from the global level through the regional and local levels o the individual narrow living-spaces). This type of the environmental peripheralisation is usually accompanied by the negative change of many other social-environmental indicaors: the spread of unemployment and deviancies, the out-migration and ageing of the population and the diminishment of the living standards of the inhabitants.

'GHETTO PROCESSES IN THE VILLAGES' IN THE PERIPHERIES

Peripheralisation is further generated by the fact that some of the poorer social groups are confined to settlements which lie further from the urban areas because the real estate pricesare very low on the settlements far away from the centres and the chances for getting access to sites and lands are much better for the mostly unemployed poor population wherethe family can produce at least some of what is the most necessary for living. A considerable part of the former dwellers of the urban workers' hostels also returned to their villages since their working places mostly ceased to exist and the workers' hostels were closed down. A new type of settlement was formed on the periphery of the Hungarian settlement network—the 'ghetto-like village' which is a home of a new social class type, the 'rural underclass'. The term underclass does not simply signify the unemployed, poor or very poor population but something absolutely new in quality. The poor ones always have some kind of—usually of course rather peripheral and subordinated—roles in the given system of the socio-economic division of labour. The underclass, however, consists

of people who became simply 'useless' in the new system of the division of labour as a consequence of certain socio-economic changes. In Hungary, it was caused by the ceasing of the almost unlimited unqualified labour force need of the state large-scale industry whose effect was further worsened by the fact that almost nothing has been done so far for the retraining or some kind of employment of this labour force. This underclass is the great loser of the transformation, they were pushed to the peripheries permanently, those—and their children –, who will most probably never have a job in their life providing a decent living, social security and pension if the present tendencies continue (<www.idg.hu/expo/vorosmarty_ter/berhaz/falund.htm>).

PRIMARY AIMS IN THE PERIPHERIES

For the peripheral regions—considering the demands drafted by them—one of the most important objectives is an intensive development of the local infrastructure. This would generate a serious economic development even in itself, and in addition to it, it would occupy a considerable part of the labour force surplus. The prosperity of the enterprises and the diminishment of unemployment may only be expected if an adequate infrastructure is constructed and a proper preference system is built for the attraction of the capital. Nevertheless, no realisation of a larger scale development concept may happen from one moment to the other without the presence of the expected financial conditions. When looking for the breaking-out points in the regional and rural development strategies the overall modernisation of the technical infrastructure, the development of the downtown road network, gas, road, telecommunication and sewage networks and public lighting, the communal waste management and the preparedness and knowledge of the self-governments and the human sphere must be given priority. Beside the economic interests, environmental protection and the local agricultural sector must undertake some kind of social role and responsibility in co-operation with the self-governments. The self-governments need to join the EU and national programmes, and they should fully exploit the assistance offered by the supports. A further precondition for the more efficient action is local and regional co-operation since considering the endowments and barriers of the certain settlements they might 'share' the environmental management tasks among each other.

ENVIRONMENTAL CENTRES, PERIPHERIES, SEMI-PERIPHERIES

Taking the traditional social scientific approach as the starting-point, the 'core and periphery' comes into being as a consequence of the different development of the physical and social space both in time and space. Consequently, there are core areas with different development levels and backward edge-areas lying far away from the centres. From an environmental point of view, it may be established with regard to the core-periphery relations that environmental sustainability shows spectacular results in the centres but the future of the peripheries is uncertain and doubtful—the backward regions have to face complex problems. There are so-called semi-peripheries between the two extremes. This concept may arise a question when looking at the manifold dimensions of our environment: Is there a space at all where the natural and social processes happen in harmony and in a stable way and where the environmental, economic and social pillars of sustainable development are present together or are the global, regional and local spaces made

up of environmental semi-peripheries at various stages? In fact, the global environment of all spaces is overloaded but the environmental indicators of the certain landscapes and settlements in the narrower local or microenvironment express constancy and thus shows the signs of sustainability. These can be the parts of the physical environment: protected areas, national parks, or the sustainable settlement environment but can also be the elements of the cultural-intellectual environment as well: e.g. environment-conscious activities, ideas, or the positive environmental behaviour, consciousness and attitude. In an absolute sense, therefore, there is nothing like an environmental centre but in relative terms—comparing them to the peripheries—there are several smaller environmental centres in the material and in the immaterial sphere as well.

URBAN PROBLEMS, i.e. THE DIFFUSION OF ENVIRONMENTAL PROBLEMS FROM THE CENTRES TO THE PERIPHERIES

Most cities are settlements with central functions, which are complemented by a gravity zone consisting of bigger or smaller settlements. In the hierarchical space, in many cases, there are semi-peripheral settlements in the vicinity of the cities interpreted as main or sub-centres. If we started out from the traditional interpretation of the core-periphery relation then the degree of the sustainability of the settlement environmental systems would depend on the central function, we would find more favourable conditions in the centres than in the semi-peripheries and the differences within the gravity zone would diminish in parallel with the spread of the positive environmental processes into the peripheries.

The diffusion of environmental problems, however, is rather peculiar unlike that of the economic processes. The dangers and impacts of the risks are different if we look at it exclusively from the aspect of the town and if we treat them as part of a larger system in the relation of the centre-gravity zone. The air pollution caused by the traffic, industry and heating, the unaccomplished nature of canalisation, the problems of industrial and communal water pollution, waste treatment and management, the diffuse dust and extreme pollutions—and their spatial spread in the environs of the pollution sources—mean serious danger within the city, or even in the closer and remote environs of the city depending on the type of pollution.

The present urban living style, especially the land use, transportation, industrial production, agriculture, consumption and the free time activities are essentially responsible for many environmental problems which the inhabitants of the capital—ad in its agglomeration or even in other cities and their gravity zones—or of the peripheries have to face equally (Table 1). The urban problems, therefore, are not only experienced by the inhabitants of the core areas but also by the population of the rural areas.

The cities are the formers and at the same time key actors of the changing lifestyle, production, and land use customs. For that very reason, the environmental sustainability of the Hungarian urban settlements also means the retention of the majority of the natural capital. It requires from us to limit the use of the renewable energy resources to an extent where the natural systems restore themselves, and that the use of the non-renewable resources should not exceed that extent when the sustainable renewable resources may replace them.

Table 1. The main environmental problems of the urban areas as periphery forming factors

Impact factors and reasons causing conflicts	Main environmental danger sources	State indicatives of the danger sources	Periphery forming processes, territorial conflicts
• industrial, • agricultural activities • transportation, communal wastes, pollution • landuse • river regulation • mining	• air pollution materials • sewerage • waste • noise	• air • surface and underground waters • soil contamination • public health	• lack of settlement and company environmental infrastructure • deterioration of the built environment • stagnation and decline of the local economy • social problems • deterioration of the health state of the population • diminishment of the living standard • demographic problems

Consequently, urban environmental sustainability may not only ensure the conservation of biodiversity but also the preservation of human health, human life and welfare. If the balance loosens in the cities then it can be felt in the gravity zones as well. (For instance, if the transportation demands increase together with the increase in the supply with cars but is not accompanied by the building out of the infrastructure then it will lead to a more intensified air pollution which causes environmental problems in the urban areas and around them as well).

The city is a unit which is capable of fundamentally influencing the natural and environmental balance of certain areas through its economic, social and political life. All cities, cooperating with its neighbouring settlements, need to find the most optimal way to sustainability which will let it ensure the healthy environment and the economic-social development. Sustainability is not a vision and not a stable state, but a creative local process searching for balance which must spread onto all areas of the decision-making processes locally and in the gravity zone. The continuous feedback may provide a basis for the simultaneous creation of the urban and rural ecosystems. The disproportional distribution of the economic and social power relations within the country leads to a non-sustainable behaviour and makes the chances for the changing more difficult. The city cannot afford itself to transmit its problems into the wider environment, therefore, any type of environmental disturbance in balance awaits a solution primarily within a city.

ENVIRONMENTAL VISION OF FUTURE FOR THE PERIPHERIES IN HUNGARY

The future of the peripheries is uncertain. The following three scenarios were introduced by Szlávik and Füle in their work entitled 'Nice, new (green) world': the alternatives of the

positive, slowly developing and negative regional development. It is of crucial importance from the aspect of peripheries that which of these versions shall become a reality....

POSITIVE ENVIRONMENTAL SCENARIO, REGIONAL EQUALISATION

This scenario presupposes—keeping the closing-up of the peripheral areas in front of its eyes—that the European Union is able to progress towards sustainability in the first decade of the millennium. In this case the support system of the EU, theoretically, will effect into the direction of the equalisation of the development levels of the future member countries and the regions within them. The principle of the regional developments is to modernise the inner resources of a given region, therefore, the regions do not function as areas with a uniform profile in parallel with each other but as areas complementing each other and forming a network, thus, in a certain sense the traditional core-periphery relations disappear. Presumably, from May 2004 Hungary will also get a share from the advantages resulting from the technological developments.

The Hungarian entrepreneurial developments are characterised by the gradual expansion of environment-friendly, clean technologies, the economy does not take in the obsolete second line—and consequently more polluting—technologies. The lifespan of the use of the products will increase and this will make the maintenance and repair activities more attractive which are expected to have positive impacts on the employment. The decrease in the environmental loading, the increase in the environmental security, the more balanced regional development and the spread of the labour related to the dwelling place or close to it in parallel with this (through the moderation of the pollution caused by the traffic) will together result in the diminishment of the health damaging effects which may be attributed to the environmental damages.

The status of the country will be similar to the situation of the advanced countries of the present cohesion group of the EU both in general and within this with regard to its natural and built-in environmental policy. More and more local self-governments prepare and implement their programmes based on the principle of sustainable development, and thus, the role of the microregions and small communities increases in the solution of the environmental problems of the semi-peripheries and regions with cumulatively backward environmental indicators.

In the agriculture, the production profile moves into the direction of bioproducts, organic and environment-friendly procedures which decrease the use of the chemicals, pesticides and fertilizers and the soil pollution caused by them. At the same time, however, the traditional economic technologies preserve their dominances—although their ratios somewhat decrease. Biodiversity does not worsen any longer. This may be, first of all, led back to the spread of the environment-conform procedures applied in agriculture, secondly due to the spread of the national parks, environmental protection areas and the more effective nature conservation there, and thirdly to the improving social environment-conscious behaviour.

The forming of an environment-conscious attitude has become the key point of the educational system in all regions of the country from the lowest level (kindergartens) to higher education—including the various levels of extension trainings as well. (The educational system treats the environmental impacts, the touch of the various materials of

knowledge, professions and specialised areas as their organic parts, and in addition to this it spreads the environment-conform thinking as a basic element and principle of the education related to the way of living).

SLOW DEVELOPMENT, LOW EFFICIENCY ENVIRONMENTAL PROTECTION IN THE PERIPHERIES

The economic growth continues within the European Union, the position of the macroregion occupied within the world economy is somewhat worse but the EU endeavours to implement its sustainable development programme. The funds within the EU grow very slowly due to the resistance of the donor countries and the demand for the preservation of the support forms will be strong from the part of the earlier joined countries. The closing-up of the Central European countries is slow in this model.

As a consequence of the financial problems of the European Union, the derogation needs of the newcomers are treated in a 'liberal' way; there are no hard requirements to keep the strict community norms. Hungary gets into the second line in the cohesion zone of the Central European countries among the new member states and the pace of the regional equalisation is slow and protracted. Environmental regulation fulfils the requirements of the European Union on the area of the legal regulations but the implementation is soft because there is a serious resistance both among the inhabitants and most of the ventures. Within the solutions offered by the environmental policy the low efficiency the subsequent environmental protection is the dominant.

Due to the weak enforcement of the principle of subsidiarity the role of the local self-governments strengthens only to a small extent in the repression of environmental damages. The organisational structure of the self-governments on the level of the settlements enlarges and they tend to employ professionals and experts for the fulfilment of the tasks of environmental protection. The deprivals on the by the right of environmental protection get into the budgets of the self-governments in a higher ratio and the character and extent of the pollution to be avoided becomes an influencing factor in the division of the remaining centralised allocations. Besides all these, however, the 'soft' treatment of the environmental problems will remain in the value system of the self-governments.

The state of the environment does not improve—or it does only very slowly—the environmental pollution affecting health does not diminish but in fact probably a little bit increases. The number of diseases related to environmental pollution stagnates: the number of allergy, asthma and chronic respiratory diseases increases. The exploration of the polluted areas and the analysis of the expected health damaging risk are late.

The environmental-conscious education and formation of consciousness is dominated by the traditional, subsequent environmental protection, there is no qualitative breakthrough. The activities of the growing number of trained environmental experts are limited to the observance of the regulations.

NEGATIVE SCENARIO, DETERIORATION OF THE STATE OF THE ENVIRONMENT

The European Union is pushed into the background in comparison with the main world economic centres concerning its power. The global and regional environmental conflicts are sharpening and the series of crisis management require considerable resources.

Environmental protection is dominated by low efficiency subsequent instruments both with regard to the environmental and the economic aspects. Only the multinational companies employ—primarily for strengthening the green image—the slowly changing environmental management norms. The norms differ by economic regions with regard to the strictness of the regulations, the urban environmental strategies are casual and the rural infrastructure is still not constructed.

In Hungary the positions of environmental protection worsen and they are subordinated to the low efficiency economic growth. The danger of the application of environment-polluting technologies increases in the industrial production under the economic pressure. The number of companies qualified by environmental norms decreases. Hungary gets into a peripheral situation within the European Union and further economic and social lagging behind can be detected within the country. Agriculture is conducted on the lands disintegrated by the transformed ownership structure with the application of environment polluting methods—due to the lack of knowledge and capital. The negative impacts of the former polluting agrarian technologies (especially the soil contamination) are not eliminated.

As a consequence of the narrowing budget possibilities, no emphasis is laid on the monitoring of the environment related health injuries and the handling and treatment of the damages on the social level. Prevention only affects the most spectacular average-like events and areas which are the most perceptible for the public (e.g. chemical industrial accidents). The extent and impact of the health injuries caused by environmental pollution is not clarified. The programmes are campaign-like and allocate only occasional financing.

The development resources of the local self-governments available for environmental protection are narrowing. There is a lack of interest concerning the employment of an expertise layer who would be able to treat the environmental issues in merit, the management of the prevention processes belongs to the duties of the regional environmental protection authorities. The financial resources available for the purposes of environmental protection are centralised, their distribution is primarily based on quotas or they are used for the prevention of occasional damages.

The sensitivity for the non-material values and the environmental consciousness are on a low level in our society. The media has only a moderate impact on the environmental thinking which plays a subordinated role in the social value system—due to the lack of the marketing value. Environmental education is mostly limited to the transmission of knowledge necessary for the prevention with a relatively narrow scope of secondary and tertiary training. The environment-friendly lifestyle is pushed on the periphery in the education.

The regional differences and conflicts intensify within the country. In the lack of the adequate resources, the closing-up of the eastern areas is late, the developments concentrate on the areas with existing infrastructure and qualified labour force.

Biodiversity deteriorates drastically. The reasons for this include: the diminishment of the area of the nature conservation areas, the moderation of the available financial resources for the protection of their values, the use and territorial spread of chemicals in agriculture and the narrowing of the natural living-space (Szlávik and Füle 2002).

EPILOGUE

The environmental problems appearing in the peripheries are very severe. Even if there is an extremely bad situation, the problems do not automatically lead to the appearance of environmental protection. It is only the social demand formed on the basis of the environmental interests that is able to create the sustainability of the less developed rural areas independently from the political system. The fact whether it is the dominance of an environmentally conscious attitude within the settlement environmental systems in the peripheries or the devastation of the environment due to the setting into the foreground of the short-term economic aspects is mainly the function of the sense of responsibility of the local experts dealing with environmental protection and of the inhabitants and their willingness to act expressed both mentally and financially.

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SPATIAL CONFLICTS IN RURAL AREAS OF HUNGARY

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Key words: Hungary, rural areas, regional conflicts, sustainable development

ON SPATIAL CONFLICTS

This lecture sets out to interpret and make a rural geographical adaptation of the concept of spatial conflicts. The social sciences offer a number of theoretical approaches to research into conflicts. According to the Marxist one, differences arising from legal, geographical and ownership dichotomies between major units of the society are to be expected and inevitably lead to conflicts.

Nevertheless, state socialism dismissed the existence of significant regional differences for a long time and, adopting a number of methods (e.g. industrialisation by establishing industrial plants in the provinces, the development of public services in small towns, strengthening the effects of large-scale agriculture on rural settlement development and encouraging the practice of daily and weekly commuting), it strove to minimize these conflicts in the rural space that were, indeed, to be expected.

After the political changeover, during the period of transition to a market economy, the legal environment and ownership structure both fundamentally changed. As a result, regional conflicts of various types, affecting wide areas, emerged and rapidly became apparent and in a rather striking manner in the rural space. They included unemployment, poverty and the problems of the peasants and the political demonstrations organised by them.

Another major approach to conflicts (e.g. Habermas) claims that it is benefits in decision-making and holding power, deriving from fundamental relationships between the individual sub-systems of society, which control conflicts. If we adopt this approach to new regional conflicts, i.e. the ones that have occurred over the past decade and a half, in Central Europe or, for that matter, Hungary, we can safely say that the provinces have nearly lost all their decision-making powers. It is true that, for a year or two, following the first free and democratic elections that established them, local councils in

villages and rural areas generally believed that they would be able to solve most of the local conflicts.

However, it shortly transpired that they had practically no financial resources and even less power to do so. The very low election turnout in the provinces also indicated this.

The nearly complete dismantling of the socialist agricultural system—a vital regional and social sub-system in the provinces—has caused a major problem for rural areas in Hungary. Though the 1 million new landowners did include some of the former farm managers, often referred to as 'green barons', and a few of the legal successors of former state farms, they were able to offer solutions to the problems of only a very thin layer of the rural population. Their concerns did not include the cause of the public good or the issue of rural communities. The type of regional conflict that is common in the provinces, i.e. the one between transformed large-scale agriculture and what is called the eco-social, environment-friendly and sustainable agrarian sector, seems to be almost insoluble.

A third approach to conflicts (e.g. Dahrendorf) claims that 'inevitable' conflicts are unavoidable consequences of daily life. The main issue is the extent to which the resolution/settlement of conflicts is institutionalised or emerges in a socially accepted pattern (Ayissi et al.). This approach offers the simplest interpretation. And indeed, the majority of rural problems may well seem to be 'commonplace, daily occurrences'. Sometimes even time seems to stop flowing in the countryside. Only the rural landscape is becoming depopulated and ageing in the meantime, with its natural environment gradually being destroyed and its value diminishing. Land for ploughing is also undervalued. Owing to serious macro-economic conflicts and adjustments warranted by EU accession, society has also failed to attach sufficient importance to rural conflicts in the 'whirlwind' of the profound political transformation in East Central Europe.

Quietly going about their daily lives, the rural inhabitants do not rebel. Unable to establish a system of professional and political institutions in order to raise social awareness of the gravity of the problems they face or, at the very least, of the importance of the rural space in the country's sustainable development, rural society is in despair.

Essentially, specialist geographical literature adopts three approaches to regional conflicts: (1) social security and environmental protection (2) identity and prosperity and (3) a unique regional 'unity' of (1) and (2), or the lack of it (Csatári 2004).

If these 'inevitable and unavoidable' regional conflicts are categorised on the basis of the 'dimensions' of their occurrence, (A) their community, (B) their regional and (C) their international dimensions require different approaches and methods of evaluation (Nemes-Nagy 1996).

A 'CHECKLIST' OF RURAL CONFLICTS

In the rest of the lecture I will discuss the three major approaches to regional conflicts (Table 1) and offer a 'three-dimensional' evaluation of them in rural areas in Hungary (Figure 1). The nine possible combinations generate the following main conflicts:

As the number and gravity of these characteristically rural conflicts also show, the three million plus living in the rural space that constitutes 75% of Hungary's territory can

Table 1. Major approaches to regional conflicts

Direction/dimension	Social security and environmental protection	Identity and prosperity	Regional unity or its absence
Community dimension	Unemployment Disruption of traditional communities (Picture 1) Loss in value of community property	Low prestige of agriculture 'General' impoverishment of the rural population Sharp income differences locally, adding to social polarisation (Pictures 2, 3) Lack of a shared future vision	Partly inherited town and country dichotomies Lack of micro-regional level professional cohesion Lack of broad-minded political leaders on the regional level
Regional dimension	Danger of increased aridity Increased danger of floods Costly and low-quality accessibility	Increasing regional differences Shortcomings of regional identity Few regional successes Lack of a future vision on a regional level	Regional break-up of former economic relations Weak regional markets Infighting owing to a scarcity of development funds
International dimension	Constraints imposed by European regulations A low level of language proficiency Rapidly changing new needs	Illusions about the system of EU subsidy funds Low-profit cross-border co-operation	Uncertainty about the future of the EU regional system Necessity of establishing new large units of development (the Carpathian Basin, the Carpathian Euroregion and the Visegrad 4)

only significantly reduce the number and extent of regional conflicts if they adopt new 'future-oriented' methods of planning and development.

CONCLUSIONS AND FURTHER ISSUES

In connection with the above, it is a complicated question whether certain stages of rural development can be skipped or not.

Providing consistent and high-level support for agriculture, helping rural infrastructure catch up with urban infrastructure and ensuring accessibility (and mobility), rural development policy in advanced European economies actually led to a gradual increase in the prestige of rural areas.

Only when this process was over did nature protection, the planned management of rural resources—like tourism and the social economy—and the successful implementation of models of the sustainable development of rural economies and societies follow. This almost invariably went hand in hand with the establishment of a relatively developed network of relevant institutions.

Based on information available on the above regional conflicts in rural areas of Hungary (Figure 2), it is hypothesised that there will be such rural areas where the number

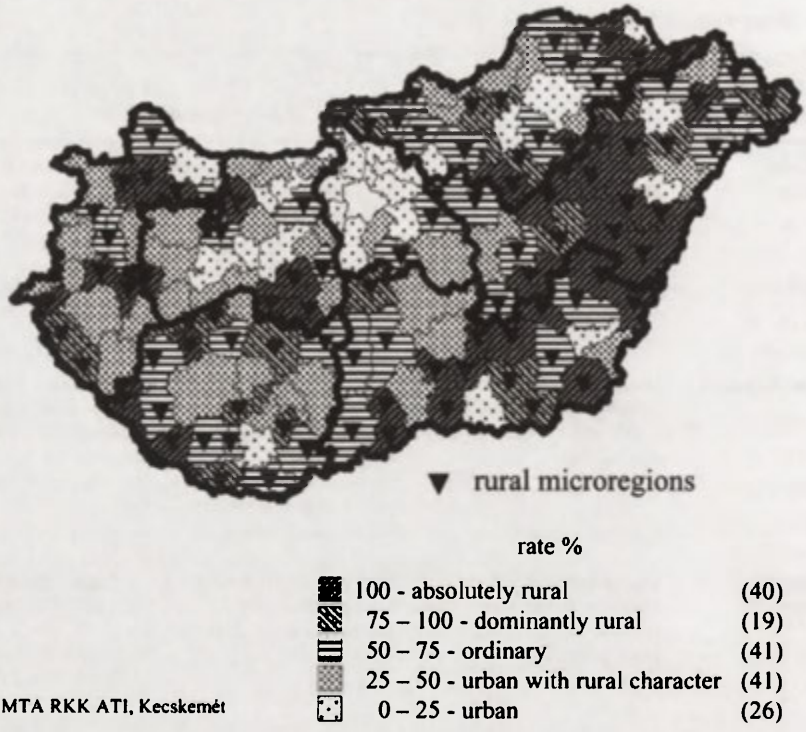

Figure 1. Index of rurality Hungary

of conflicts is reduced or conflicts themselves are eliminated slowly and gradually, while each stage of development is passed through and the usual approach to planning and development is adopted.

However, it is equally important that a chance be given for rural development based on local innovation, creativity and ingenuity. Under such a scenario, knowledge, capital, technology and a satisfactory amount of tolerance should be able to solve rural problems faster and more dynamically.

Overall, then, a diverse rural policy is needed that is able to offer clear alternatives, rely on grassroots contributions and not only resolve regional conflicts more rapidly but also provide future perspectives while doing so.

For the time being, no such policy is available. What is at stake while we wait for the adoption of such a policy is the countryside itself, which may perish completely. There is also the danger of it being deserted by those who—relying on the various interpretations of rural conflicts (security, protection, identity and regional unity) and community, regional and international dimensions shown in the table above—could really resolve these conflicts.

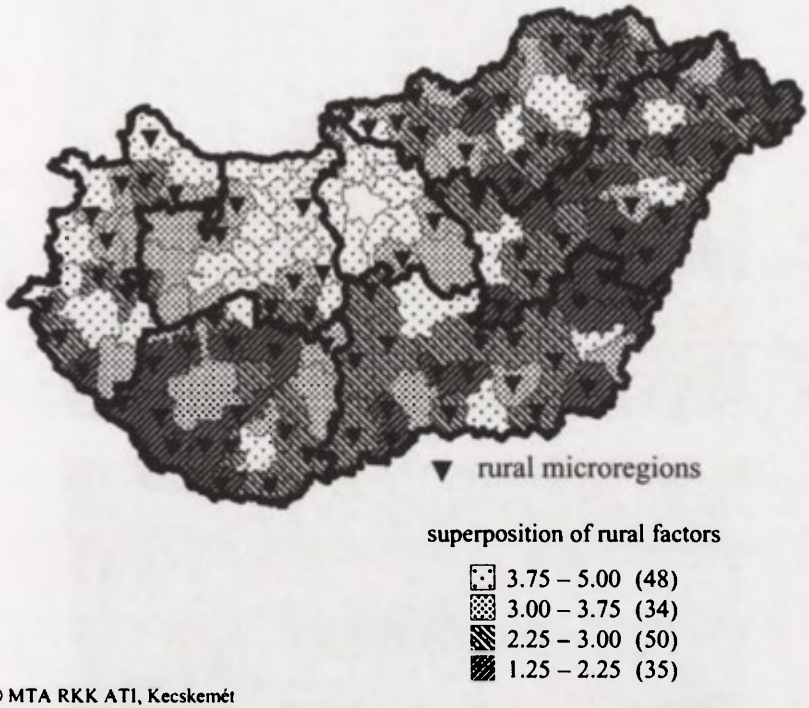

Figure 2. The aggregation of rural conflicts (with the index of rurality).

Photo 1. The conflict of the rural–urban fringe in Kecskemét.

Photo 2, 3. The 500 metres wide apart, spatial conflict in rural area.

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SPATIAL CO-OCCURRENCE OF AGRICULTURAL AREAS AND REGIONS OF SOCIAL EXCLUSION

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INTRODUCTION

Social exclusion is the situation that hinders or simply prevents an individual or a group from using public goods and social infrastructure as well as from gathering the stores and obtaining incomes in an estimable way. Social exclusion affects mostly the following groups: children and the youth from neglected societies, victims of family life pathologies, low-qualified workers, people living in rough housing conditions, the sick, the old and the unemployed especially long-term ones (*Narodowa Strategia...* 2004).

A similar approach to the issues of poverty and social exclusion has been presented by Byrne (1999), Lawless, Martin and Hardy (1998), Atkinson (1999), as well as by Jordan (1996). Madanipour, Cars and Allen (1998) stressed that social exclusion is more related to the geographical area than to a particular social group: 'Social exclusion is defined as a multi-dimensional process, in which various form of exclusion are combined (...) and create acute forms of exclusion that find a spatial manifestation in particular neighbourhoods' (Madanipour et al. 1998: 22).

In this paper various features characterising unemployment were assumed as the main rate of social exclusion. Among important social results of unemployment the following should be named: loss of social position, degradation of skills and qualifications and weakening of social relations (Nowosielska 1995).

It seems however that poverty is the most important result of unemployment. In 2002 in households with at least one jobless member about 23% of people spent on providing their subsistence less than existence minimum[1] intends. In turn, in families without the

[1] Existence minimum—needs providing of which cannot be postponed and amount of money that enables consumption on the level which does not put proper biological growth in danger.

unemployed share of such people was 3 times smaller and amounted to 8% (*Narodowa Strategia*... 2004).

The paper aims to analyse spatial co-occurrence of agricultural areas and regions, inhabitants of which are touched by the problem of social exclusion caused by unemployment. Hypothesis that intensity of social exclusion depends to great extend on functional character of examined area was advanced in the paper. Analysis was carried out for year 2003 and counties were used as the basic unit in spatial research (NUTS 4—'*powiat*').

This paper also aims to analyse spatial aspects of unemployment in Poland as a phenomenon, which is one of the most important reasons of social exclusion. Research was based on both quantitative and qualitative features of unemployment.

METHOD

In this paper the phenomenon of spatial exclusion caused by unemployment was described with five features:

(1) unemployment rate,
(2) share of unemployed not-entitled to the benefit,
(3) share of long-term unemployed (jobless longer than 1 year),
(4) share of young unemployed (younger than 35 years old),
(5) number of registered unemployed per job-offer.

In turn, agricultural areas were designated on the basis of:

(1) share of arable land in total area,
(2) share of households supporting themselves on agriculture.

Synthetic indexes for these phenomena were calculated according to the following formulas (Parysek and Wojtasiewicz 1979):

$$W_s = \frac{1}{n}\sum_{j=1}^{n} y_{ij}$$

where: W_s—synthetic index, y_{ij}—standardized value of feature *j* for unit *i*, n—number of used features.

Value of feature *j* for unit *i* was standardized according to:

$$y_{ij} = \frac{x_i - x_{i\,min}}{S(x)}$$

where: x_i—value of feature, $x_{i\,min}$—minimum value of feature, S(x)—standard deviation.

Classification of all aforementioned seven component features and two synthetic indexes was worked out on the basis of arithmetic mean and standard deviation. Five following classes were designated:

Class	Way of class designation					Feature value
I			W	≥	x + S(x)	Very high
II	x + S(x)	>	W	≥	x + ⅓S(x)	High
III	x + ⅓S(x)	>	W	≥	x – ⅓S(x)	Average
IV	x – ⅓S(x)	>	W	≥	x – S(x)	Low
V	x – S(x)	>	W			Very low

where: W—described feature, x—arithmetic mean, S(x)—standard deviation

Thanks to use of aforementioned procedure range of three middle intervals in each division is equal to 2/3 of standard deviation.

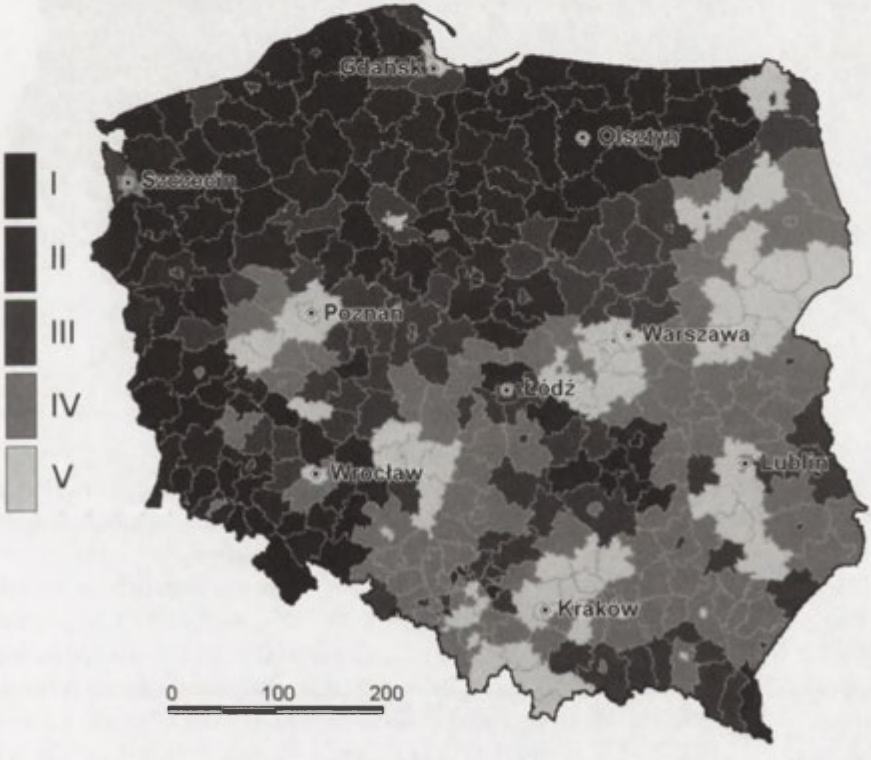

Figure 1. Unemployment rate in counties, 2003

SPATIAL ANALYSIS OF UNEMPLOYMENT

Unemployment is diversified in regard of demographic situation of the jobless, its reasons and results it causes as well as it shows great spatial diversification. This last feature is connected to economic and development potential of various areas.

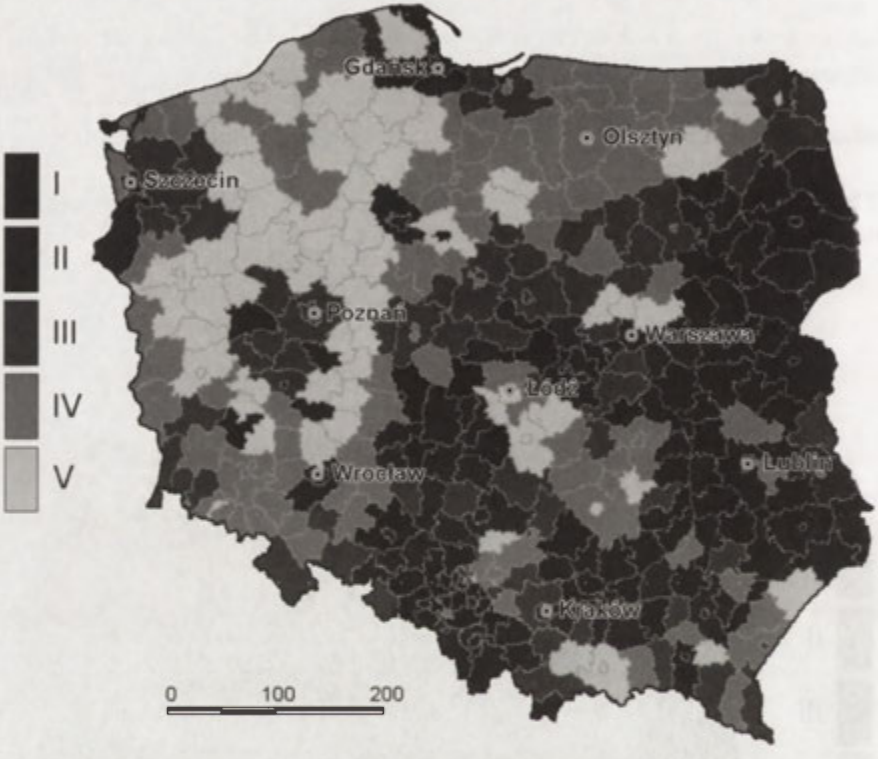

Figure 2. Unemployed not entitled to the benefit in total number of registered in counties

Spatial analysis of the unemployment will be carried out in five categories that have the greatest influence on social exclusion: unemployment rate, title to benefit, long-term unemployment, the youth's unemployment and number of job offers.

Unemployment rate is the basic feature that describes those phenomena. Its values are very diversified spatially in Poland—from 6% in Warsaw to about 40% in north-west part of the country (Figure 1). Counties where in communist period socialized economy in agriculture was carried out are the most susceptible to high unemployment. When state farms were closed down in 1992, rural workers were dismissed. Lack of bigger urban and industry centres as well as low qualifications and education together with disability to run own business led in those areas to the highest level of unemployment described in the quantitative way. Extreme poverty rate in these areas is higher than average for Poland by from 20% (Zachodniopomorskie) to 50% (Warmińsko-Mazurskie voivodeship).

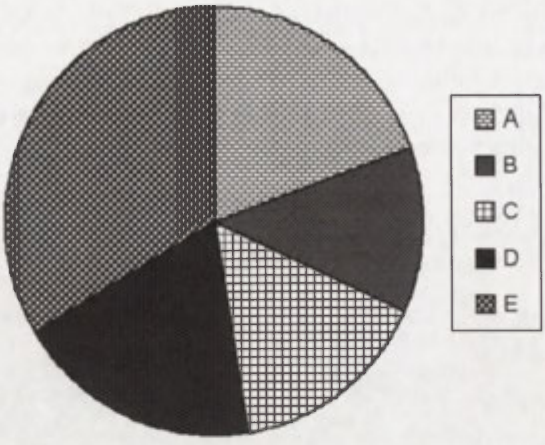

Figure 3. Structure of registered unemployed by the time of being jobless
A—less than 3 months, B—3–6 months, C—6–12 months, D—12–24 months,
E—more than 24 months

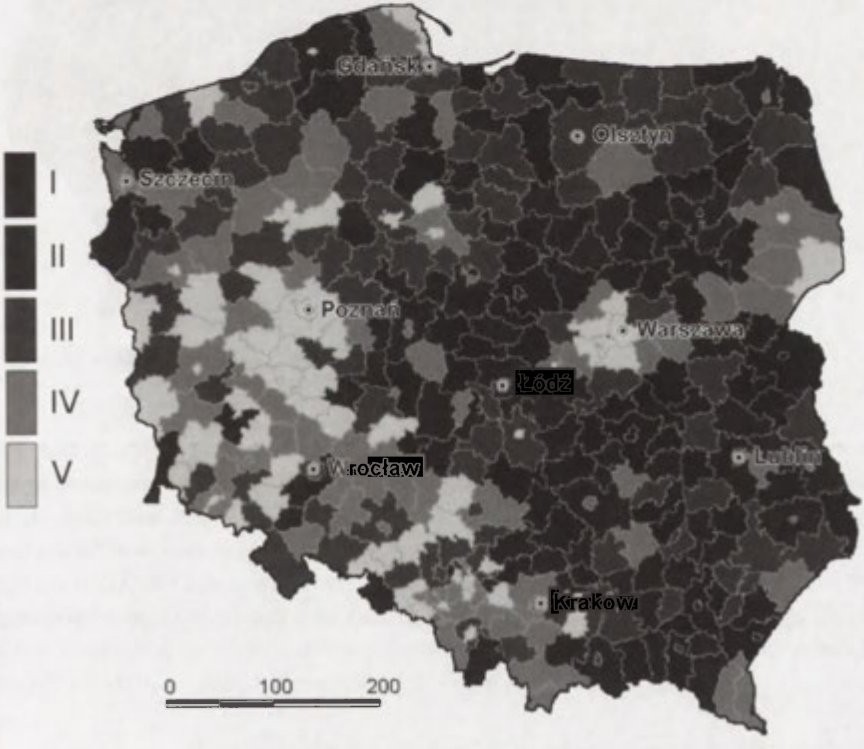

Figure 4. Unemployed longer than a year in total number of registered in counties

Nearly 42% of registered unemployed lived in the country whereas rural inhabitants are 38% of Polish population (*Informacja o stanie...* 2004). Additionally one should take into consideration people who are unnecessary in rural household works but cannot be registered in labour offices because of legal reasons. Among other this is one of the causes that the share of people living under existence minimum is in rural areas 3 times higher than in cities with over 200 thousand inhabitants.

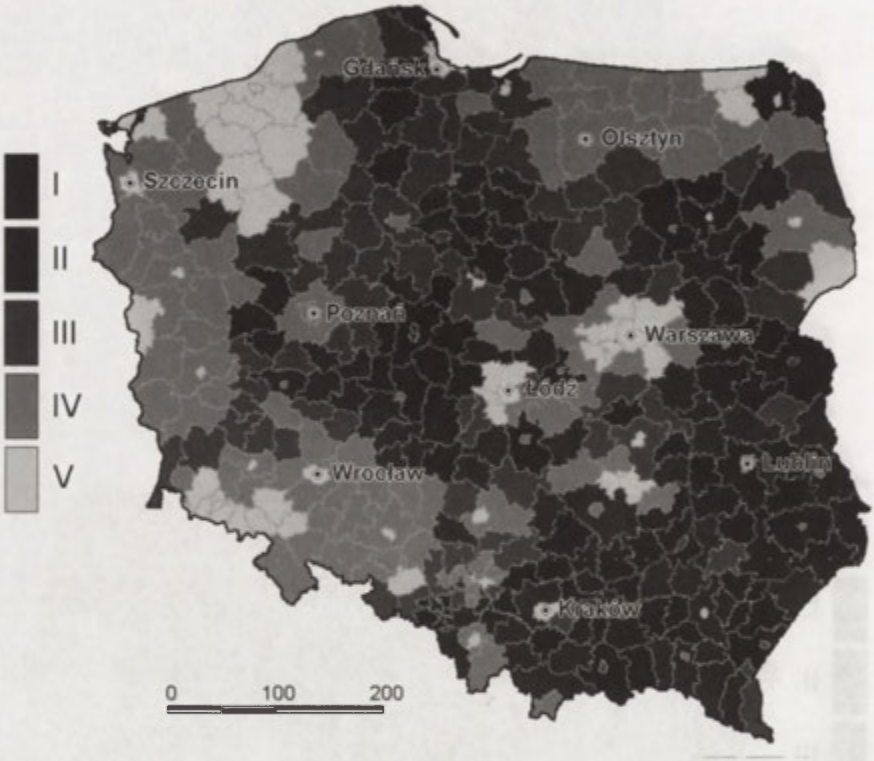

Figure 5. Unemployed younger than 35 years old in total number of registered in counties

Only little part of people is entitled to the unemployment benefit (it is regulated by the Act of Employment and Prevention of Unemployment). In 2003 15% of the unemployed received the benefit. The height of this service is about 60% of the lowest salary and presently equals €120. The highest share of people receiving the benefit was characteristic for north-west Poland, however even in this region only every fourth unemployed was entitled to the benefit (Figure 2). The least favourable situation occurred in eastern Poland and Upper Silesia region.

Long-term unemployed are among jobless people the group that is the most seriously endangered by social exclusion. There are couple of causes of such a situation (Nowosielska 1995):

- the longer one stays unemployed, the harder it is to find a job,
- searching becomes less intensive,

- the unemployed adapt to the lower standard of living,
- employers do not want to employ people who are jobless for a long time,
- long-term unemployed lose title to the benefit.

In Poland half of the unemployed is jobless for more than one year and one third cannot find work longer than 2 years (Figure 3). The highest share of long-term unemployed occurs in eastern part of Poland, which is area with the lowest rate of entitled to the benefit (Figure 4).

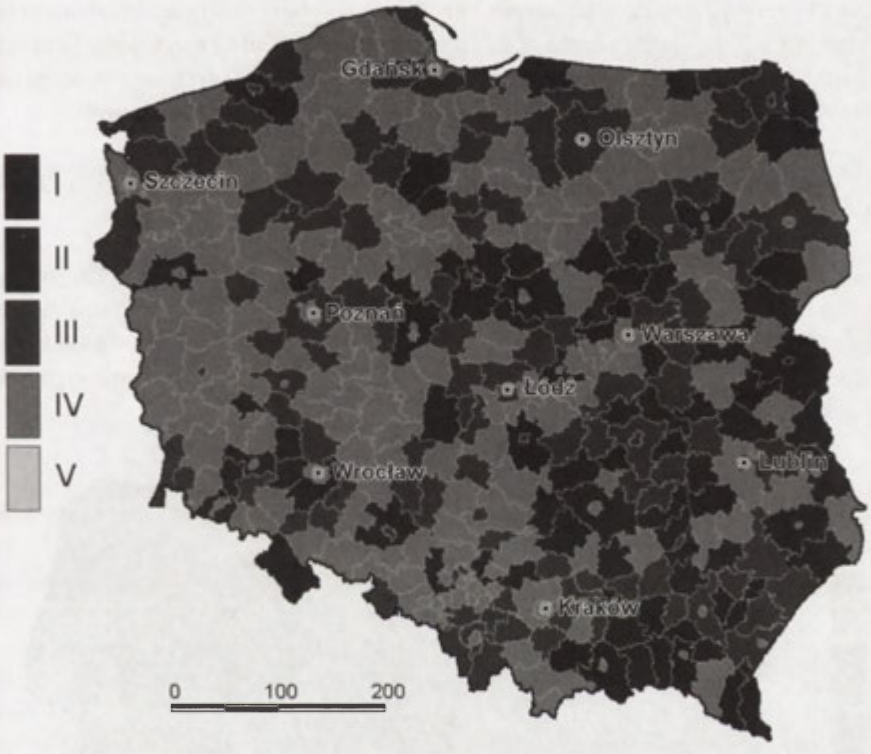

Figure 6. Registered unemployed per 1 job offer submitted to the labour office in counties

Only in Warsaw and counties around the capital emerges area of significantly lower long-term unemployed rate. It shows that in Warsaw there are much more opportunities to find a job in shorter time. Such conclusion is proved by the values of this rate in other cities in Poland.

People without traineeship or with experience shorter than 12 months are 40% of the unemployed who search for a job for more than a year. Every second jobless is younger than 35 years old. The unemployment of the youth is considered as especially adverse as families in this age group are in the development phase and raise children. People up to the age of 35 are almost 40% of adults living in extreme poverty (*Narodowa Strategia...* 2004). The highest rate of the youth unemployment is characteristic for areas of south-eastern and central Poland (Figure 5). Again, in cities exist notably more possibilities to work for the young. Remarkably lower unemployment rate among people younger than 35

years old in areas where state sector of agriculture used to dominate does not come from lack of such a problem. But is rather caused by greater number of the jobless in middle age, who lost their jobs during restructuring of state farms (Gawryszewski 1993).

In 2003 on average there were 85 registered unemployed per each offer submitted to the labour offices. Spatial distribution of this feature shows complex structure. However, much more offers were lodged in western Poland and big cities than in eastern part of the country (Figure 6). Private firms came forward with nearly 3/4 of all submissions. Of course the unemployed find the job not only thanks to offers published in labour offices, but very often it is the first source of information about potential employers. That is why small number of offers in some regions makes the time of a job-search notably longer and, in that way, increases the process of social exclusion of long-term unemployed.

SPATIAL ANALYSIS OF SOCIAL EXCLUSION

Classes I and II characterise areas inhabitants of which are endangered with the high level of social exclusion caused by unemployment. This phenomena is seen the most clearly in eastern Poland- counties lying in the outskirts of Mazowieckie, Lubelskie, Świętokrzyskie and Podkarpackie voivodeships (Figure 7). Such adverse situation occurred although hidden

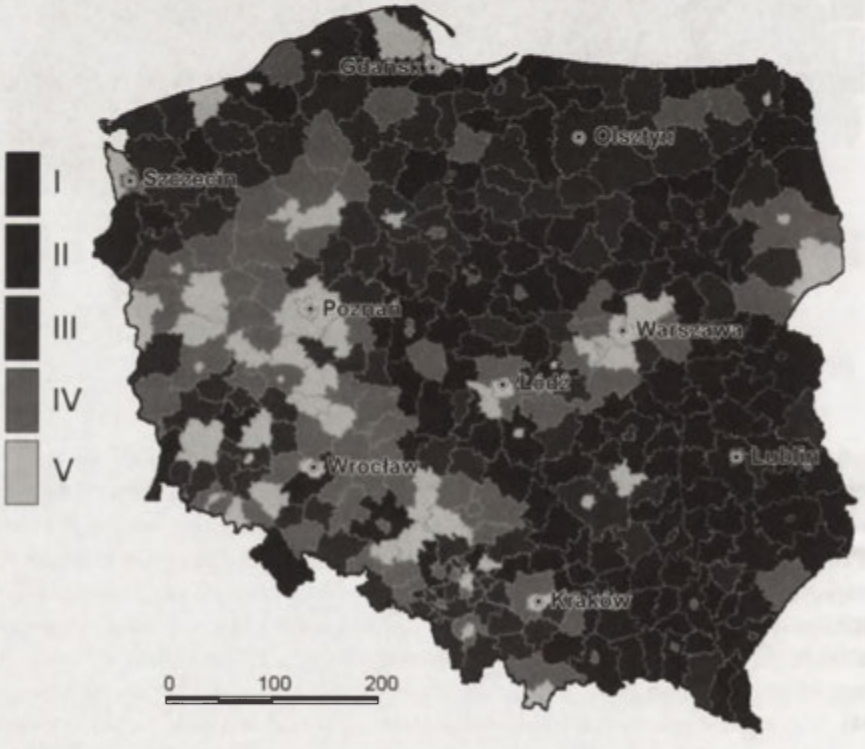

Figure 7. Counties in Poland according to the intensity of process of social exclusion caused by the unemployment, 2003

unemployment, that is heavily severe in this region, was omitted in the analysis. Class III describes counties with average social exclusion of their inhabitants and consists in vast majority of both areas where communist economy used to be carried out in agriculture and Upper Silesia conurbation with its restructured mining and heavy industry. In turn, classes IV and V includes areas inhabitants of which are endangered with unemployment in small extent—that is among all cities and suburbs. For instance, definitely more favourable situation in Warsaw agglomeration than in counties located further than 50 km away from the capital is observed. Moreover, counties of western Poland, that is characterised by level of economic development higher than the rest of the country, which causes that inhabitants of this region are not so endangered with staying without work, are classified to these classes too.

DELIMITATION OF AGRICULTURAL AREAS

Delimitation of agricultural areas was based on the following features: (1) share of arable land in total area, (2) share of rural workers in total number of employed, (3) share of households supporting themselves on agriculture. Because of great correlation between features (2) and (3), only characteristic (1) and (3) were considered in further calculation—as they turned to be related the least.

In 2003 arable land took up over 58% of country area (Figure 8). Share of arable land in particular regions of Poland varies a lot and is the result of many factors (Figure 9). It depends mainly on former socio-economic development in various historical periods in different parts of the country and as well as on the rate of usefulness of environmental conditions for the needs of agriculture (Bański 1998). Among others these elements caused that Żuławy, Małopolska and Lubelska Uplands as well as Śląsk Lowland are the areas with the highest share of arable land in Poland.

Agriculture was this branch of economy that incurred huge costs of the transformation in the 1990s. It was the time when economical conditions of agricultural production got significantly worse, which undoubtedly influenced the decrease of this sector's participation in Polish GDP as well as incomes in rural households. In years 1990–1999 farmers' incomes became smaller by 15% while workers ones rose up by 14% (Zegar 2001).

However, in some areas of the country incomes from agriculture are still for many families the main sources of maintaining (Figure 10). Such situation occurs mainly in eastern part of Poland, Kujawy and Wielkopolska regions. In the former it is related to the lack of clear alternative for agricultural production. Economic potential of the region is too low to generate non-agricultural jobs. In turn, the latter situation concerns highly specialised production that brings remarkable benefits to the owners. Over 85% of families that support themselves on agriculture obtain their income from work in their own farm.

On the basis of two aforementioned features and the method described at the beginning a so-called agrarization index was worked out. The rate points out regions where agriculture plays an important role because of space management as well as employment and inhabitants' income. The highest values of the index (class I and II) are characteristic for eastern and central Poland—especially peripheral areas of Mazowieckie, Łódzkie, Lubelskie, Kujawsko-Pomorskie and Wielkopolskie voivodeships (Figure 11). The lowest

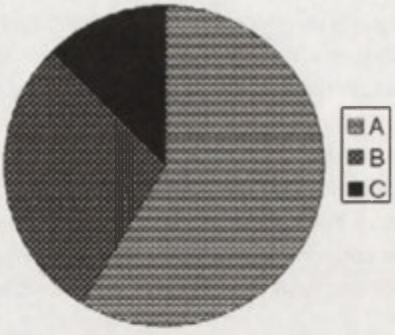

Figure 8. Structure of land use in Poland, 2003.
A—agriculture land, B—forests, C—others

values, in turn, are typical for separated urban counties, Upper Silesia region, mountain areas and densely forested parts of Pomorskie and Lubuskie voivodeships.

Described index does not include qualitative features of agriculture such as extensiveness, productivity, size of the household, commodity or usage structure as it was not the aim of this measure. Detailed description of Polish agriculture diversification because

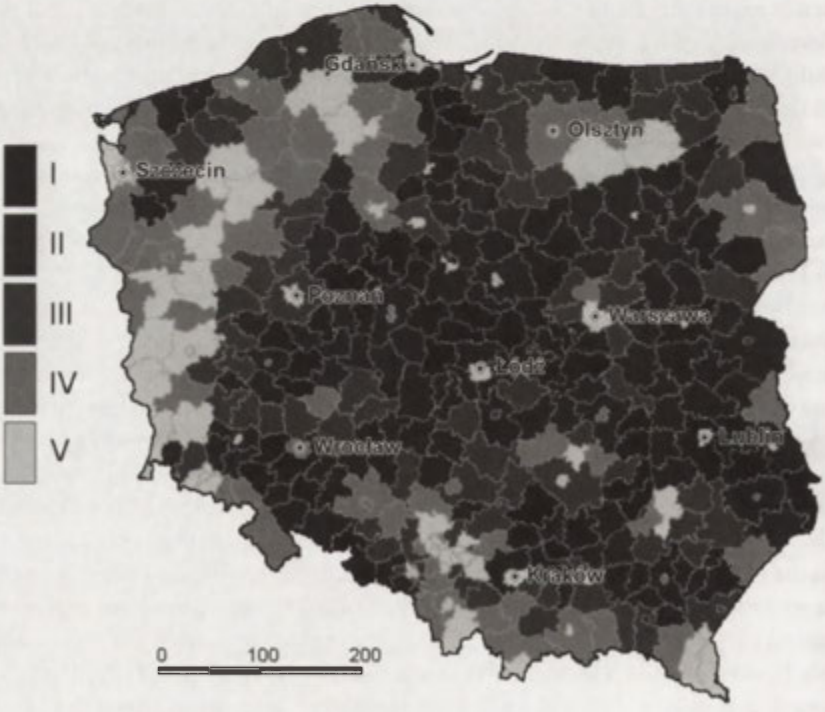

Figure 9. Share of agriculture land in total area of counties, 2003

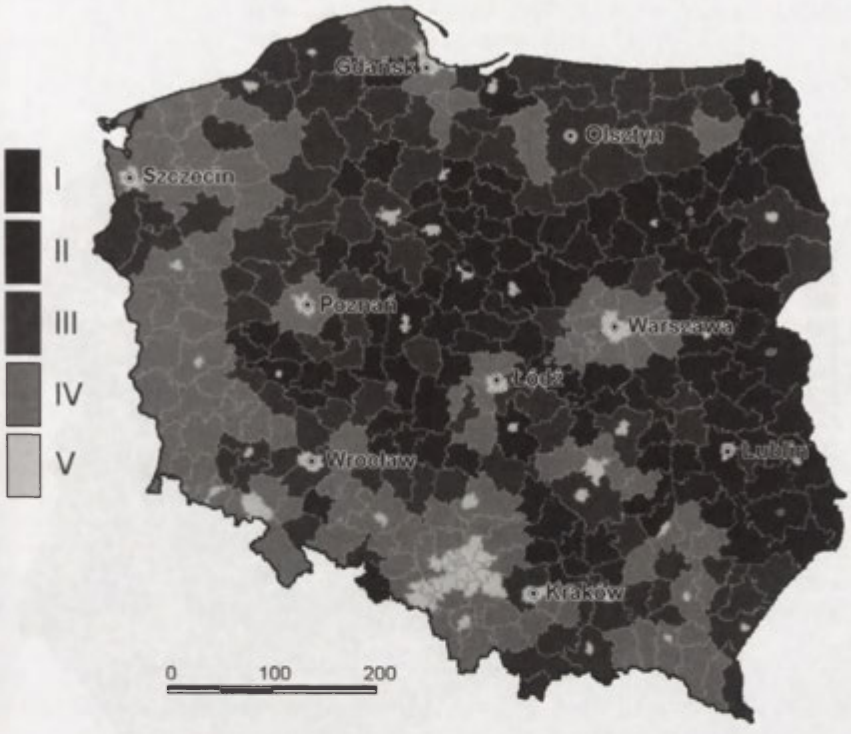

Figure 10. Households supporting themselves on agriculture, 2003

of aforementioned features can be found in many other papers: Szczęsny and Szczęsny (1996), Bański and Stola (2002), Ciołkosz (2003), Kulikowski (2004), Stola (2004).

AGRARIZATION INDEX AND SOCIAL EXCLUSION

Comparison of spatial diversity in terms of two features: social exclusion caused by unemployment and agrarization shows their co-occurrence. Social exclusion rate reached the highest values in the first class of agrarization index (Figure 12). In classes that characterise areas where agriculture is less important a remarkable decrease of agrarization index values is observed. Value of the described rate in the class I equals 144% of that in the class V.

There are some reasons of such unfavourable for agricultural areas relations. Unfavourable demographic structure, lack of alternative sources of income for farmers, lack of strong, able to provide jobs urban centres in eastern part of Poland, lack of developed small business or undeveloped infrastructural network are among them. However, weak socio-economical potential of agricultural regions should be recognised as the most im-

portant. Detailed analysis of development possibilities in dependence on given rural area function was worked out in another paper (Czapiewski 2004).

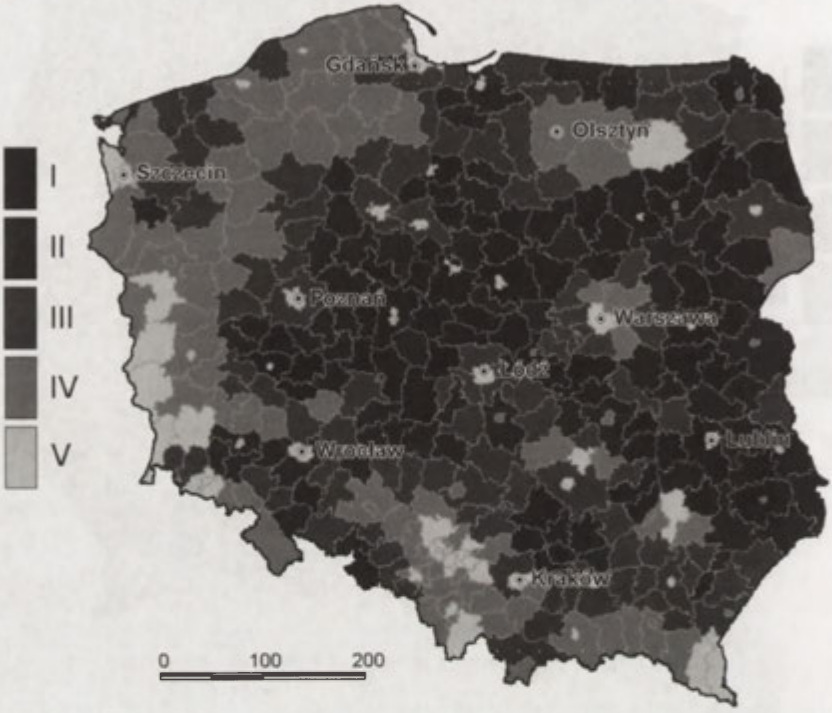

Figure 11. Counties by agrarization index intensity, 2003

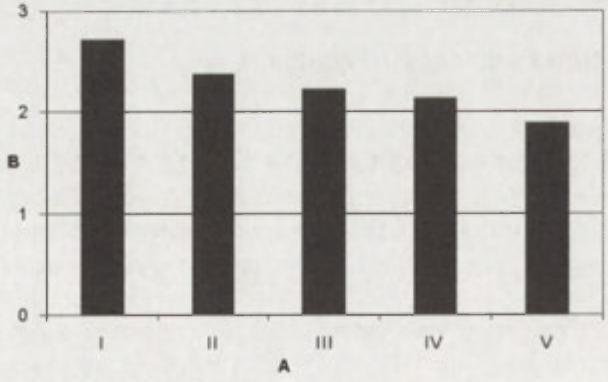

Figure 12. Social exclusion rate values in relation to agrarization index.
A—agrarization index classes, B—values of social exclusion rate

CONCLUSION

Social exclusion caused by unemployment has been affecting inhabitants of Poland for 15 years, although its intensity is various both in time and spatial dimension. System of unemployment elimination assumed mainly passive methods, there was only a few active proposals. In 2003, for example, only 4% of registered unemployed finished trainings and only 0,2% got loans for opening their own activity (*Informacja o stanie...* 2004).

The unemployment and related social exclusion are characteristic for people with low qualification (lower-secondary or vocational education) that live in areas perypheric to big cities and have no work-experience (e.g. graduates). These people are in the most difficult situation at the labour market and reasons lie both in individual's features as well as in geographical location of their home-localities. The fact that 80% of registered unemployed do it again proves how difficult it is to leave such adverse situation.

The paper aimed to analyse spatial diversity of social exclusion caused by unemployment. Carried researches allowed to define the most endangered areas. In vast majority there are agricultural areas of eastern and central Poland as well as some areas where socialist economy in agriculture was carried out during last 40 years. Cities and economically developed areas of western Poland were classified to the group with low level of social exclusion.

The research showed the need of carrying complex analysis that examines simultaneously both quantitative and qualitative character of phenomena. The unemployment seen only from quantitative perspective is one of the most important problems in northern and western Poland. However, as far as qualitative aspect was concerned, huge problems with long-term unemployment in eastern Poland could be clearly seen.

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SMALL TOWNS AS CENTRES OF RURAL MICROREGIONS

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IMPORTANCE OF SMALL TOWNS IN THE MORAVIA SETTLEMENT SYSTEM

A relatively low attention is paid to small towns in the geographic literature. Some exceptions confirm the rule: Laborie (1997), Rodriguez-Gonzales (1997), Munduch and Spiegler (1998), Sokołowski (1999), Niedermayer (2000), Žigrai (2000), Slavík (2002), Łoboda (2002), Zsilincsar (2003). It is clear that the decisive events usually take place in metropolitan and large cities, where particularly quaternary functions are concentrated. The decisive industrial activities, profiting from advantages of concentration, have been massed recently in large and medium-size cities and the population finding job opportunities has migrated here as well. But the technological procedure has modified the current urbanization processes. The number of inhabitants living in large and medium-size cities drops in the nearly whole Europe, industrial activities are relocated and their development importance is reduced. The people use passenger cars for transportation more and more which facilitates their dwelling outside the borders of large cities.

The facts above open a new view of the role of small towns in the settlement structure. The grant project of the Grant Agency of the Academy of Science of the Czech Republic No. IAA3086301 has set the task to study the role and its development thus trying to diminish this gap in the geographic knowledge of the current reality. Within the bounds of the works done till now several current and prospective functions of the small towns in the Moravia settlement system have been identified (Vaishar, Kallabová and Trávníček 2002; Vaishar 2003; Vaishar, Kirchner and Lacina 2004 among others). Taking in view common historical traditions, the issue most probably concerns all regions where the phenomenon or small towns is explicit enough. We are speaking for instance about the post-socialist states of the Central Europe, the Alpine region, southern France, inland Spain and other regions.

The role belongs among the functions above. On the basis of results of the latest census of population, houses and flats in the Czech Republic (2001) the population is broken down by the municipality size categories as follows:

Table 1. Share of Inhabitants in Municipalities of Individual Size Categories (2001)

Category	Inhabitants total	Share [%]
0–1 999	2 672 825	26.0
2 000–19 999	2 983 560	29.0
20 000–99 999	2 489 927	24.1
100 000 and more	2 146 621	20.9

Source: Census 2001, ČSÚ Praha (Czech Statistic Office)

If we identify (with certain reservations) individual size categories with rural communities, small towns, medium-size and large cities, we can establish that the highest share of Czech inhabitants live in small towns and their share in the population of the country has increased moderately since 1991. It means that small towns represent the alternative dwelling environment and the way of life for a greater part of population.

But this is not the sole role of small towns. The small towns represent an important localization factor of production activities layout. Though the employment rate in production branches has dropped substantially in small towns in favor of tertiary activities, the share of industrial employment is the highest one in small towns. Industrial companies, except the high tech branches, will most probably be located just in the small towns in the future. Small towns can play an important role in the process of globalization. Taking in view the traditional way of life, they are somehow more resistant to penetration of globalization trends and thus can become the holders of the regional identity. This function could be taken from the aged villages losing their own activities and becoming the pure lodging houses and sanctuaries of pensioners.

The central role of the small towns towards the rural hinterland is very likely the most important role of small towns in the settlement system. Small towns grant job opportunities to its rural hinterland, the basic level of urban services, the potential of social contacts and also the transport contact with greater centres as a rule. This way they enable to keep the rural settlement in marginal regions, which is very important for maintenance of the rural landscape and prevention of a too high concentration of the population in the inland regions of the country. The central function also becomes one of the criteria of the city/town definition. We can have explicit doubts that the towns without the catchment areas are full-bodies towns.

This paper has set the goal to evaluate the knowledge of realization of the function above gathered till now on the example of small towns in Moravia and the Czech part of Silesia and on selected examples.

FORMING OF CATCHMENT DISTRICTS/AREAS, ADMINISTRATIVE CHANGES

The catchment areas of the towns took their shape on the basis of the market function in the Middle Ages. Whilst the administrative bodies were accommodated in the castles, small towns, the manufacturing structure of which did not differ from villages too much, were established and spread round the castles. The right of trading granted by the owner of the region as a rule represented the main difference. The catchment district size had to correspond to the walking availability from adjacent villages and distribution of agricultural excess on the wagon/cart during a day, if possible. This fact gave the rise to a relatively dense structure of Central European cities.

Photo 1. Dačice (population 8,000): the historical part of the physical structure. Sight from the St. Lawrence Church tower. Convent of Barefooted Carmelites with the St. Anthony Church in the background.

Differentiation naturally took place in the set of small towns during the centuries. Certain towns also obtained other functions in the course of time—administrative, cultural, industrial (later on)—the number of inhabitants went up several times and the towns turned into medium-size or large cities. Other towns remained small towns, though the number of their inhabitants also went up during the demographic revolution. During the capitalist industrial revolution the industrial production localized in towns became the main town-forming factor. The towns granted particularly job opportunities. Their dense network remained preserved, because the employees went on foot to work. On the other hand, the goods had to be transported to greater distances, the local markets become national and the surplus of concentrating and specializing agricultural farms were distributed in the regional scale as a minimum.

But development of individual transport enabled to overcome longer distances to work, for services and other activities and micro-regionalization was defeated step by step in advanced countries. It was more advantageous for the inhabitants to travel to

a larger city, though distant, but offering a wider spectrum of miscellaneous activities. This was valid only for well traffic-available areas, particularly in the central regions where the small towns began to lose the central function. In the marginal regions off the main roads the small towns still kept their role.

Photo 2. Jablonne nad Orlicí (population 3,100): the square. A well-kept place with remainders of original architecture. Individual transport presses the greenery also in small towns.

In the socialist countries structure of small towns was preserved to a relatively high degree. In order to level the living standard, the social resources were re-allocated in such a way that important production activities were localized and housing construction concentrated even in small towns. Public transport played the primary role in the traffic connection; the public transport which was directed to the nearest centres, i.e. the possibility to select a more distant target was limited for the inhabitants. Therefore the problem of small towns in post-socialist countries is most probably comparable with issues of small towns in the marginal regional of Western Europe.

Release of market mechanisms in the 90th of the last century took place under other demographic, technological and global conditions, compared with the Western Europe some 50 years ago. The western European model cannot therefore be simply applied to the future development of the central role of the small towns. The number of inhabitants in large and medium-size cities drops, industry is no more the decisive branch, the market becomes global and the information technologies enable continuous contact with any place globally. We can therefore assume that shaping of catchment districts of small towns will be modified to a certain degree. The level of modification will be subject of further research.

The central role of small towns is also affected by the changes in the method of the state administration. It is evident that the rural settlements losing their production base step by step are unable to fulfill more and more demanding state administration tasks

satisfactorily. Therefore the state administrative was concentrated in larger units in a majority of countries. The process was also running in the 70s and 80s of the 20th century in the former Czechoslovakia. In the first euphoria of the 90s even the smallest settlements were given the possibility to be separated from larger units. Problems of this process were

Photo 3. Luhacovice (population 5,600): centre of the largest Moravian spa resort.

revealed soon afterwards. Beside evident limitations following from the limited financial and human resources, small settlements will also be unable to reach the European Union funds. It is necessary to await new re-concentration trends which will not necessarily result in loss of self-governing independence of small municipalities. It can be the matter of voluntary association and transfer of administrative powers. It is clear that small towns will become the crystallization nucleus of re-concentration in most cases.

Small towns were defined in our research also from that point of view that district towns were excluded. Within the bounds of the territorial administrative reform the district authorities were cancelled in the Czech Republic in 2003. One part of their powers was transferred to the regional authorities. Another part, particularly that part requesting participation of the population, was transferred to the selected town authorities able to provide the professional apparatus for exercise of administrative functions. These town authorities are not superior to the municipal authorities in their catchment area, but provide certain functions for them—where conditions for their realization cannot be created for by the municipalities. This way approximately one third of the small town set has obtained a new central function in the Czech republic.

METHODS OF CATCHMENT AREA DELIMITATION

Administrative function, commuting to work, commuting to services and perception of the population are the most frequent methods applied for delimitation of the catchment areas.

The administrative function seems to be the most suitable function for these purposes, because it is defined precisely. Two problems can be found here. There are more administrative activities and their territorial areas are not determined precisely in all cases. The more serious problem is that, based on the experience of delimitation of the catchment areas both under socialism and in the post-socialist period, a number of effects and factors play role which have nothing to do with the real catchment areas of the centres.

The first results have shown that the situation is distorted mainly in hinterland of large cities where the gravitation force of small towns with the administration function is usually overlaid by catchment importance of large cities. In the lowland regions, which large settlements are typical for, the adjacent settlements used to be equal by size. If one of such relatively equivalent centres is selected the administrative centre, its administrative catchment area has a high number of inhabitants, whilst the real catchment flow is very low. Therefore the borders of the administrative districts must be corrected by the real catchment flow towards other central functions.

It is quite evident that the requirement that administrative districts of individual centres shall correspond to the objectively existing historically created regions is unreal. The objective regions differ substantially by their size. But violent change of the catchment relations towards the quite opposite side should not take place. Connection of several small natural regions belonging to one larger centre or, on the other hand, division of too large regions into natural sub-regions with the centres in adjacent areas would be optimum.

Repeated analyses of the catchment areas of commuting to work in the socialist period have revealed that these areas are relatively stable. The conditions have changed substantially since. The method of transportation has changed, the weight of individual sectors of the national economy for the employment rate has changed and certain (even large) companies have disappeared and certain new ones have been constructed. Therefore we await results of the census 2001, which should be available this year in the sector of commuting to work, with impatience.

Commuting to services was also worked out in the 80s of the last century. The situation was simpler at that time, because in a number of cases (school districts, health districts, post districts, etc.) the catchment areas were determined centrally and were of rather administrative character. Commuting to other services was established by the questionnaires distributed to the municipalities. Nowadays the situation is complex on the one hand and substantial changes can be awaited on the other hand. Under the most important we can understand the fact that in the sector of retail and similar services the inhabitants do not satisfy their needs in the cities, but in hypermarkets constructed close to highways and important roads.

Establishment of perception of the central role by the inhabitants seems to be relatively stable. Identification of 'their' town by the rural population could determine the catchment areas with the maximum precision. The inter-settlement relations created the whole centuries which are not subject to boom deviations easily, could be reflected in it. Practical difficulties of application of this method are quite evident.

The delimited catchment areas of the small towns can be characterized by a number of indicators. Let us name the number of inhabitants of the centre, the number of inhabitants of the hinterland and their mutual relation, the number of municipalities and the

number of settlements in the catchment area, the average size of the settlement, centre to the second most densely populated settlement size ratio, catchment area size, density of population, distance of the most distant settlement from the centre on the road, etc.

Photo 4. Holesov (population 12,400): due to the population ageing, houses for seniors are often among the most modern buildings in small towns.

SIGNIFICANCE OF SMALL TOWNS FOR THEIR CATCHMENT AREAS AND FOR CATCHMENT AREA TYPES

The set of small towns is differentiated considerably. This also concerns their catchment areas, their size, shape and inter-settlement relation intensity. In principle the type of settlement in the region in question counts mostly.

A specific settlement structure affected by the processes of sub-urbanization and urban sprawl appears in large city hinterland. Small town in these locations are also the integral part of the processes above. These cities either do not create the catchment areas or their catchment areas are concealed by the gravity force of a large city. Šlapanice u Brna can serve as an example, where the municipal authority (and/or one part of it) is located in the centre of Brno which is available better for the inhabitants of the Šlapanice catchment area. Tišnov represents a quite different example—it is the centre of the marginal region contacting remote parts of three districts. The inhabitants of the major part of the catchment area can reach Brno most advantageously through Tišnov, i.e. Tišnov can offer the service 'on the half-way'.

The situation in the Ostrava hinterland is quite different. It the former mining and metallurgical region the settlement structure was formed in a different way. Job opportunities were not concentrated in the centres, but were spread in the landscape. The mosaic of individual mines, miners' settlements (housing estates later on), dumps, technical infrastructure, etc. has appeared which re-modeled the original settlement structure,

based on the system of small towns, substantially. Small towns of the Ostrava region have practically lost their catchment areas, but in a number of cases the small-town physical structure has been preserved surprisingly (Brušperk, Klimkovice, Hlučín and others).

The settlement structure, based originally on the system of large villages (certain of them obtained the town statute after some time), has appeared in the rich and well traffic available regions of the Moravian valley basin. In a number of cases the small towns are located close to each other (e.g. the region between Bzenec, Vracov, Strážnice and Dubňany). Large villages in the region have their own services, job opportunities and other activities which do not differ much from the offer of adjacent small towns. Moreover, larger cities are available relatively easily on dense and high-capacity roads. The central role of small towns is limited principally or is practically zero in these territories.

By marginal regions we can understand in the Moravian conditions the majority of regions along the state frontier, incl. the historical land frontier with Bohemia. Remoteness of these regions is connected not only with the barrier of the state frontier and distance from the central regions, but in the majority of cases also with the rugged landscape making traffic availability of the territory more complex. In addition to it, the so called internal periphery represented by highlands does exist in Moravia. Such regions can be surprisingly sometimes found only some tens of kilometers from large Moravian cities. In the case of Brno the marginal region starts roughly at the distance of 25 km in the northern semicircle round the city.

In remote regions the central role of small towns is of great importance, just because large cities are missing here and therefore the small towns are forced to take certain functions of them. In such cases the internal market of the small towns is extended naturally by the market of adjacent small villages having no significant facilities and amenities, in some cases the amenities are missing here at all. The catchment area size of such small towns is different, it can include even fifty rural settlements and the total number of inhabitants can be twice or even three times higher than the number of inhabitants of the relevant town. The number of inhabitants of the catchment areas of the small towns in the marginal regions can grow in many cases due to recreational use. In the mountain locations the number of inhabitants can grow due to summer or winter holidays, around large cities—due to short-term cottage and weekend house recreation of large city inhabitants.

There are of course also transient forms, e.g. in the contact zones between lowlands and highlands. The small town is usually located in the more advantageous position in the lowland where it cooperates with the adjacent towns and villages and catches more rural settlements from the adjacent highland. The shape of the catchment area of a such small town does not remind the Christaller hexagon, but the spherical circle in the direction from the highland.

The catchment areas naturally have their own internal structure. We can differentiate at least the settlements belonging to the given centre in the majority of its functions and the settlements which are caught only by certain functions or only partially. There are several examples of the situation above. Either a large rural settlement is located in the hinterland which offers certain services to its inhabitants, i.e. only the remaining functions have to be satisfied by the micro-regional centre. Inadequate facilities and public utilities of the micro-regional centre itself can be shown as another example, i.e. the inhabitants

of its hinterland are forced to satisfy their requirements for certain functions in a more distant, but a better equipped centre. And, finally, we can speak about the settlements located on the border of the catchment area which incline to more micro-regional centres.

Photo 5. Zamberk (population 6,100): prefabricated houses form a relatively important part of the dwelling stock also in small towns in Czechia.

ASSUMED DEVELOPMENT OF CENTRAL SMALL TOWN FUNCTION

Development of the Czech settlement structure will follow development of the settlement structure of the Western European countries to a large extent. The development will most probably be modified both by specific national features and by the specific features following from the heritage of the 40-year development under the centrally planned economy. The following fact can be considered an important factor: the market economy took place in the post-socialist countries only in the situation, where drop of inhabitants in large or medium-size cities and growth in rural settlements and in small towns is typical for development of the settlement structure. The words above do not mean at all that the process of settlement concentration is not running. On the contrary, this process is much more explicit, because the mechanisms leading to leveling of the conditions of living in the national scale are no more in force, together with the centrally planned economy. The market economy leads to quick extension of the differences between rich and poor regions which the still weak regional policy is unable to correct (neither partially). The trend to depopulation of the less economically developed regions and move of particularly young and educated people to the central regions follows from the situation.

This trend seems to strengthen paradoxically the central function of small towns in the marginal regions. Small towns in the central regions will become rather residential satellites of large and medium-size cities. The division of labor and thus small town specialization will most probably take place in the rich regions. Future of small towns in the

mining regions (recession of mining and heavy industry) can become an interesting problem. Can we await a certain revitalization of small town functions in these regions?

We can speak about the central function rather in case of small towns in the marginal regions. Deepening of marginality seems to strengthen the central role of small towns. Rural settlement will be more and more dependent on functions of small towns. The requirements for recreation and leisure time in relatively remote regions, untouched by intensive production, transport and other activities, will also grow. We can presume that the central role of small towns in the marginal regions will be relatively important even in the future and the issue is worth examining within the scope of the study of the settlement system.

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URBAN REGENERATION AND RESIDENTIAL MOBILITY IN BUDAPEST

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Key words: Budapest, urban regeneration, households, residential mobility, housing market

INTRODUCTION

Prior to the change of power the maintenance of the housing stock, owing to technological deficiencies, necessary renovation activities and reparation work were not carried out properly in the countries of East Europe, and in Hungary among them. Consequently, problems related to the built environment have stockpiled. As a result, quarters with dilapidated residential and building stock have competed on the housing market with a handicap, and this often coupled with the appearance of social problems.

Nowadays the cities of Hungary, and especially Budapest, are suffering from massive urban decline, deprivation and social exclusion which is mainly the result of a long lasting neglect of the building stock, the radical withdrawal of state from the housing market and the increasing social polarisation generated by the capitalist transformation of the economy. During the first decade of transition little or no attention was paid to the question of rehabilitation of deprived urban neighbourhoods, simply because other issues including unemployment or homelessness overshadowed the question of urban regeneration. Local governments and investors have faced complications as a result of the postponement of renovation activities so they recognized the inevitability of urban rehabilitation[1] and the opportunities the latter offers for architecture, economy and society. Urban rehabilitation makes an essential impact upon economic and social processes.

The present study outlines the state-of-the-art of urban rehabilitation in Hungary and the impact of urban renewal upon residential mobility. Actual trends and characteristic features of urban rehabilitation closely related with residential mobility are presented

[1] The term 'urban regeneration' is not widely applied in Hungary yet, therefore 'urban rehabilitation' will be used in the article as well.

by surveys conducted in case study areas on the territory of Budapest. There is an overview of changes having taken place on the housing market and housing conditions since the change of power, of indicators and factors affecting residential mobility, experience gained in the course of urban regeneration and of impact of the latter upon residential mobility.

THEORETICAL ASPECTS OF URBAN REGENERATION AND RESIDENTIAL MOBILITY IN HUNGARY

URBAN REGENERATION

Evolution and significance of urban regeneration

In the evolution of urban rehabilitation a decisive period was the one following World War II. This time can be characterized with repeatedly changing policies of urban construction and rehabilitation all over Europe. Phases of historical development, the strategies applied and their trends are summarised in Table 1. In the last phase comprising the 1990s there were a gradual return to the policies seeking consensus and recognition of new issues and challenges that influenced urban strategies. This has led to the expansion of the theory of sustainable urban development, laying foundations for and setting objectives of urban rehabilitation activities labelled in the European literature as urban regeneration. This is a comprehensive and integrated approach and method aimed at the solution of the problems of the city and a sustained improvement of economic, physical, social and environmental conditions of the areas to be developed (Roberts and Sykes 2000).

How has the issue of the rehabilitation of urban quarters gained such a great importance? There are at least two explanations, one is from the architectural viewpoint and the other from the social one. During the previous political regime no consistent attention was paid to the renewal of quarters with dilapidated housing stock. Urban strategies often

Table 1. The evolution of urban regeneration

Period	Policy type	Strategy and orientation
1950s	Reconstrucion	Reconstrucion and extension of older areas of towns and cities based on a 'masterplan'; suburban growth
1960s	Revitalisation	Continuation of 1950s themes; suburban and peripheral growth; some early attempts at rehabilitation
1970s	Renewal	Focus on in situ renewal and neighbpurhood schemes; still development at periphery
1980s	Redevelopment	Many major schemes of development and redevelopment; flagship projects; out of town projects
1990s	Regeneration	Move towards a more comprehensive form of policy and practice; more emphasis on integrated treatments

Source: After Stöhr (1989), Liechfield (1992) and Roberts (2000).

controlled by political considerations mostly concentrated on the extension of the built-up area. This was especially the case with the first, 15-year state programme on housing construction launched from 1960, whereas rehabilitation of the inner city housing stock remained neglected. After the change of regime, involving the transition to market economy, flats in fairly good condition were privatized whilst the most obsolete housing stock remained in local government ownership (e.g. in the case of Middle-Józsefváros at Budapest). Beside the fact that in the long run the postponement of urban renewal leads to the devaluation of residential buildings and flats, nowadays this phenomenon causes troubles in housing management and creates budget problems for local governments (e.g. low residential mobility, maintenance of obsolete buildings). Dilapidation and urban decline as a rule results in social degradation of the area. Affluent and mobile people move out of the quarter and cheaper flats in bad condition become occupied by elements in lower social position. Eventually it leads to filtering down of the housing stock. This way postponement of urban rehabilitation triggers negative processes not only in the built environment but in the social milieu as well.

These processes appear simultaneously and in a closely interrelated manner, therefore they should be managed jointly because—as experience shows—social problems cannot be solved by measures of urban construction alone. Addressing social problems is indispensable due to the frequent phenomenon, when the rehabilitated neighbourhood is repopulated by social elements belonging to a higher status (gentrification), whilst lower class people move to other places. Naturally, problems are here to stay, they simply affect other neighbourhoods within the city.

Characteristics, problems and recommendations on urban regeneration

Of problems raised by urban rehabilitation ownership relations, strategies, financing and cooperation are to be discussed below.

Ownership relations make an essential impact on measures of rehabilitation. As a result of give-away privatisation the Hungarian housing market underwent profound changes (Kovacs and Wiessner 1995) (Figure 1). Events of the past 15 years or so have proved that privatisation was necessary for the capitalist transformation, since there was a substantial lack of capital in the system and a remedy was needed. At the same time rapid privatisation has had drawbacks of its own which could not be anticipated in the first half of the 1990s (a dramatically vanishing social housing system, problems emerging from mixed ownership in residential buildings). Recently it has become obvious that high ratio of public property is favourable for urban rehabilitation and large-scale projects. Public property mixed with private ownership and high ratio of private ownership have negative impact on the rehabilitation of larger sites and they allow rather small-scale projects or step-by-step urban rehabilitation. The previous act on condominiums also hindered the activities on rehabilitation: to take decisions a complete consensus of dwellers was needed which could not be achieved practically in condominiums with a high number of flats. A new law adopted in 2004 resolved this absurd situation.

As far as *financing* of the Hungarian projects of rehabilitation are concerned there should be referred the scarcity of local government sources. Until the change of regime such programmes were financed from governmental sources exclusively (and performed

by large state enterprises and companies managing real property of local governments), with no private capital involved. Nowadays governmental funds are only sufficient for initiating regeneration activities (Figure 2), local governments are interested in mobilizing as great amount of private capital for such purposes as possible with minimum expenditures. Presently urban rehabilitation is only conceivable with the involvement of private capital.

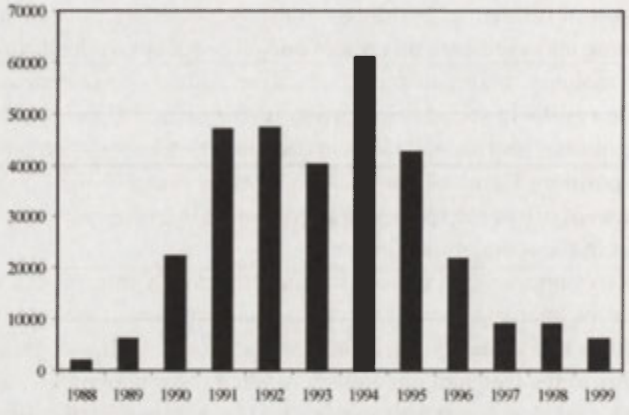


Figure 1. Privatisation of public dwellings in Budapest (1988–1999)

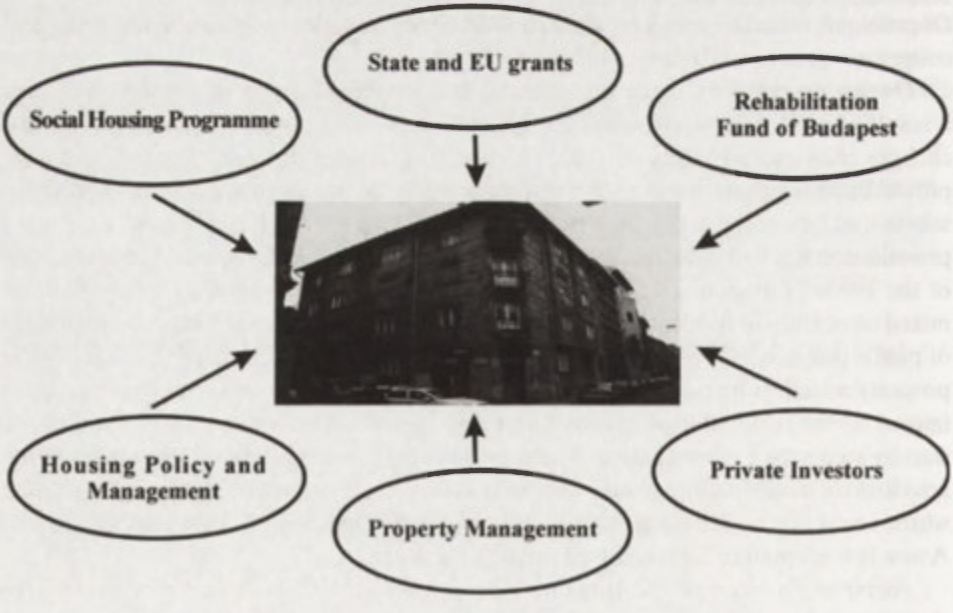


Figure 2. Possible resources of urban regeneration in Budapest

Because of the scarcity of funding local governments with meagre financial means should draw several sources and they better not minute them but concentrate on a single area of action instead. Actual trends of the housing market are to be taken into a due account. If local governments do not adapt to the housing market, they can lose their own property through the financing the deficits of social housing stock. As far as financing is regarded a further problem is that social balancing and supporting system of rehabilitation has not yet been elaborated in Hungary.

Concerning the *strategy* it must be stated that for the time being no comprehensive urban rehabilitation strategies are practised in Hungary. They must be worked out on the national, regional and local levels. Naturally, different conditions require different strategies. So decision makers, taking into consideration the endowments of the area and local conditions, eventually should make their choice on the implementation of either a 'microproject' or a 'megaproject'. Another viewpoint is retaining original building and architectural conditions. Balancing different interests of actors appearing during the rehabilitation and synchronisation of goals and possibilities are also necessary. The implementation of projects is subordinated to strategic objectives taking market conditions into consistent account also corresponding to the requirements of townscape preservation and urban planning and seeking for a state of equilibrium adapted to economic, social conditions and to forms of ownership. The urban rehabilitation creating this equilibrium is very important because urban development meeting all the requirements is feasible only through harmonising activities in renovation of buildings in private ownership and condominiums, rehabilitation of houses in local government ownership and real estate development financed by private investors. This can be achieved through scenarios featuring pacts and agreements resolving conflict situations between the actors, taking into account spheres of interest and power relations.

For the sake of a successful rehabilitation a wide-ranging and efficient team must be organised. Establishing an independent organisation concentrating all necessary means of rehabilitation in one hand can be very useful. It can take out some responsibilities from the realm of party/municipal politics, and delegates them to a more neutral actor, the more economic orientation can generate more revenue for the municipality and it helps to separate, at least for a while, the money designated strictly for the rehabilitation, and hinders its mixing up with the municipal budget. Cooperation is hampered by responsibilities and financing falling under the competence of different ministries and authorities thus complicating the process of rehabilitation. That is why institutional and organisational restructuring is necessary. Improving activity and participation of local residents and organisations is a very important aspect also because activity and assertion of interests of the population and civil organisations are on a low level traditionally.

As regards *social aspects of rehabilitation* it should be mentioned that in an optimal case we need exact information about social consequences already before starting the project. Regretfully, municipalities in Hungary as a rule do not possess information on the expected effects of the renewal. Social processes are not monitored and measurements of social impact are not carried out. Nevertheless, they are necessary because usually rehabilitation is followed by considerable population exchange. In order to be upgraded a neighbourhood needs this transformation of social pattern, but it should be

a slow and gradual process. A highly expensive phase is resettlement of tenants during rehabilitation and municipalities in most cases are not able to make it on their own bases. Currently there is a hidden exchange of population in Budapest, district municipalities frequently purchase real estate on the territory of each other to resettle former tenants and this might 'export' social problems. This is an indication of rehabilitation destroying former communities. From the side of the population a better housing situation, new environment and local community require stronger adaptation in order to avoid social tensions in the new neighbourhood.

RESIDENTIAL MOBILITY

Changes in residential mobility is an important parameter of how the housing market operates and its study is an integral part of the survey. A high residential mobility lies in the foundation of an efficient housing system, because low mobility assumes tensions on the side of demand or supply, when households are accommodated in flats which do not correspond to their opportunities, expectations and necessities. According to an other concept, however, low mobility can be an outcome of balanced, mature processes on the housing market, of a situation when broad strata of society live in apartments meeting their requirements, the majority is satisfied and the mobility has been reduced. Knowing the conditions both in Europe and Hungary, however, the latter case seems to be an utopian idea so far.

Generally studies on residential mobility are aimed at investigations into a) decisions taken on resettlement, when it is regarded as a response to stress factors related with the present dwelling, b) impact of resettlement on the household as a rule identifying social and psychological consequences inquiring about satisfaction and changes in quality of life (Speare et al. 1975). Thus residential mobility can be conceived either as a response to stress factors or as a potential source of stress.

Factors affecting residential mobility

A focal point of studies on housing market are investigations into *life cycle of the families* providing explanation for several processes on the housing market. With their help changes taken place within the family's life cycle can be modelled plausibly, i.e. how should housing consumption be adapted to changes in the composition of families and what kind of effects might have these processes on housing mobility? In a balanced and working housing system and market these two processes (changes in family life cycle vs housing consumption and construction)—which can be labelled sides of demand and supply—are in harmony i.e. they are adapted to one another even though with minor fluctuations (Hegedűs 2001).

Size and composition of the family and household also have an effect upon housing consumption as there are different expectations and requirements toward a single household compared to those with two children or multi-generation households. In this respect there are considerable disparities between the households with young or elderly populace. Mobility reaches its maximum among young adults; big families and households promote it whilst the presence of little children is a factor hindering mobility (Long 1988).

Changes in the walk of life of the family members also affect mobility as an individual occurring on a different income level or in another age group is likely to change his/her

order of values, new priorities can come to the fore after decision on moving (Mulder 1993). *Financial situation of households* makes a strong impact upon transactions and movements within the housing market and, consequently, upon mobility. This is an especially remarkable phenomenon as both employment and material conditions of households have undergone profound transformation since the change of regime. The process of polarisation in society have affected the middle strata adversely: most of these people have gone bust and degraded along the social ladder. They cannot afford themselves to enter the housing market. The gap between the richest and poorest has been widening continuously, and nowadays one of the most sensitive indicators of disparities in well-being is the capability of entering the housing market.

Employment relations and labour market situation are closely related with material consolidation but they affect residential mobility in themselves. Post-modern society requires a higher mobility of manpower and there has been an increase in the number of professions demanding long-distance movements or change in the place of residence. Simultaneously, following the change of regime and owing to the emerging threat of unemployment, professions granting a stable labour and safe job have been upgraded and for this reason the willingness of people to change residence has grown. Unemployment is a factor making a negative impact upon residential mobility. Unemployed persons move down on the housing market or after losing property they may drop out of the market.

Residential mobility is strongly influenced by the *attitude of people to their dwellings that of the households to real property.* For long decades real estate had been considered a reasonable investment without risk and with a highly stable or rather increasing value. As time was passing, families put an aim to purchase an apartment of their own, in order to possess and accumulate material wealth. This attitude is deeply rooted and still survives on the housing market. Residence has been something to live for and is viewed as a kind of the most secure investment (see portfolio theory). By now a vast majority of residential properties have lost this role and market supply exceeds solvent demand considerably. The above processes however have greatly contributed to sustained low residential mobility.

Concerning the major factors of the housing market it should be mentioned that they can be also affected by the *processes taking place on the local housing market, purposes of the main actors* of the whole market and by the *system of taxation.*

Key indicators of residential mobility

Several indicators seems to be suitable for the measurement of residential mobility or for drawing conclusions on its level.

Of them the most commonly applied one is *mobility rate*, i.e. households changing residence as percentage of the total number of households. Based on domestic surveys published its value is very low in Hungary and is estimated between 2,5–5,0 per cent. Though there are considerable differences of this indicator value in the Western European countries, they are higher almost everywhere.

As residential mobility is regarded further useful information can be obtained from the *number of dwellings*, i.e. that of occasions of changing dwellings by the household (family, person) in concern. Age of the persons affected, type of settlements are to be

duly taken into account and also whether migration has involved change of settlement because these conditions can influence the value of this indicator thoroughly. Based on previous investigations this value changes between 2,5–3,8, depending on the type of residence and age of dweller(s). It can be stated in general that no substantial change could be observed above 50 years of age and the value tends to decrease along the county site–capital city–town–village sequence (Hegedűs 2001).

Age study is a decisive and indispensable part of investigations into housing market. *The age of young people leaving the home of parents, the age of entry to the housing market* (when one occupies the first residence of his/her own), and *average age of dwellers active on the housing market* provide relevant indirect information on residential mobility. Both the age of those leaving parents' home and the average age of the actors on the housing market had shown an upward trend from the 70s until the late 90s. The former had risen from 24.7 to 27.5 years, whilst the latter increased from 32.1 to 37.3 years. In the 90s the hitherto rigid housing system had shifted to a more flexible one in comparison with the previous decades. This transition to the market conditions, however, had proven to be unfavourable for the mobility of the younger generations as it is shown by the figures above. With the advent of restructuring on the housing market state subsidies vanished thus weakening the starting position of these age groups.

Furthermore, *moving from one type of dwelling to another one* and *type of the previous dwelling relative to its use after moving out* belong to the adequate characteristics of residential mobility. Since the 1970s nearly half of the movements has been represented by the same type of target residence (primarily detached homes and condominiums) and movements have been directed mainly to detached homes and condominiums. The use of residence after moving out allowed a conclusion that residential mobility had tended to rise somewhat, still it remained below the desired level.

PRACTICAL EXPERIENCES

CASE STUDY AREAS AND METHODOLOGY

In order to investigate the impacts of urban regeneration on the residenatial and spatial mobility we have selected four case study areas. Our case study areas were selected because all four projects offer different examples for successful local government initiatives. However, as in Budapest sharp differences can be detected between the inner and outer districts in terms of the age, physical conditions etc. of the building stock as well as the social and demographic composition of the inhabitants we divided our study areas into two groups: a) inner-urban high-density residential areas (Middle-Ferencváros and Middle Józsefváros; b) Initiatives in peripheral low-density residential areas (Kőbánya-Centre and Újpest-Centre) (Egedy 2004) (Map 1).

Middle-Ferencváros

The case study area is a typical late 19th century quarter comprising 4–5 storey tenement blocks, a socially mixed neighbourhood with inhabitants of lower middle-class and petit bourgeois character. Predominantly owner-occupation with sitting tenants is typical in

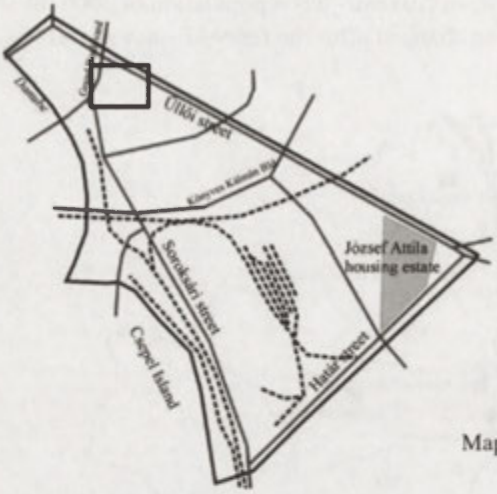
the neighbourhood. The case study area currently has a population of 3000 inhabitants. The population composition has been changed after the renewal—new social strata have moved in (Map 2).

Map 1. The location of case study areas

The Ferencváros project is the first comprehensive rehabilitation programme in Budapest and even in Hungary. It is an ongoing urban reconstruction programme together with physical rehabilitation of a former deprived inner city area. The programme started as a socialist large scale project during the 1980s and continued after a short break in the early 1990s. The rehabilitation process, which is a typical top-down project, was initiated by local government to stop physical and social decline in the area. The French SEM model was adapted for organising the process, the key institution of rehabilitation is the SEM IX. joint stock company. Most important impacts are an ongoing gentrification process with a social touch and a physical upgrading of the built environment, leading to a new social composition and social mix in the area (Photo 1).

Middle-Józsefváros

Middle-Józsefváros is located in the traditionally poorest district of Budapest with low quality tenement houses from the late 19th century (Map 3). The majority of the housing stock in the case study area (total 2100 dwellings) was built before 1960 and must be categorised as substandard flats. The majority of the dwellings could not be privatised and is still owned by the local district (municipality) and functions as a residual public housing sector. The case study area has 4700 inhabitants, the population is ageing. The area shows a high residential density with predominantly lower social class. A large part



Map 2. The location of Middle-Ferencváros case study area

of the local population belongs to the underprivileged and socially excluded ethnic group of Gypsies (Roma).

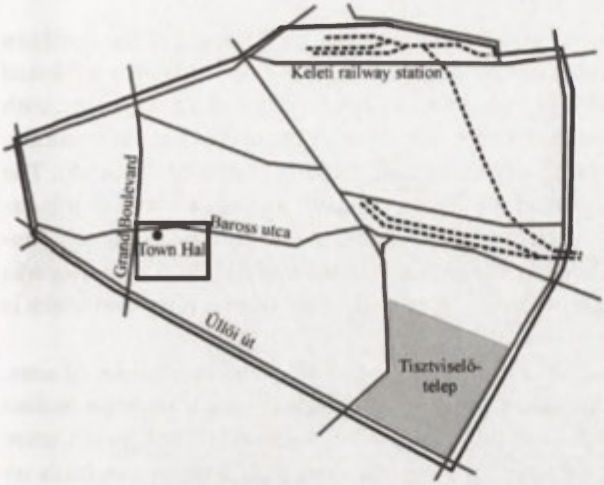
The local government launched a complex rehabilitation programme in order to stop physical and social decline and to improve the prestige of the district (Photo 2). The rehabilitation area is divided into two major action zones: one part of the area will be completely demolished and cleared and sites will be sold to private investors. Mainly from this income the other part of the area (late 19th century quarter comprising tenement blocks) will be rehabilitated, with a step-by-step method, so that the original tenants and home-owners remain in the buildings eventually. The leading agent in the rehabilitation process is the Rév8 Urban Development and Rehabilitation Co. The process is financed by the local and city government; and application for state resources is also possible.

Photo 1. Renewed late 19th century tenement block in Middle-Ferencvaros

Kőbánya-Centre

Kőbánya, as a typical working class district, was very poor in terms of living standards and the quality of the housing stock was well below the Budapest average. The ownership structure in the case study area is mixed with predominantly private ownership. The present population of the case study area (approx. 4800 inhabitants) can be characterised as ageing, with high ratio of lower class strata and a Gypsy minority.

The case study area called Ligettelkek co-incides with the district centre of a small town



Map 3. The location of Middle-Józsefváros case study area

Photo 2. New construcion in Middle-Józsefváros

milieu with eclectic and art nouveau buildings (Map 4). The project can be perceived as a combination of urban rehabilitation and social housing construction programmes aimed at combating the physical and social decline of a peripheral low-density area. There are two main aspects of the Kőbánya-Ligettelkek rehabitation process: the one is the development of a new social housing stock; and the other, the rehabilitation of condominiums and co-operatives. As one of the first steps of rehabilitation the 'Százlakásos'[2] project was completed, aiming at the construction of 100 new, high quality social rental dwellings (Photo 3).

[2] 'Szazlakasos' could be translated as 'Hundredflat' referring to the number of dwellings in the newly built building.

Újpest-Centre

Újpest (District 4th) is a traditional working class district of Budapest at the northern periphery of the capital with a strong industrial character. The case-study area is located in the central part of Újpest, which is a rather dilapidated, old residential quarter, with low-rise houses. Almost all the buildings here were built at the end of the 19th century, and they are rather obsolete now, with a predominantly elderly population (Map 5). The dwelling stock of the case study area shows all symptoms of ageing as well and it is extremely heterogeneous. The local society could be characterised by a relatively low educational level and a prevalence of blue collar workers. In the early 1990s the quarter was considered to be one of the poorest places of Újpest with many Romas (Gypsies) which is a clear indicator of downgrading.

The project can be characterised as a gentrification process with balanced social aims, linking urban rehabilitation with social housing programmemes to cope with urban decline and negative consequences of capitalist transformation of housing market. The Újpest-Centre initiative is a typical small scale, step-by-step programmeme, with a strong emphasis on active local housing policy and property management (Photo 4). This top-down initiative is a combination of an urban regeneration programmeme and social housing construction creating mixed tenure within the neighbourhood. The initiative can be characterised by co-existence and synergy of local resources and national programmemes.

Quantitative and qualitative methods were applied to investigate the processes has benn taking place in the case study areas described above (altogether 200 houshold questionnaires and 20 in-depth interviews with local experts were carried out).

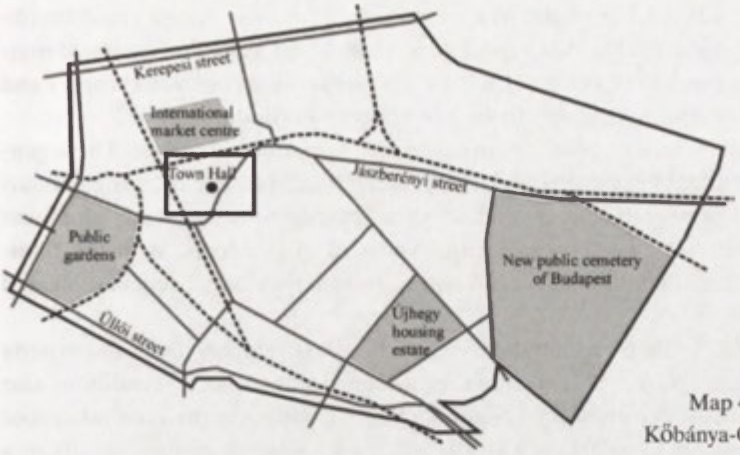
GENERAL FINDINGS ON REHABILITATION PROCESSES

Concerning practical experience of urban regeneration conducted in case study areas at Budapest it is to be emphasised that—in spite of the general belief—*urban regeneration initiatives can be carried out in Hungary without the involvement of huge financial assets*, and the success can be granted *by a step-by-step procedure*. Also by the majority of experts on urban rehabilitation microprojects in a smaller scale are more reasonable to implement. It is especially valid for the municipalities with scarce financial sources.

Ownership relations have a vital importance in rehabilitation. High ratio of apartments in public sector (social tenants) within a given area creates favourable conditions for rehabilitation making thus possible to plan and implement large-scale projects (e.g. Middle-Ferencváros, the Corvin-Szigony project in Middle-Józsefváros). At the same time a high rate of mixed ownership and overwhelming private property enable only a small-scale intervention and step-by-step approach to urban rehabilitation (e.g. in cases of Újpest-Centre and Kőbánya-Centre).

Linking urban rehabilitation and social housing programmes is a frequent practice of urban renewal in Budapest. It offers considerable advantage for the two processes can support one another and be complementary so that several problems are addressed simultaneously (e.g. Újpest, Kőbánya).

Among the positive achievements it might be mentioned that as a rule *partnership is established* between municipalities, their market organisations and representatives of private firms. This partnership sometimes yields a joint organisation (e.g. SEM IX in



Map 4. The location of Kőbánya-Centre case study area

Photo 3. The Szazlakasos building containing 100 new public flats

Ferencvaros, Rev8 in Jozsefvarosban, RPM office in Kobanya) emerging as a catalyst of cooperation and directing activities on renewal, also maintaining a close relationship with local population.

In our experience there are *key persons* (in municipalities, condominiums and in the local communities in general) playing an active part in local processes being their generators. It can be stated that rehabilitation is a much more efficient and smoother procedure in those neighbourhoods where such key persons overtake the tasks and responsibilities relating to rehabilitation.

Among the disappointing experiences of our survey in the first place should be mentioned a very *low level of participation* of the local organissations and residents, and quite often its complete lack. The reason for that might be twofold. On the one hand such a

behaviour has been inherited from the past even if some positive change could be observed in the recent years. On the other hand the activity of municipal officials and market actors also leaves much to be desired. Civil society is organised poorly in Hungary and its interest asserting ability is weak within the present market conditions.

Renewal of an urban quarter often entails a *massive population exchange*. These gentrification processes might be instrumental in upgrading social prestige of the neighbourhood. It should be remembered however that urban policy, regeneration and development are inconceivable without a comprehensive management of problems. With the resettlement of poorer strata the problems would not be solved, they only become relocated spatially.

No doubt, results of urban regeneration received *positive response* from the experts and local people. Beside the improvement of the built environment social conditions also change for the better. As the municipalities launching activities on the renewal earlier have certain advantage in comparison with the other ones and the process results in a series of proceeds. In the neighbourhoods where rehabilitation is inevitable steps should be made as soon as possible.

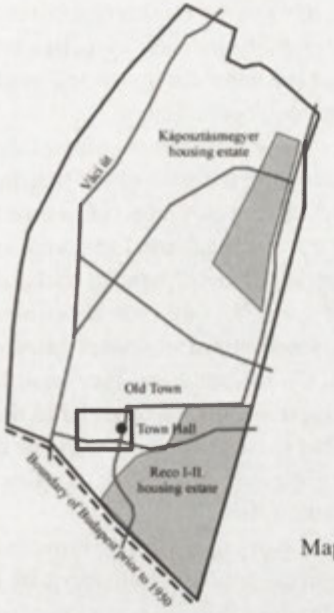
It has been proven that physical rehabilitation of a quarter in itself does not necessarily involves upgrading and progress of the area. Recent economic changes and the process of globalisation have led to deterioration of the economic, social and physical environment in many urban settlements. Socio-economic changes, however, occur much more rapidly than the physical ones therefore it is indispensable to follow these trends when conducting regeneration of the physical environment. *A genuine success can be achieved by a joint regeneration of the three systems of environment.* Besides, organisations participating in urban regeneration are gradually becoming aware of the multilateral character of the problem and realise that its solution rests with a strategically conceived and adequately supported mutual partnership of the different sectors based on local activities.

Comparing the domestic and international experience it can be stated that in Hungary and eastern part of Europe rehabilitation is generally conceived as the renewal of built environment. At the same time urban regeneration in the western part of the continent is viewed as a comprehensive and complex attitude and intervention aiming at the solution of the problems of the city, joint and continuous improvement of economic, physical and social conditions of the neighbourhood to be developed. Accordingly, rehabilitation of the built environment is accompanied with social and economic measures. In general, countries of West Europe excel in strategic thinking, with elaborated central governmental and regional strategies, higher institutionalisation, closer partnership between the actors of urban regeneration, a broad range of monitoring and analysis of the social impacts of projects.

PRELIMINARY RESULTS OF SURVEY

Main impacts of urban rehabilitation on residential mobility

Our research programme is going to terminate in 2005 and the evaluation of the results is under way. Still there are some findings claimed to be general, especially those relating to the impacts of rehabilitation upon residential mobility. The most relevant of them are the followings:



Map 5. The location of Újpest-Centre case study area

Photo 4. Brand new residential building in Újpest-Centre

Small architectural and physical environmental interventions have multiple effect on the quality of life and satisfaction of residents.—Concerning the measures taken by the local population or investors aiming at the improvement of the quality of life, it could be mentioned building-in balconies and terraces and shaping flower gardens within the living environment. Of the studied neighbourhoods it was Újpest alone where there has been an attempt to a positive turn of housing structure with balconies, terraces and small flower gardens around the renovated dwellings. Due to these changes a higher number of residents expressed their satisfaction with the physical environment in comparison with other case study areas.

Urban regeneration has a balancing effect on the housing market (consistency between financial and housing situation)—Residential mobility induced by urban regeneration leads to a shift on housing market in a sense that the population affected would live subsequently in apartments fitting better in their financial potential.

Together with the number of new dwellings, the number of respondents who say 'I am living in the adequate dwelling now' grows.—Examining the state of the housing stock (as the example of Újpest shows with a high number of new dwellings) allowed a conclusion that the higher the ratio of new apartments of the dwellings total the larger part of the new residents claim they are living in a flat adequate to their financial background.

By gentrification some higher status strata come to stay only provisionally to the neighbourhood.—As a result of gentrification social strata of higher prestige become represented increasingly in the neighbourhood. On the one hand they regard this living neighbourhood of better image just as a stepping stone, on the other hand they serve as catalysts for its rise and development. Behaviour of these newcomers might be decisive for the future of the quarter: whether they remain to live in the area after its renewal or move to quarters of higher status, perhaps to the suburban zone.

The behaviour of residents with low income and high property value is the most difficult to predict (filtering down or up?)—In case study areas people with inadequate income often live in dwellings forcing them to make considerable efforts to cover maintenance costs and it is uncertain if they would reside there in the long run. Their out-migration of the neighbourhood could raise residential mobility but it is not just the same who and which social strata the replacing in-migrants occur to be. Thus the presence of these strata within the neighbourhood might generate either positive or negative trends of development.

Gradual rearrangement of the social structure: growing number of higher status strata without rapid homogenisation process.—According to the interviewed persons in the case study areas (in consequence of urban renewal) the presence of people of similar status had grown whilst those of different status had been reduced. This trend by no means should be conceived as a process of rapid homogenisation (i.e. a massive inflow of population belonging to the same social strata) that might be expected by many. The phenomenon can rather be described by a shift of the social composition in the neighbourhood toward the strata of higher status not followed by a spectacular and rapid homogenisation of resident population. The effect of urban rehabilitation upon residential mobility (everybody lives in a more adequate dwelling in terms of his/her financial potential) is more articulated than its impact upon social composition (homogenising).

Interventions of the urban regeneration type as a rule reduce the dwellers' intention to move out of the neighbourhood.—According to international surveys one of the main triggers of resettlement is the (small) size of the current dwelling. This is closely related to the size of households and (indirectly) to ethnic affiliation, especially in the western countries. Other frequent reasons are high living costs, the physical state and safety of the environment, and problems within the family. In Hungary the acquisition of an own dwelling as a main object in life is added. Intention to move out is inversely correlated with the age of the person and directly correlated with the educational level and raising incomes of households. Elderly, socially and financially more stable and satisfied households show less willingness to move (Egedy 2003).

Perception of residents of social changes in the regeneration areas during the transformation

In the questionnaire as part of the survey the shift of social position since the change of regime (quality of life, state of health, income conditions, social relations, requirements) was asked. The responses from the different case study areas are summarised below.

Higher requirements of residents towards their dwellings and physical environment—Since the second half of the 80s—and particularly in the 90s—the importance of living environment has been enhanced when individuals and households were looking for a place where to live. Social strata have been emerging which are more sensitive to the quality of physical environment, partly because they can afford it. Due to social polarisation and segregation, quality of residential environment and satisfaction with it have recently undergone sharp differentiation. Higher requirements towards environmental conditions as a migration factor are less typical of cohorts of lower social status and poorer conditions of income. On the other hand, when the quality of environment becomes a primary aspect in selection of a new dwelling to move in, the households are going to choose their final residence or a least a place to live in the long run (Földi 2000). Our survey testifies to higher requirements to the environment and dwellings during the period since the change of regime. The answers received from different case study areas vary considerably. The newer and better dwellings the respondents live in actually, the higher are their requirements. Furthermore, residential environment has received an increasing significance in relation to the satisfaction with the dwelling.

Improved income situation—There has been a positive shift in the incomes of the population of rehabilitation areas since the change of power. Respondents reporting on the improvement of their financial situation outweigh those indicating stagnation or deterioration in this respect.

Minimal changes in social relations and general state of health—According to the questionnaires only minor changes occurred in the sphere of social relations and in state of health of the respondents during period of time that passed since the political changes.

Opinions about life quality changes vary—The most balanced proportions are reflected by the answers concerning satisfaction with changes in life quality. Responses, however, differ considerably (e.g. on social polarisation and its subjective judging by the individuals).

Positive correlation between perception of changes in social status and status of the neighbourhood—The ratio of respondents reporting about positive changes in social status as a rule is directly proportional to the status of the neighbourhood. In the traditionally ominous Józsefváros a vast majority claimed the social relations as deteriorating and a minority reported on positive changes, whilst in the case of Újpest-Centre (a neighbourhood on the rise and being upgraded nowadays) the picture was just the opposite.

CONCLUSION

In the present study the theoretical foundations of urban rehabilitation and residential mobility were tackled and the experience of the surveys conducted in Budapest was reported in detail.

It can be stated that urban rehabilitation has undergone organic development since World War II and along the path of reconstruction–revitalisation–renewal–development it reached urban regeneration by the 90s completing a comprehensive and integrated cycle of urban rehabilitation. In the course of the neighbourhoods it is indispensable to adopt an integrated approach because, as experience shows, physical rehabilitation of buildings and living environment in itself cannot guarantee a successful rise of quarters. That is why consistent emphasis should be put on economic and social integration of the area.

With the outline of current issues such as ownership relations, strategic thinking, partnership, financing, and social aspects it was intended to expose some critical features of the activities on rehabilitation and to promote domestic and international practice providing some additional information in the matter.

Residential mobility is affected by a lot of factors. Of them the changes occurring along the life cycle of the family, composition and size of the family and household, financial situation of the latter, employment and labour market relations, processes on the housing market and the taxation system should be mentioned as the most important ones. Besides, subjective factors also exist, such as the attitude of the individuals to dwellings and that of the households to real property.

Residential mobility can be measured both by direct and indirect indicators. The former comprise mobility rate, number of movements by households, whereas the latter are represented by parameters related to the age of actors on housing market, moves between the types of dwellings and to the type and subsequent use of the apartment left behind.

Analysis of case study areas, strategies applied in their rehabilitation and the subsequent processes in these areas have proven that no identical neighbourhoods exist and no uniform methods and models can be offered for the rehabilitation of urban quarters. Each project and every neighbourhood represent a unique and specific context of the environmental subsystems which makes drawing general conclusions extremely difficult. Consequently, a knowledge of local specific features, problems and opportunities has a great importance, and adequate means should be find for the satisfaction of local needs. On the other hand, social problems met in various neighbourhoods show striking similarities, therefore the objectives put by the initiatives, ways of thinking, working methods and the approaches to the problems could be applied in other quarters successfully. The most reasonable solution is to build a model of our own using the experience available from other projects via selection of relevant components and applicable elements.

Results of our survey suggest that urban rehabilitation has a direct effect on residential mobility and affects social processes. Besides, it has repercussions on the level of social consciousness which are difficult to measure and also those manifesting themselves very slowly and could therefore be recorded in the distant future only. It should however be remembered, that urban rehabilitation is very likely to remain a focal political, social and economic issue because after the change of the power the expectations and requirements of the people towards the living environment have grown and they are bound to be increasingly critical about the changes taking place in the neighbourhood.

A welcome and positive development is that the municipalities gradually recognise the necessity of rehabilitation of the obsolete neighbourhoods and of elimination of the

local social problems. Encouraged by the success of the earlier programmes on rehabilitation more and more municipalities work out and launch a project of urban renewal of its own. As the local governments already engaged in the process have advantage before the others and these activities have several positive side-effects, in the neighbourhoods where rehabilitation is an inevitable action, it is worth to make necessary steps as soon as possible for the renewal of living environment.

Results of urban rehabilitation achieved so far have met a positive reaction among the experts and population. Along with the transformation and improvement of the built environment i.e. the growing aesthetic value, attractivity of these places to live in and the improving quality of life of the residents, social environment as a rule can be characterised by positive trends as well.

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QUALITY OF LIFE AND URBAN SPACE (CASE STUDIES FROM CITY OF BRATISLAVA, SLOVAKIA)

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INTRODUCTION

Over the decades, the quality of life research efforts have been expanding in the developed world. In recent years, quality of life (QoL) issues have increasingly been the area of attention in newly industrialising and developing countries (Foo, 2000). Significant political, social, and economic changes and technological progress have increased an interest in issues relating to life quality in post-socialist countries. These changes with substantial impact on the quality of life considerably change the position of individuals in society. The issues of quality of life have been increasingly discussed in connection with the effect of negative life circumstances (diseases, economic and social difficulties) on individual situations of individual people or social groups (Dzúrová and Dragomirecká 2000). Consequences of such negative circumstances are also observed in post-socialist cities. The post-socialist cities can be characterised by a transitive developmental stage connected with dynamic changes related to the adaptation of intra-urban structures, and behaviour of urban population to new conditions (Matlovič 2004) and significant socio-spatial differentiation (Węclawowicz 2003). The base for the study of recent urban situation is the knowledge of the nature of socialist city. There is a rich source of urban geographical literature devoted to the socialist city of Bratislava (e.g. Bašovský et al. 1981, Bezák 1987, Ira 1984, Vereš ík 1970). There are some urban geographical studies, in which a background information for the explanation of changing urban environment of post-socialist Bratislava can be found (e.g. Bašovský 1991; Bučcek 1996; Ira 2001; 2003; Korec 2000; Korec and Smatanová 2000; Spišiak and Danihelová 1998).

The first aim of this paper is to address the key theoretical and methodological issues confronting quality of life research from a human geographical perspective. Another aim of the

contribution is to present two basic approaches employed to illustrate the application of 'the city on the ground' and 'the city in the mind' concepts in post-socialist city of Bratislava.

CONCEPTUAL APPROACH TO QUALITY OF LIFE

Over the past few years, discussions about the term 'Quality of Life' and the way in which it is applied and measured have slowly increased. Some criticism has arisen from the problems with quality of both research and application, some from misleading claims about outcomes and some from the lack of conceptual clarity. In relation to quality of life from the interdisciplinary point of view there is little agreement about the meaning of the term itself, there are rival schools each tendentiously urging the adoption of a different approach to quality of life.

Early studies of life quality were concerned mainly with defining the meaning of the concept. More recent investigations have advanced from definition of QoL to identification of the major components of the concept. There is no 'general agreement' on the components, which make up quality of life. There are in existence a number of models of quality of life, which are not in agreement about the structure of the concept (Marans 2003; Massam 2002; van Kamp et al. 2003). In fact it is acknowledged that there is also dissent about the meaning of the term, 'quality of life', how to measure it, etc. Philosophers, sociologists, social anthropologists, psychologists, clinicians, health research scientists, economists, human ecologists, environmentalist and geographers, all have different perspectives, which, most often, reflect the preoccupations of their particular discipline.

In the literature we can find at least three different attempts, which have been made by philosophers, to define what quality of life is. One, *perfectionism*, focuses on the capacities that human beings possess: capacities for friendship, knowledge and creative activity, for instance. It says that the good life consists in the development and use of these capacities. Another account, the *preference theory*, urges that satisfying one's preferences, or desires, is what improves one's quality of life. And a third account, *hedonism*, sees life-quality as consisting in the enjoyment of pleasure and the avoidance of pain (Sandøe 1999).

Some concepts on QoL are strongly rooted in the thinking about health. A broad variety of concepts of QoL and their definitions were encountered in the literature. Some representative definitions document it.

Sociologist Szalai (1980) states that life quality refers to the degree of excellence or satisfactory character of life. A person's existential state, well-being, satisfaction with life is determined on the one hand by exogenous ('objective') facts and factors of his life and on the other hand by the endogenous ('subjective') perception and assessment he has of these facts and factors, of life and of himself.

WHO-QOL Group in 1993 (cited by van Kamp et al. 2003) defined QoL as an individual's perception of his/her position in life in the context of the culture and value systems in which he/she lives and in relation to his/her goals, expectations, standards and concerns.

Quality of life is the factual material and immaterial equipment of life and its perception characterised by health, living environment and legal and equity, work, family, etc. (RIVM 2000, cited by van Kamp et al. 2003).

Among definitions published in geographical literature we can quote R. J. Johnston (Johnston et al. (eds.) 1994: 493): 'The state of social well-being of an individual or group, either perceived or as identified by 'observable indicators'. Most studies of the quality of life concentrate on aspects of the human condition, either those revealed by observable indicators (in some cases, relative to defined norms) or those declared by individuals concern. Geographical studies of the concept have largely focused on the former, as revealed for the populations of defined areas'.

Veenhoeven (2000) suggests that one cannot meaningfully speak about 'quality of life' at large. It makes more sense to distinguish four qualities: 1) liveability of the environment, 2) life-ability of the person, 3) utility of life for the environment, and 4) appreciation of life by the person. In her view these qualities cannot be added, hence sum-scores make little sense.

The quality of life concept and concepts as for example sustainability, liveability, living quality, living environment, quality of place, residential-perception and -satisfaction, the evaluation of the residential and living environment do overlap, and are often used as synonyms—but every so often are contrasted. The different concepts find their origin in the various research fields and traditions e.g. health, safety, well-being, residential satisfaction and urban physical environment (van Kamp et al. 2003). The interrelations between the core concepts are placed in a framework along the dimensions of domain, geographical scale-level, indicator, time-frame and context (Pacione 2003).

Among some researcher there is an agreement that the meaningful definition of QoL must recognise that there are two linked dimensions to the concept. With respect to the first dimension several terms have been used, for example individual/personal QoL, subjective well-being, or life satisfaction. For the second dimension there are different levels and terms used, for example, urban QoL, community QoL, quality of place, environmental QoL. Since QoL is such a complex multifaceted concept, it is often argued that is important to combine two dimensions to provide a complete picture of QoL for a person or place (Massam 2002).

A number of studies use objective and subjective indicators for variety of spatial observation units such as basic census units, urban districts, cities and regions. Typically many of these studies use approaches based on economic, social, political and environmental indicators produce maps of well-being, livability, sustainability and QoL. The works on social indicators identifying areas of deprivation in cities are known as part of a welfare approach to human geography. There are also studies that attempt to use data on cities to produce a ranking of cities in terms of their success and/or QoL (Massam 2002). The importance of combining subjective and objective indicators in assessing the QoL has been increasingly stated as a research goal. A methodology for measuring QoL, which is an attempt to satisfy this objective, was discussed. It includes a perceptually derived set of weightings and objectively measured indicators (Rogerson et al. 1989).

In our understanding objective and subjective perspectives are paralleled as two separate dimensions of QoL, and treated as aspects of a dynamic process of everyday life. In this concept we examine a combination of measurable physical and social aspects of the urban environment and the perception of these. This perception is not only related to the objective characteristics of the urban environment but also personal and contextual

aspects. This view contends that quality is not only an attribute inherent in the urban environment but is a behaviour-related function of the interaction of urban environmental characteristics and person characteristics. We agree with Pacione (2003) that in order to obtain a proper understanding of urban QoL it is necessary to employ both objective and subjective evaluations. In other words, we must consider both 'the city on the ground' and 'the city in the mind'.

CASE STUDY 1: CITY ON THE GROUND—THE GEOGRAPHY OF QUALITY OF LIFE IN BRATISLAVA

The first case study of human geographical research in the field of quality of life studies is selected to illustrate the use of objective territorial indicators to examine differential quality of life in the city of Bratislava.

Bratislava, with a population of 0.43 million, is on the one hand one of the smallest capitals in Europe on the border with Hungary and Austria, on the other hand it is the Slovakia's largest city as well as its administrative, economic, financial and cultural centre. The rapid growth of the city since the 1950s, due to rural migration, has affected the quality of life in various sections of the city. While some of the 'modern districts (housing estates)' have become comparatively more attractive, the historic districts have lost population due to the deterioration of their neighbourhood and later due to the functional change. In addition, the construction of large housing estate Petržalka in the 1970s and construction of bridges over the Danube river have changed accessibility of various areas measurably, and have thus caused a transformation in the spatial pattern. After 1989 Bratislava has entered a new phase, a distinctive transitional phase with important implications for the trajectory of urban development. This new phase is characterised by special dynamics of renewed capitalism and in particular, the increasing internationalisation and globalisation of economy. This fundamental transition has been followed by other shifts in demographic behaviour, in social, cultural and political life, and in technology. Thus, Bratislava with its dynamic socio-demographic, economic, and environmental urban structures makes an interesting case study for geographical research on QoL.

In this research, as in previous studies (Ira 1998; 2003), particular attention was focused on conditions at both, the advantaged and the disadvantaged end of the quality and sustainability of the life spectrum. A combination of statistical and cartographic analysis was employed to identify differences in quality of life within the city.

Several sources were used to measure objective conditions associated with the places where inhabitants of Bratislava (and in the same time the respondents) lived. The creation of separate data files covering social, demographic, health, economic, environmental and infrastructure data (*Statistical office of the Slovak Republic—regional administration in Bratislava*, 2003) and census data (*Výsledky sčítania obyvateľov, domov a bytov 2001*, 2003) and their consolidation allowed the author to measure objective aspects of the life quality and explore numerous relationships.

Indicators are measured at the city district level to give a comprehensive picture about quality of life in Bratislava's neighbourhoods. They are grouped under 6 quality of life domains—environmental quality, dwelling equipment, ICT facilities, physical and social

health, social infrastructure and socio-demographic situation (see Table 1). The choice of quality of life indicators in Bratislava was based on the following criteria:

- be available for all 17 urban districts
- be easy to understand and help simplify complex information,
- have resonance and reflect quality of life concerns,
- have flexibility in a changing urban society,
- be able to allow comparability between city districts.

The objective of using the QoL Index is to show the position of individual urban districts within the city from the life quality point of view. It has a hierarchical structure consisting of six major problem areas and 35 indicators. The Index is calculated for 17 urban districts, expressed by a relative scale of 0–1, where a higher value means better QoL.

The aggregated QoL Index (likewise the Sustainable Development Index, see Mederly et al. 2002) is calculated as the arithmetical average of the sub indexes for the 35 variables explored. Additionally, sub indexes for the six major problem areas are calculated. Comparing them, it is possible to evaluate a QoL status in individual urban districts. The index should cover the significant aspects of QoL. Our index does not cover all aspects, only six important domains were selected:

- Dwelling equipment (share of persons living in permanently occupied dwellings equipped with: 1) refrigerator and freezer, 2) automatic washing machine, 3) colour TV, 4) refrigerator, 5) freezer, 6) car, 7) recreation cottage.
- Social and demographic situation (born in place of present permanent residence in %, index of femininity, average age in years, share of inhabitants (15+) with secondary education, share of inhabitants (+25) graduated from universities, vitality index, share of undenominational population)
- Physical and social health conditions (marriages per 1 000 inhabitants, divorces per 1 000 inhabitants, abortions per 1 000 inhabitants, deaths of neo-plasmas per 100 000 inhabitants, deaths of diseases of the circulatory system per 100 000 inhabitants).
- Information and communication technologies equipment (telephone lines per 1,000 inhabitants, public payphones per 1,000 inhabitants, share of persons living in permanently occupied dwellings equipped with telephone, computer, internet.
- Social infrastructure (shops-foodstuffs inc. supermarkets per 1000 inhabitants, shops-nonfoodstuffs per 1,000 inhabitants, centres of catering per 1000 inhabitants, libraries per 10,000 inhabitants, petrol stations per 10,000 inhabitants, department stores and shopping centres inc. hypermarkets per 10,000 inhabitants.
- Environmental quality, environmental problems (municipal waste energetically used in %, municipal waste in tons per capita, public greenery in ha per capita, parks in ha per capita).

For the computation, the variables were transformed into a consistent scale (0.1) according to the formula:

$I_{xi} = (X_i - X_{min}/X_{max} - X_{min})$ if the favourable value of the observed phenomena is decreasing with the increasing value of X_I

$I_{xi} = (X_{max} - X_i)/X_{max} - X_{min})$ if the favourable value of the phenomena is increasing with increasing value of X_i,

0 = the most unfavourable value of I_{xi}; 1 = the most favourable value of I_{xi}

Using this process, the data necessary for the calculation of the aggregated QOL Index and the sub indexes for the seven problem areas were obtained.

As Table 1 indicates, in this study calculation of scores for 6 domains provided a measure of quality for each of the 17 urban districts in the city.

Old Town and Karlova Ves (urban districts mostly created by housing estates build in late 1960s and late 1980s) had the highest ICT facilities index values. The worst situation was shown for the peripheral districts, Podunajske Biskupice, Rusovce and Vajnory. The index of ICT facilities has shown the most significant territorial disparities.

The highest score of dwelling equipment index is in the peripheral districts Čunovo and Jarovce in the south and in Záhorská Bystrica in the western sector of the city. As far as environmental situation conserned, the most favourable score characterises two southern districts on the Danube right river bank.

Index of physical and social health shows least significant spatial disparities. The urban districts of the highest score within city studied were found in the cluster of western spatial units Devínska Nová Ves, Dúbravka, Karlova Ves, Lamač, in the units of southern city sector—Čunovo and Petržalka, in Podunajské Biskupice, and Vajnory. Regional differences of social infrastructure index are not very significant. The highest score reflects the favourable situation in the districts Devín, Ružinov, and in the very centre—Staré Mesto. Analysis of socio-demographic situation (measured by seven indicators) indicates the best position of peripheral urban districts Vajnory, Čunovo and Devínska Nová Ves.

Table 1. Indexes of six analysed quality of life domains

Urban district	Index of ICT facilities	Index of dwelling equipment	Index of environmental quality	Index of physical and social health	Index of social infrastructure	Index of socio-demographic situation
Stare Mesto	0.64	0.31	0.40	0.47	0.42	0.34
Podunajske Biskupice	0.10	0.31	0.46	0.61	0.30	0.40
Ružinov	0.26	0.31	0.43	0.50	0.48	0.25
Vrakuňa	0.36	0.32	0.43	0.57	0.10	0.48
Nové Město	0.36	0.27	0.30	0.52	0.30	0.25
Rača	0.22	0.34	0.43	0.57	0.21	0.37
Vajnory	0.15	0.41	0.38	0.64	0.34	0.52
Devin	0.49	0.17	0.38	0.43	0.53	0.37
Devínska Nova Ves	0.43	0.39	0.48	0.60	0.19	0.60
Dúbravka	0.31	0.40	0.51	0.61	0.13	0.37
Karlova Ves	0.69	0.57	0.40	0.61	0.09	0.47
Lamac	0.52	0.55	0.49	0.59	0.24	0.30
Záhorská Bystrica	0.51	0.65	0.07	0.40	0.14	0.43
Cunovo	0.26	0.73	0.55	0.59	0.33	0.60
Jarovce	0.23	0.66	0.25	0.56	0.23	0.48
Petržalka	0.46	0.43	0.48	0.62	0.20	0.48
Rusovce	0.12	0.37	0.60	0.43	0.32	0.45

Mapping the overall QoL index scores revealed the spatial expression of the objective evaluation of quality of life in Bratislava (Map 1). The highest OoL Index values had urban district Cunovo, in the past independent village and now the remotest part of Bratislava on the right bank of the Danube. Attraction of the environs of Čunovo is the Gabcíkovo dam, a modern water sport area and the recently founded gallery Mini-Slovakia (miniature copies of the most important cultural and historical monuments existing in Slovakia). The worst situation was shown for the zone of four districts in the eastern part of the city—Raca, Nové Mesto, Ruzinov and Podunajske Biskupice. The map of objective evaluation shows significant differences between the western and eastern part of the capital.

This research identified the nature, intensity and incidence of several QoL factors within the city. In addition identification of the major areas characterised by the low score of QoL Index provides a basis for subsequent detailed analyses of particular problems and problem areas. The analytical results also provide a base for the critical assessment of policies aimed at alleviating conditions of disadvantage, as well as a framework for future developmental policy formulation.

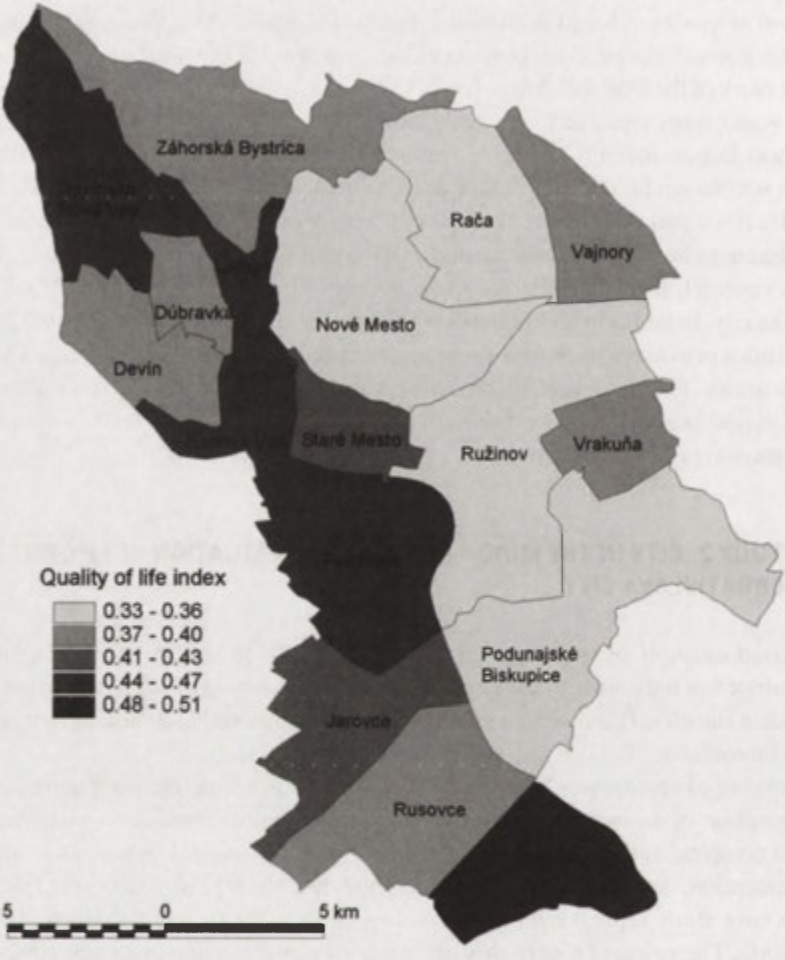
CASE STUDY 2: CITY IN THE MIND—SUBJECTIVE EVALUATION OF LIFE QUALITY WITHIN BRATISLAVA CITY

The second example of the urban geography approach to quality of life illustrates the use of subjective indicators to gauge the differentiated quality of life at the urban district level within the city. The research employed a questionnaire procedure to determine the relative importance of crime as a social problem on the estate.

A number of researchers have argued that QoL depends on the unique interpretation and perception of an individual and that the questionnaires represent a simplification of what is a complex, multidimensional, subjective phenomenon. QoL is seen as uniquely personal perception, denoting the way that individuals feel about various aspects of their lives.

This case study reports data from a survey in Bratislava on QoL, which was carried out in 2003. The primary aim of this study was to explore, using open and closed survey questions, people's perceptions of the important domains of quality of life (the meaning of the phrase quality of life), and their assessments of their overall quality of life in the urban districts. The aim of the analyses presented here was to explore subjective components and ratings of overall quality of life. Data from a survey carried out in 2003 formed the vehicle for the analyses reported here. This was an interview survey based on a random sample of people aged 15 and over in Bratislava. Respondents were interviewed in person (mostly in their own homes). The total number of adults interviewed was 717, resulting in 520 usable questionnaires, and representing a response rate of 73%. The socio-demographic characteristics of the responders were compared favourably with census data. The theoretically relevant, socio-demographic and geographic variables analysed were respondent's age, sex, education and urban district of residence.

The meaning of the phrase quality of life differs a good deal as it is variously used. In general, it is intended to refer to either the conditions of the environment in which people live, or to some attribute of people themselves. (Pacione 1982, 1986).



Map 1. Quality of life in Bratislava by urban districts

Table 2 shows the ten most commonly mentioned important areas of life quality listed by respondents, i.e. the areas prioritised as most important in responses to the question: What do you mean by the phrase quality of life? Almost a quarter of all respondents mentioned finances/sufficiency, and just over a fifth mentioned health as the important meaning of the phrase quality of life. Housing was mentioned by 15.4%, followed by life satisfaction by just over 12%, family over 11%, attractive environment under 11%, interpersonal relations under 11%, and commercial services, clean environment, sport and leisure—each by just a tenth.

As far as estimation of the quality of life by urban districts is concerned (Table 3) the best situation is in case of Stare Mesto (Old Town). Almost three thirds of respondents

(74.0 %) estimated quality of life as good and very good. The Old Town in its historical eastern part has a character of urban preservation district with many cultural monuments and well developed services. Western part with villa neighbourhood in the greenery belongs to the most attractive residential areas within the city. Relatively positive estimations were recorded for western urban district Devín in the picturesque Carpathian landscape with the Devín castle at the confluence of the Danube and Morava rivers (59.2%), and district Karlova Ves with new housing estates, area of University campus, the botanical garden and the ZOO located closer to centre (57.5%). The same estimation of the QoL characterises the second largest urban districts Ružinov on a flat landscape where mosaics of large housing estates, former villages, industrial zones and gardens alternate (53.5%) and urban district Rača on the foothill of the forested massive of the Little Carpathians (52.7%).

Table 2. The meaning of the phrase quality of life

Areas	% of respondents
Finances/ sufficiency / standard of living	22.7
Health	20.2
Housing	15.4
Life satisfaction	12.1
Family	11.4
Attractive environment	11.0
Interpersonal relations	10.8
Commercial services	10.0
Clean environment	10.0
Sport and leisure	10.0

No. of respondents from Bratislava 520

Note: Responses do not equal 100% as some respondents listed more than one area of life

On the contrary, the quality of life in Petržalka is estimated by 49.0 % of respondents as bad and very bad (Table 3). In 1970s the largest housing estate in Slovakia was built there (116,209 inhabitants in 2003). Because of the problems, which have emerged, it has become a symbol for the inadequacies of the housing and urban planning policies of the communist regime (Strhan and Daniel, 1994). More than a quarter of respondents negatively estimated quality of life in urban districts on eastern edge of Bratislava—Vrakuňa (27.7%) and Podunajské Biskupice (27.5%), both on a flat landscape with mosaic of former villages, gardens and housing estates from the 1970s.

The map of values of differences between the positive and negative QoL perceptions (Map 2) shows that the most significant differences are in the urban western districts along the Danube river—Staré Mesto, Karlova Ves and Devín. Urban districts Podunajské Biskupice, Vrakuňa and Petržalka, dominated by housing estates built in the 1970s showed differences in favour of negative QoL perception.

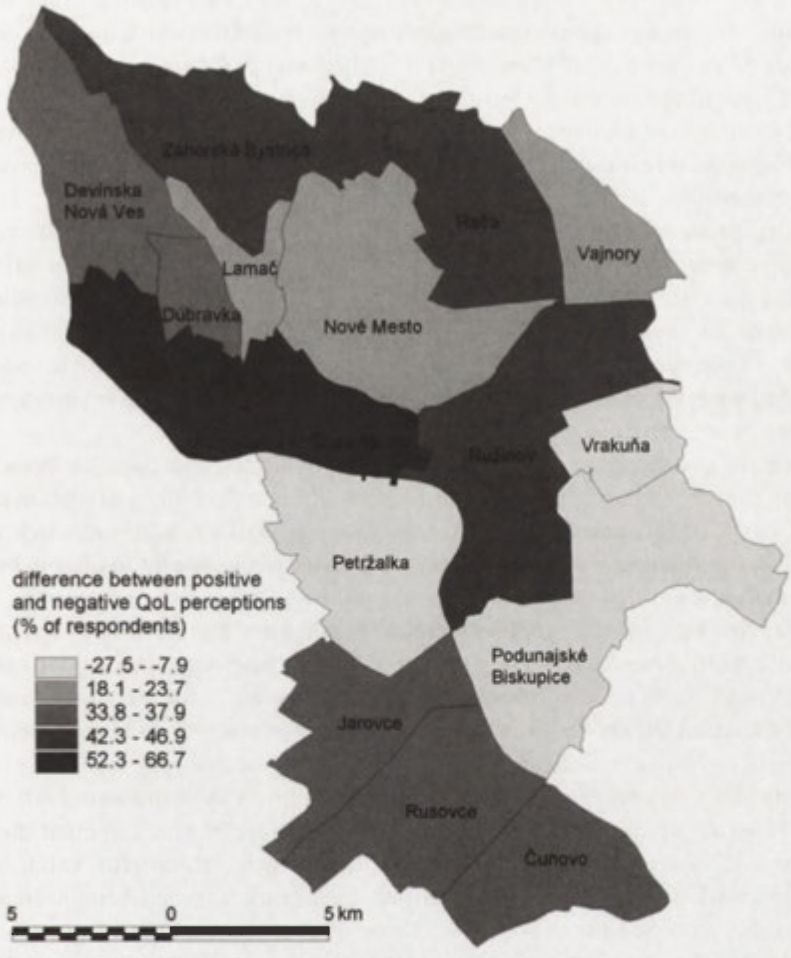
Our two case studies demonstrate that what a respondent perceives as good or bad quality of life does not necessarily correspond to what is included in an objective assessment. The results of comparative analysis of both 'the city on the ground' and 'the city in the mind', i.e. objective and subjective evaluations are contained in Table 3. In 13 of 17 urban districts studied, the subjective assessment was higher than the objective one (especially in case of urban districts Staré Mesto, Ruzinov, Nové Mesto, Raca, Devín, Dúbravka, Záhorská Bystrica and Rusovce). On the contrary objective assessment of urban districts Petržalka, Lamač and Čunovo was more favourable than the subjective through the perception of Bratislava's inhabitants.

Table 3. Quality of life perceptions and differences between the subjective and objective assessment

Urban district	Positive perception (% of respondents)	Negative perception (% of respondents)	Differences between subjective and objective assessment
Staré Mesto	74.0	7.3	++
Podunajské Biskupice	19.6	27.5	+
Ruzinov	53.5	11.2	++
Vrakuňa	17.3	27.7	+
Nové Mesto	37.7	14.0	++
Raca	52.7	7.5	++
Vajnory	31.0	12.9	+
Devín	59.2	6.0	++
Devínska Nova Ves	46.2	8.3	+
Dúbravka	46.7	9.0	++
Karlova Ves	57.5	5.2	+
Lamač	35.2	12.9	–
Záhorská Bystrica	53.1	6.2	++
Čuňovo	41.9	7.3	–
Jarovce	41.2	7.3	O
Petržalka	21.5	49.0	––
Rusovce	43.1	6.9	++

CONCLUSION

Bratislava is on the one hand a historical Central European city and on the other hand the new capital (since 1993) and a dynamic urban system with over 430,000 inhabitants. The city is diverse from both, natural and socio-cultural point of view, and can generate various conditions for living. In recent years political, social and economic changes accelerated diversification of the city. The gap between those at the top and those at the bottom of the living conditions scale has actually widened and the improvement quality of life and regenerating these poorer areas is a priority.



Map 2. Differences between the positive and negative quality of life perceptions by urban districts

We can agree with McMahon (2002) that the development of quality of life or sustainability indicators should represent all sectors of society and can give us essential knowledge about needy areas that is required before, during and after regeneration and improvement. Knowledge of spatial patterns can raise awareness about quality of life in neighbourhoods, and allow comparability of wards (urban districts) within city. Mapping of indicators generates a vast amount of information about neighbourhoods. This can support interest for national and the EU funds for regeneration. At an individual level this can influence and motivate sustainable choices and action for change.

These two case studies demonstrate that what a respondent means by quality of life does not necessarily correspond to what is included in an objective assessment. From the

human geographical point of view it seems that a better understanding of the meaning of life quality requires the systematic study of the interrelationships between objective measures of 'environmental' phenomena (i.e. phenomena of political, economic, social, cultural and natural environment), and people's responses to them.

The usefulness of measuring quality of life is of central importance in the current applied geographical research. Geographers engaged in quality of life research have identified several outputs of value to social scientists and policy makers (Pacione 2003). These include e.g. production of some baseline measures of QoL against which we can compare subsequent measures and identify trends over time, knowledge of how satisfactions and dissatisfactions are distributed through society and across space, understanding how people combine their feelings about individual life concerns into an overall evaluation of quality of life, identifying problems meriting special attention and possible societal action, monitoring the effects of policies on the ground, promoting public participation in the policy making process, and others

In spite of interdisciplinary efforts in the quality of life research there has been insufficient results of collaboration between people from different disciplines. Studies in philosophy, sociology, social anthropology, psychology, human ecology, health research science, economics, environmental research science, and geography have a lot to offer in illumination of the impact of natural, man-made and psycho-social environment on the lives of inhabitants in cities, how they cope with problems, adapt and learn to live. By scientific criteria quality of life research is at a stage where not all outcomes should be applied in settings where decisions about peoples/inhabitants' lives and their environment may be made.

Consideration should be given to different types of research in QoL. One of them would be basic research, which attempted to define, refine and understand the concept of 'quality of life', in order to ascertain if it could meaningfully be measured. The second type of research would focus on the best possible manner in which to elicit the views, concerns and values of inhabitants with respect to their meaningful, valid, healthy, and balanced living (personal, societal and environmental well-being). In context to this, theory development should be encouraged at the expense of questionnaires development. The geographer's experience of both types of research ensure that the human geography can also contribute to the future sustainability and better quality of life in the cities.

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QUALITY AND SUSTAINABILITY OF LIFE WITH A SPECIAL EMPHASIS ON REGIONAL ENVIRONMENTAL ASPECTS

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During last decades, two concepts have been discussed with increased frequency: Quality of life concept and sustainability/or sustainable development concept. Sometimes they are discussed separately, sometimes and more and more frequently, in a common context.

QUALITY OF LIFE (QOL): SELECTED DEFINITIONS

Let us introduce several definitions in the chronological order:

1. Excellent, eventually satisfactory way of living, state of the individual/personal stay of the existence, health, well-being, satisfaction with the manner of life/living, etc. which is determined on the one hand by exogenous/objective conditions and factors, and on the other hand by endogenous/subjective perception and evaluation of these conditions, as well as of persons themselves (Szalai 1980).

2. An individual perception of his/her position in life in the context of the culture and value systems in which he/she lives in relation to his/her goals, expectations, standards and concerns (WHO-QOL Group 1993).

3. QoL indicates qualitative parameters of the human life, way of living, living style, and as well as living conditions of the society. It is a contradiction between the simply qualitative, macro-aggregated economy and profit-related criteria of efficiency, competitiveness and success of the social system. Idea of QoL use to be usually understood as a contradiction to the consumer way of living/living style with its preference to the ownership of consumer goods, which themselves could not to satisfy a human being. The QoL means that a new image of the world and human being is under construction, where a solution to the contemporary unsatisfactory state is looked for through different interpretations of the existence (Hanusin et al. 2000).

In principle, there are three understandable and reasonable 'pure' approaches to the relationship between the SD and QoL concepts:

1. Both concepts have more or less the same meaning, it means, they are understandable as a synonyms. Especially, if we prefer the 'social sustainability' approach to other ones.
2. SD is a wider concept, which includes QoL aspects as a dimension and/or an attribute.
3. QoL is a wider concept, which includes SD as a precondition.

However, in reality, there exist several combinations of the above-mentioned concepts, which often overlap.

The reason of SD is the improvement of the quality of human life while living within the carrying capacity of supporting ecosystems (IUCN et al. 1991).

Caring for the Earth—A Strategy for Sustainable Living (IUCN et al. 1991) recognised the quality of life improvement as one of 9 identified principles for sustainable living. It argues, that the aim of development is to improve the quality of human life. It should enable people to realize their potential and to lead lives of dignity and fulfilment. Economic growth is part of development, but it cannot be a goal in itself—it cannot go on indefinitely. People distinguish the goals they should reach for the sake of development. These include a long and healthy life, education, access to the resources for a decent standard of living, political freedom, guaranteed human rights and elimination of violence. Development is real only if it makes better all these aspects of our live.

SUSTAINABLE DEVELOPMENT AS A TOOL FOR THE QUALITY OF LIFE IMPROVEMENT

Sustainable development is such a kind of development that improves the quality of human life while living within the carrying capacity of supporting ecosystems (IUCN et al. 1980) or (WCED 1987): SD is a global process of development that minimises environmental resources losses and reduces the impact on environment sinks using processes that simultaneously improve economy and the quality of life.

Sutton (2000) distinguishes two relevant levels of sustainability: One is the maintenance of basic sustainability and this is usefully interpreted as 'survival sustainability'. This involves the maintenance of ecological life-support systems, the social capacity to solve major problems and the economic capacity to meet subsistence needs of the population. At this basic level of sustainability all three requirements must be met simultaneously.

The other level relates to the maintenance or restoration of the normally expected quality of life. In some regions this quality of life is far beyond the level required for basic survival.

The pursuit of sustainability, by definition, does not imply efforts to create for **the first time** a higher level for our quality of life. Such an activity or aspiration goes beyond the concept of maintenance and so goes beyond sustainability. This is not to say, that people should not aspire to improve their quality of life beyond their normally expected level, it is just that it undermines the meaning and 'power' of the concept of sustainability to try to treat the concept beyond its core meaning.

For example, the pursuit of survival sustainability and improved quality of life may sometimes conflict. It is possible for communities to put such large amounts of effort into

improving several 'popular' aspects of their quality of life (aesthetics, time saving, etc.) that they fail to put enough effort into ensuring survival sustainability. This is what most affluent societies are doing.

What is the lowest common denominator joining sustainability and quality of life concepts?

- It is the optimal functioning of living systems, first of all of human beings.
- Improvement of the complex of living conditions for contemporary, as well as future generations.
- Combination of objective and subjective aspects.

Quality of life concept, unlike the sustainability concept, does not automatically imply the long-term perspective.

Sustainability is based on several principles and criteria, using indicators, which are better measurable; QoL is more based on subjective aspects.

On the other hand, SD concept seems to be much more complicated by its principle, trying to synthesise different, even sometimes, contradictory dimensions, like the growth of economy and the environmental protection. QoL is, first of all, the social category and other categories/dimensions of development are of the 'reference' character to.

QoL concept represents the quality of **human** life. It means, it is evidently anthropocentrically oriented, primarily oriented to the individual.

SD concept has different interpretations concerning its alternative inclinations towards anthropocentrism or ecocentrism, but in general, it is not automatically related only to human beings/society or even to the individual, only.

In praxis, one of the common features of both concepts is using indicators for measuring progress or regress towards the higher QoL, or towards the higher level of sustainability.

INDICATORS APPROACHES

1. ENVIRONMENTAL INDICATORS FOR SUSTAINABLE CITIES (Huba et al. 1998, 2000)

The approach is based on the selection of a relevant set of environmental sustainability indicators for Slovak towns and cities in general, as well as its modification for each of selected individual cities. The set of 154 proposed indicators was subdivided by the OECD methodology into 3 main categories:

- Driving force
- State
- Response

An example: Groups of the state indicators [they are sub-divided into more than50 individual indicators]:

1. Air pollution/emissions.
2. Qualitative and quantitative characteristics of water management.
3. Quality of top soil horizon, erosion and character of land use.
4. Waste management.
5. Biodiversity protection.
6. Greenery for recreation.

7. Human health in relationship to the environment.
8. Efficiency/effectiveness and/or sustainability of natural resource management [including transport].
9. Quality of environmental management in the city.
10. The extent and quality of the environmental upbringing and education.
11. The extent and effectiveness of public participation in the field of the environmental improvement.

2. SUSTAINABLE DEVELOPMENT STRATEGY FOR MODEL TERRITORIES (Huba and Ira 2000)

Formulation of SD strategies has been based, inter alia, on a set of indicated pro-sustainable activities, provided by individual municipalities. Assessment of local mayors responses concerning the realisation of individual activities served as an indicator of acceptability of the SD strategy implementation in particular town/village/region.

3. REGIONAL ASPECTS OF DEVELOPMENT TOWARDS SUSTAINABLE SLOVAKIA (HUBA ET AL. 2003)

Results of landscape ecological as well as human ecological research conducted during recent period in Slovakia are included in the above quoted article. A special interest is given to the regional/sub-national dimension. The set of 41 indicators, aggregated to 6 groups, addressing six SD dimensions has been used with the aim to characterise the state and development of Slovak administrative regions [ecological, environmental, economic, demographic and social dimension plus dimension of modernisation and informatisation].

Great differences are evident in Slovakia concerning regional disparities among individual administrative regions using the about mentioned indicators. The findings of the analyses show a considerable imbalance of the state of regional development. The greatest difference has been recognised in the rate of modernisation and informatisation of the society between Bratislava region and other administrative regions in Slovakia. On the other hand, some extremes eventually compensate each other. E.g. regions with the highest value of traditional indicators of economic prosperity tend to extensive consumption and consequently higher production of communal wastes and other substances, which burden and pollute the environment. The regions, however, can partially eliminate their effect by a higher level of environmental infrastructure. Likewise, administrative regions with more favourable values of several indicators of social and health-care character often display negative demographic or even socio-pathological characteristics. A highly productive landscape with high portion of arable land or highly urbanised landscape has, as a rule, lower index of ecological stability.

The next step was the introduction of the Integrated Sustainable Development

Index—ISDI in order to express the global situation of Slovak regions from the SD perspective. The course of the main line dividing the regions with higher and lower ISDI runs in the west-east direction instead of expected north-south direction. It separates three administrative regions of the southern and south-eastern Slovakia from other part of the country.

4. DEVELOPMENT OF SLOVAKIA IN THE LAST DECADE OF 20th CENTURY IN THE LIGHT OF SELECTED INDICATORS (HUBA 2003)

A set of 105 relevant indicators was used to characterise the development of Slovakia towards a more sustainable future in the recent period. The global relation between positive and negative features of the development of Slovakia was 58 : 47, what can be expressed by the coefficient 1.25.

The best situation has been recognised in the field of the environment, where the relation was 22:7 [coefficient 3.14], and the worst in the field of economy, with the relation 17:21 [coefficient 0.81], while the situation in social sphere expressed the stable development with the relation 19:19 [coefficient 1.00].

5. ENVIRONMENTAL INDICATORS FOR MEASURING INTER-REGIONAL DISPARITIES (HUBA 2004)

Analysis of territorial (regional) disparities and their development in the later half of the 1990s showed that the selected SD indicators grew in ten, stagnated in one, and declined only in five cases of total 16. In other words, the hypothesis that the territorial [regional] disparities in Slovakia tend to increase was confirmed. On the other hand, in the field of the environment the growth of disparities is much less evident than in the field of social issues and/or economy.

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THE STUDY OF CHANGING SPATIAL PATTERNS USING FUZZY METHODS

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INTRODUCTION

The aim of this paper is to present usefulness of Fuzzy C-Means Clustering and Fuzzy Kohonen Networks methods for the study of changing spatial patterns. Both methods are well described in the literature (Nelles 2001; Alam et al. 2000; Zimmermann 1999), but are not used for the study of changing spatial patterns although they seem especially appropriate for that aim. The study of changing spatial patterns of voivodships, i.e. analysing and comparing them is needed for many reasons, e.g. such a study is carried out in order to distinguish different levels of development in Poland. Forecasting the future socio-economic level of the development of the voivodships is an attempt to delimit the economic regions.

Until 1989 the sectorial preferences carried out within the centrally planned and administered economy constituted the main feature of regional differences in Poland. The funds supporting regional development passed to the privileged economic sectors. After Poland's accession to the European Union, the identification of a different level of regional development is one of the main problems of the member states in the aspect of regional policy. This study, carried out by means of the mentioned above methods, is of a multi-criteria classification nature. Both presented methods are recommended for investigating the poorly investigated structures of similarity. The results of these analyses are crucial for economic practice, e.g. for formulating the strategy of the development of voivodships and managing their development (Nowak 2004).

The study of changing spatial patterns of voivodships requires a multi-attribute approach since multiple different attributes have to be taken into account. These include:

population density, urbanization level, regional development level, employment rate, entrepreneurship, level of investments, procurement of agricultural products, road infrastructure density.

The study of changing conditions of the regions is the problem requiring comparison with the condition of other voivodships. Social and economic differences of the voivodships are expressed by the following features: the level of regional development defined by GDP per capita, employment rate (the number of the employed per 1,000 inhabitants), entrepreneurship (the number of entities of the national economy recorded in the REGON is measured), innovatory (gross domestic expenditure on the research and development activity per capita), the industrial character of the region (sold production of industry in PLN per capita), in the economy of the region, procurement of agricultural products (the value of the purchase of the agricultural products per 1 hectare of arable lands), the road infrastructure density.

Formulation of useful operative algorithms for comparisons of changing spatial patterns (situation of regions) is a difficult problem. Such analyses are burdened with uncertainty and inaccuracy resulting from: (1) the conflicting nature of the evaluation criteria (e.g. a voivodship with a high quality of life measured with GDP per capita does not have a high quality of the feature of the number of the employed per 1,000 inhabitants), (2) the occurrence of various differences of values between the evaluations, and (3) from the problem how large differences of values are significant and which are too small to be serious differences, (4) the appearance of incomparable regions, which may result, for instance, from a different character of the natural environment, which determines the development, e.g. there are regions with the high procurement of agricultural products that results from the quality of the agricultural productive space and agricultural cultivation. There are regions with a developed tourist function and the low procurement of agricultural products resulting from the types of the surface relief and the soil.

Taking the above into consideration we propose to apply an approach based on fuzzy methods (Zimmermann 1999) to cope with the problem. Fuzzy Clustering and Fuzzy Kohonen Networks allow to take into account the uncertainty and inaccuracy of the comparison and study of the region's changing situation, due to conceptual and mathematical approach of fuzzy set theory.

In calculation and analysis we have applied DataEngine software from the German company MIT-Management Intelligenter Technologien GmbH of Aachen (DataEngine 2002), because it contains both algorithms necessary to use both methods offered by us: Fuzzy C-Means Clustering and Fuzzy Kohonen Networks.

DIAGNOSTIC FEATURES USED TO STUDY CHANGING SPATIAL PATTERNS (REGIONS)

When carrying out the analysis we have to choose diagnostic features in advance to show social and economic differences of investigated voivodships.

Poland's differentiation within the voivodships is defined by the features describing: economic potential (GDP per capita), the employment rate (the number of the employed per 1,000 inhabitants), entrepreneurship (the number of entities recorded in the REGON per 1,000 inhabitants), innovatory of the regions' economies (gross domestic expenditure

on the research and development activity per capita), sold production of industry per capita, procurement of agricultural products as the value of the purchase of the agricultural products per 1 hectare of arable lands), and transport accessibility (the road infrastructure density, i.e. hard surface public roads per 100 square km).

The economic potential of a voivodship expressed by GDP per capita differs significantly in the regions. With the average GDP of PLN 17,905 in 2003, the highest value of this prosperity and the quality of life measure in Mazowieckie voivodship was PLN 30,283, i.e. 70% above the average value for Poland. The second on the list Silesian voivodship has 18% above the average. The difference between the highest and the lowest income is PLN 16,669—the lowest income per capita was in Lubelskie voivodship.

The population activity is expressed with the number of the employed per 1,000 inhabitants. It is the highest in Lubelskie voivodship, and the lowest in Warmińsko-mazurskie voivodship. This feature has high values in the eastern voivodships. The high value of this feature suggests inappropriate use of the people's potential and high unemployment in the regions. It is weakly but negatively correlated with GDP per capita ($r = -0.075$).

The most entities of the national economy are in Zachodniopomorskie voivodship—over 1.8 times more than in Podkarpackie voivodship, which has the lowest value of this feature. This feature is highly correlated with GDP per capita ($r = 0.758$) and the sold production of industry per capita ($r = 0.563$).

The amount of gross domestic expenditure on the research & development activity differs with regard to the regions. In respect of this feature Mazowieckie voivodship heads the list with the gross domestic expenditure of PLN 389 per capita. It is much lower in Małopolskie voivodship—only PLN 153 per capita—which is in the second place of the list of voivodships as regards this feature. The last but one is Lubuskie voivodship with PLN 25 per capita and the last is Świętokrzyskie voivodship—PLN 11 per capita.

The potential and the industry up-to-dateness has a particular significance for the recognition of the regional structures. One of the factors of the evaluation of the industrial effectiveness is the value of the sold production of industry per capita. This factor ranges from PLN 20,500 per capita in Mazowieckie voivodship to only PLN 6,200 per capita in Podlaskie voivodship.

The value of the purchase of the agricultural products in PLN per 1 ha is the highest in Wielkopolskie voivodship—PLN 2,298 per hectare. The lowest value (four times lower) is in Podkarpackie voivodship. This feature has low values of a correlation factor in comparison with all the analysed features.

As far as the road network density is concerned, Silesian voivodship is distinctive—with the road network density of 163 km per 100 square km. Podlaskie voivodship is the poorest in this respect with only 53 km per 100 square km. This feature is weakly correlated with the remaining features under investigation. It shows the highest correlation with the sold production of industry per capita ($r = 0.415$).

The general descriptive statistics of the mentioned above quantities and ratios have been calculated.

For all attributes the correlation analysis was made. Some of the ratios were strongly correlated, e.g. the highest rate of correlation occurs between the following features: GDP per capita and sold production of industry $r = 0.889$ and gross domestic expenditures on

Table 1. Geographical matrix of diagnostic features for the evaluation of the level of the voivodships development (2003)

Voivodships	Gross domestic product per capita	Employed persons per 1000 population	Entities of the national economy recorded in the REGON per 1000 population	Gross domestic expenditures on research and development activity per capita	Sold production of industry in mln zl per capita	Procurement of major agricultural products per 1ha of agricultural land	Hard surface public roads in km per 100 km²
	GDP	EMPL	ENTREG	RESDEV	PRODIND	AGRP	ROADS
dolnośląskie	19 758	316	102	95	12 906	1 378	92
kujawsko-pomorskie	17 563	383	89	53	11 981	1 991	78
lubelskie	13 614	422	68	63	6 268	1 212	71
lubuskie	17 254	352	95	25	10 828	1 175	56
łódzkie	17 535	415	89	115	12 204	1 582	88
małopolskie	16 788	381	86	153	11 198	799	144
mazowieckie	30 283	377	108	389	20 576	1 299	80
opolskie	15 780	323	80	28	11 696	1 570	88
podkarpackie	13 870	359	66	57	9 134	656	79
podlaskie	14 727	372	78	31	7 622	1 540	53
pomorskie	19 301	326	99	150	14 202	926	62
śląskie	21 206	325	88	72	18 228	939	163
świętokrzyskie	14 843	378	77	11	8 700	773	96
warmińsko-mazurskie	14 065	309	76	39	9 273	1 579	54
wielkopolskie	20 634	376	97	97	15 727	2 298	81
zachodniopomorskie	19 269	328	115	53	9 064	1 136	57

Source: *The statistic annual set of the voivodships, 2003*, GUS, Warsaw.

Table 2. The descriptive statistics of the social and economic features of the voivodships

Feature	Symbol of feature	Minimum	Maximum	Average	Standard deviation	Standard deviation/ average	Skewness	Kurtosis
Gross domestic product per capita in 2002	GPD	13614	30283	17905.63	4116.29	0.22	1.84	4.86
Employed persons per 1000 population in 2002	EMPL	309	422	358.88	34.84	0.09	0.21	-0.91
Entities of the national economy recorded in the Regon per 1000 population	ENTREG	66	115	88.31	13.88	0.15	0.196	-0.53
Gross domestic expenditures on research and development activity per capita	RESDEV	11	3389	89.44	90.53	1.02	2.66	8.41
Sold production of industry in mln zl per capita	PRODIND	6268	20576	11850.44	3837.29	0.32	0.88	0.54
Procurement of major agricultural products per 1ha of agricultural land in 2002	AGRP	656	2298	1303.31	449.53	0.19	0.60	0.149
Hard surface public roads in km per 100 km^2	ROADS	53	163	83.87	30.76	0.36	1.58	2.45

Source: Authors' calculations based on the DataEngine.

the research and development activity r = 0.838 and the number of the entities of the national economy per 100 inhabitants r = 0.758.

Because the features are expressed in different units of measure, e.g. GDP in PLN per capita. the value of the purchase of agricultural products in PLN per 1 hectare of arable lands, hard surface public roads in km per 100 square km, as well as the ranges of analysed features PLN 30,283 of GDP per capita up to PLN 11 (gross domestic expenditures on the research and development activity per capita), we normalized them in order to prevent accidental weighting of variables which could result from the differences in the measurement scale. The data were normalized within the scale between 0 and 1.

Table 3. The correlation matrix of the social and economic features

	GPD	EMPL	ENTREG	RESDEV	PRODIND	AGRP	ROADS
GPD	1	-0.075	0.758	0.838	0.889	0.123	0.182
EMPL	-0.075	1	-0.277	0.174	-0.173	0.125	0.023
ENTREG	0.758	-0.277	1	0.478	0.563	0.175	-0.064
RESDEV	0.838	0.174	0.478	1	0.706	-0.040	0.132
PRODIND	0.889	-0.173	0.563	0.706	1	0.154	0.415
AGRP	0.123	0.125	0.175	-0.040	0.154	1	-0.311
ROADS	0.182	0.023	-0.064	0.136	0.415	-0.311	1

Source: authors' calculations based on the DataEngine.

FUZZY CLUSTERING FOR THE STUDY OF CHANGING SPATIAL PATTERNS

A comparative study of voivodships (regions) was carried out using Fuzzy C-Means method (FCM), an iterative method of clustering (Flores-Sintas et al. 1999; Everitt et al. 2001; Windham 1981). In this method cluster centers are determined using an iteration algorithm and each cluster center represents the whole cluster. The number of clusters has to be equal to 2 or higher, and has to be known before a procedure of iterative clustering begins. We should also assume the so-called m exponent; $m > 1.0$ which shows the extent of fuzziness of the results of clustering. In the case of $m \rightarrow 1$, the results become closer to the results obtained with the aid of a 'non-fuzzy' method. In case of $m \rightarrow \infty$, the values of membership of objects to clusters tend to become increasingly closer to the inverse of a number of c classes, i.e. $\frac{1}{c}$

In Fuzzy C-Means algorithm degrees of membership for each object (voivodships) to each cluster are initialised randomly, cluster centers with the help of degrees of membership (defined at the previous step) are calculated, new membership degrees with the help of cluster centers from the previous step are determined (in that step Euclidean distance is used), and new membership degrees are iteratively used to calculate new cluster centers. The procedure is completed when the Euclidean distance between the two successive calculated membership degrees is smaller than the made as an assumption convergence threshold ε.

The algorithm determines the cluster centers (conglomerations) and the degrees of membership for objects to clusters. The 'stretching' clusters are not identified by the algorithm. Since Euclidean distance was assumed as a measure of distance, clusters with a spherical structure are being detected. The 'stretching' clusters are not identified by the algorithm. As it was already mentioned above, prior to starting of grouping companies, the number of clusters into which we want to subdivide them should be indicated. In order to decide about the number of clusters, coefficients: *pc* (*partition coefficient*) and

pe (*partition entropy*) were applied (Windham 1981). The higher is *pc* and the lower is *pe*, the result of clustering is 'less fuzzy'. When $pc = 1$ and $pe = 0$, we are dealing with 'non-fuzzy' clusters. The values of such coefficients for different number of clusters—from 2 to 10—were examined. The stronger the concentration of objects around the cluster centers, the better is the structure of clusters, and thus the quality of results of the clustering procedure. The 'best' number of clusters is the number where the value of the *pe* entropy indicator is below a growing trend (together with the number of clusters), and of the *pc* indicator is above a falling trend (together with the number of clusters). In our case, as shown in Figure 1 a possible solution is 5 clusters.

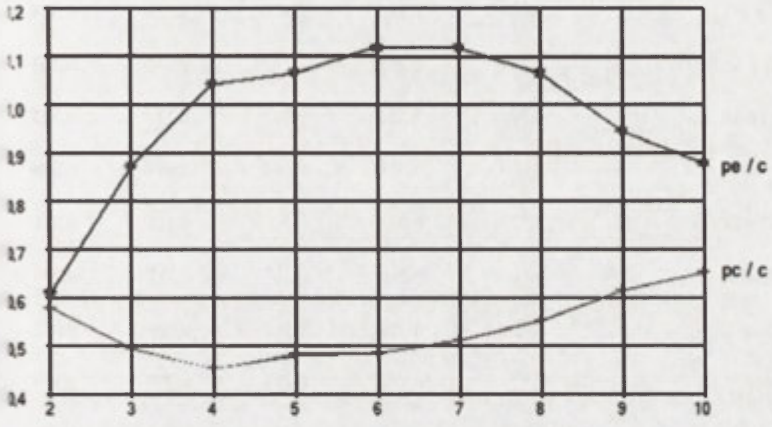

Figure 1. Diagram of *pc* (*partition coefficient*) and *pe* (*partition entropy*) for cluster analysis of voivodships
Source: The DataEngine software estimations.

Conglomeration A includes voivodships with a relatively high GDP per capita, a low rate of employment per 1,000 inhabitants, a high number of the recorded entities of the national economy per 1,000 inhabitants, high gross domestic expenditures on the research and development activity per capita, a high industrial production per capita, a relatively high procurement of agricultural products and low values of the road network density. Such features are characteristic of Wielkopolskie voivodship (the affiliation grade of 0.895) and Mazowieckie voivodship (0.276). It is a low affiliation grade for Mazowieckie voivodship, but the highest in comparison with all the other conglomerations. Mazowieckie voivodship does not decidedly belong to the generated conglomerations, although the value shows that it bears the most features of conglomeration A.

Conglomeration B has the features structure as follows: average GDP per capita, a low number of employed per 1,000 inhabitants, an average number of the recorded entities of the national economy per 1,000 inhabitants, high gross domestic expenditures on the research and development activity per capita, a very high value of sold production of industry per capita (this feature has the highest value in this conglomeration).

Table 4. The voivodships' grades of affiliation to the 5 classes

Voivodships	A	B	C	D	E
dolnośląskie	0.076	0.057	0.701	0.121	0.044
kujawsko-pomorskie	0.350	0.353	0.084	0.137	0.076
lubelskie	0.094	0.264	0.087	0.143	0.411
lubuskie	0.100	0.150	0.306	0.289	0.154
łódzkie	0.045	0.886	0.020	0.021	0.028
małopolskie	0.117	0.262	0.167	0.148	0.307
mazowieckie	0.276	0.210	0.251	0.139	0.123
opolskie	0.029	0.031	0.047	0.853	0.039
podkarpackie	0.035	0.073	0.060	0.117	0.715
podlaskie	0.104	0.210	0.107	0.317	0.263
pomorskie	0.055	0.056	0.748	0.090	0.052
śląskie	0.177	0.177	0.268	0.200	0.178
świętokrzyskie	0.012	0.033	0.019	0.032	0.903
warmińsko-mazurskie	0.065	0.071	0.108	0.650	0.108
wielkopolskie	0.895	0.043	0.025	0.024	0.013
zachodniopomorskie	0.116	0.115	0.493	0.173	0.103

Source: Authors' calculations based on the DataEngine.

This conglomeration includes: Łódzkie voivodship (0.886) and Kujawsko-pomorskie voivodship (0.353).

Conglomeration C includes voivodships with the following features: average GDP per capita, a low rate of the employed per 1,000 inhabitants (this feature has the lowest value in this conglomeration), a low number of the recorded entities of the national economy per 1,000 inhabitants, low gross domestic expenditures on the research and development activity, high sold production of industry per capita, low procurement of agricultural products and high road network density. The conglomeration includes: Dolnośląskie voivodship (0.701), Pomorskie voivodship (0.748), Zachodniopomorskie voivodship (0.4493), Lubuskie voivodship (0.306), and Śląskie voivodship (0.268).

Conglomeration D includes the voivodships with the following features: low GDP per capita, a high rate of employment per 1,000 inhabitants, a low number of the recorded

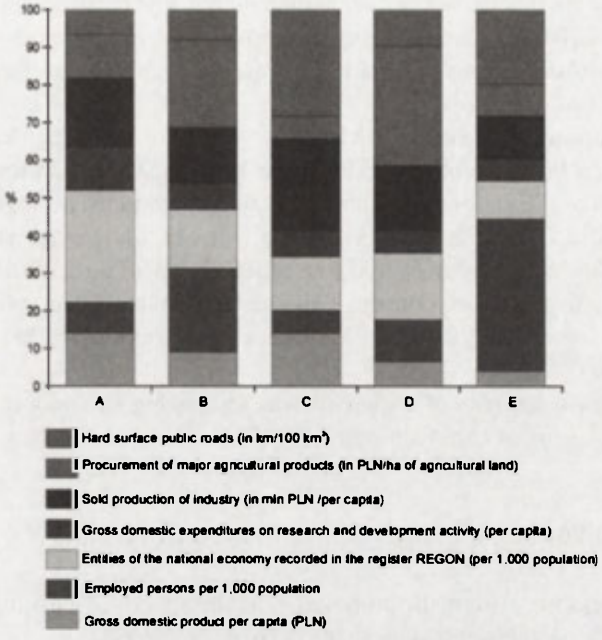

Figure 2. Stake diagram of the conglomeration centres

Figure 3. The classification of the voivodships by means of Fuzzy C-Means Clustering—a division into 5 classes

entities of the national economy per 1,000 inhabitants, low gross domestic expenditures on the research and development activity, a very low value of sold production of industry per capita, high procurement of agricultural products and the average road network density.

Conglomeration E includes voivodships with the following features: average GDP per capita, a high rate of employment per 1,000 inhabitants, a low number of the recorded entities of the national economy per 1,000 inhabitants, average gross domestic expenditures on the research and development activity, an average value of the sold production of the industry per capita, low procurement of agricultural products and the average the road network density. This includes Małopolskie voivodship (0.307), Świętokrzyskie voivodship (0.903), Podkarpackie voivodship (0.715) and Lubelskie voivodship (0.441).

For comparative analysis of regions it was interesting to conduct the analysis of degrees of membership of each region to every cluster.

COMPARING VOIVODSHIPS USING FUZZY KOHONEN NETWORKS

Kohonen Networks were originally proposed as an unsupervised learning network with a competition and a neighbourhood mechanism (Kohonen 1997).

Unsupervised learning of neural networks means that for the input data, as provided for training a correct answer is not being presented. The network is not being informed what output signals should correspond to the input signals introduced. The network training takes place in a self-learning process.

Competition is understand such that neurons learn how to recognise input signals and how to react to such input signals while competing among themselves. A neuron that most strongly reacts to a given input signal, i.e. the more similar the weights of a neuron to input signals the stronger the reaction, 'wins' the competition of recognising those input signals. The neuron that has once 'won' a competition of recognising certain input signals will more and more strongly react to the same or similar signals. Other neurons 'win' and recognise the strongest the other input signals. In such a manner, neurons become 'specialists' in recognising certain input signals in a process of learning the network.

The neighbourhood mechanism forces (implies, causes) that the neurons which react similarly on signals are neighbours in the output layer of the network. This is because the neighbours of 'winner' neuron must learn together with it. The neighbours are taught to react to an input signal recognised by the 'winner', however less intensively that the 'winner' itself, no matter what weights and input signals they have initially had. Their reaction to an input signal, which is recognized by the 'winner' will, therefore, be always somewhat weaker than that of the winning neuron. Nevertheless, as a result of such training of the network, the neighbouring neurons will react to the similar input signals.

The trained Kohonen network is composed of neurons specialising themselves in recognition of different input signals. This is illustrated with the aid of the so-called Kohonen map showing how particular neurons react to input signals. The convergence of a learning process is controlled with parameters: *Learning Rate* and *Learning Radius*.

Therefore, there is no guarantee that the network can learn, and actually learns, and that it will reflect the overall complexity of a problem. The result of the network training depends on the order in which learning examples (observations) are given for training, since the weights of neurons are determined following presentation of each subsequent observation. In order to overcoming the above stated disadvantages, the Kohonen network training method has been improved by combining with Fuzzy C-Means algorithm. Learning rates are calculated using membership values of observations to the individual neurons. Such a combination of Kohonen Networks with Fuzzy C-Means is called Fuzzy Kohonen Networks (Tsao et al. 1994), (Zimmermann 1999). In the course of training of Fuzzy Kohonen Networks, a learning rate of Kohonen network is significantly determined in a dynamic way with the aid of a Fuzzy C-Means step. There is no adaptation of neighbourhood. The is a significant difference, as compared with the algorithm of Kohonen network training since in Fuzzy Kohonen Network, in each learning step all observations (examples, data from training set) are taken into account. The Fuzzy Kohonen Network is therefore taught with the application of a cumulative strategy, while the Kohonen network relies upon learning via single steps.

The learning process is controlled with the aid of two parameters: exponent m and exponent step Δm. The exponent corresponds to an exponent in Fuzzy C-Means clustering, the exponent step supervises magnitude and speed of adaptation of the weights of neurons. Similarly as in Fuzzy C-Means clustering method, the convergence threshold ε is also assumed.

The learning method retains self-learning characteristics of Kohonen net, but instead of using of the neighbourhood mechanism for the adaptation of weights directly, a single learning rate is calculated for each neuron, with the use of current exponent. In such a case, the learning effort falls to a 'winning' neuron. The decrease of the exponent's value (by subtracting the exponent's step after each training) results in the fact that $m \rightarrow 1$, i.e. learning is concentrated on a 'winning' neuron. In an extreme case, when exponent m is equal to 1, only a 'winning' neuron would be trained. However, since the neighbourhood of neurons on the map is not considered directly, a property of Kohonen network consisting in the fact that neighbouring neurons represent similar objects is not retained.

The learning process is independent on the order of presentation of training examples to the network (as is in the case of Kohonen network). It happens so, because all training examples (observations) are reviewed at each step of learning.

The learning algorithm of the fuzzy Kohonen network consists of the following steps (according to DataEngine): initialisation of weights for each neuron and evaluation criterion using random numbers, calculation of degrees of membership to the individual neurons of each training examples (enterprises)—in that calculation distances of observations from neuron weights are obtained using Euclidean measure and *learning rate* using membrship values is obtained, next adjustment of the weight vectors for neurons take place and new m is calculated. If new m>1.0 and Euclidean distances between weights in successive training epoch (epoch means one single presentation of all the training examples) new iteration of algorithm begins (without initialisation of weights step).

Thanks to using Fuzzy C-Means in learning algorithm, the shortcomings of Kohonen network are eliminated. Moreover, it appears that convergence of the learning are

improved and less cycles of training are needed. This fact can be considered as an considerable advantage over the original model of Kohonen network (Zimmermann 1999; DataEngine 2002).

The algorithm is resistant (stable) to the changes in the initial values of exponent and exponent step parameters; changes have only limited influence upon the results of training.

If exponent step is equal to 0 and the number of neurons on Kohonen network is equal to the number of classes, the algorithm is equivalent to Fuzzy C-Means algorithm. However, if there are more neurons than the expected classes, Fuzzy Kohonen method gets the better of the 'fuzzy' algorithm of C-Means as more than one neuron may represent a class, and thus more complex boundaries of classes can be analysed and more complex structures can be studied. In Fuzzy Kohonen Networks it appears that convergence of the learning is improved and less cycles of training is needed. This fact is admitted as an considerable advantage over the original model of Kohonen network.

In study of regions, the network is trained so as to specialise its neurons in recognising the voivodships with different values of five attributes. In our paper, a network composed of 3 x 2 neurons, i.e. 3 neurons per each dimension, is presented. Network training parameters were assumed as follows:

- *Initial values of weights.* A method of random initiation of weights was used. Random numbers originate from 0... 1 interval.
- *Exponent.* Exponent controls the 'fuzziness' of the process. Its value is reduced in the course of network training, and therefore its initial value must not be too low. It should be higher than one. In the study presented, the initial value 4.0 was assumed.
- *Exponent step.* It is a value by which an exponent is reduced at each step of learning. The algorithm is stopped when an exponent attains value which is equal to or lower than one. Exponent step must not be too high in comparison with the exponent. Its value was assumed as 0.02.
- *Convergence threshold.* It determines a condition for the algorithm's action to be finished. The algorithm completes its action if the changes in weights are equal to or lower than the convergence threshold. The convergence threshold 1E-6 was assumed.

At each step of learning, a new matrix with membership values is calculated. For determination of a matrix, all learning examples (voivodships) are used (therefore, the presentation order of learning examples to the network is insignificant). For network training, a data set containing criteria, the same as in the case of fuzzy clustering, were analysed. In order to avoid the 'weighting' of variables resulting from the differences in the measurement scales applied within particular criteria, the normalization of variables was applied so that all the indicators have values in the interval [0;1] (similarly as in Fuzzy C-Means Clustering analysis). After assigning names (labels) to neurons in the network, we can see on the Kohonen map, how particular neurons specialise in recognising regions of different condition. Such a map is shown in Figure 3. The weights of neurons represent values of characteristics of regions to recognise of which particular neurons specialise. Each neuron represents regions with particular level of attributes.

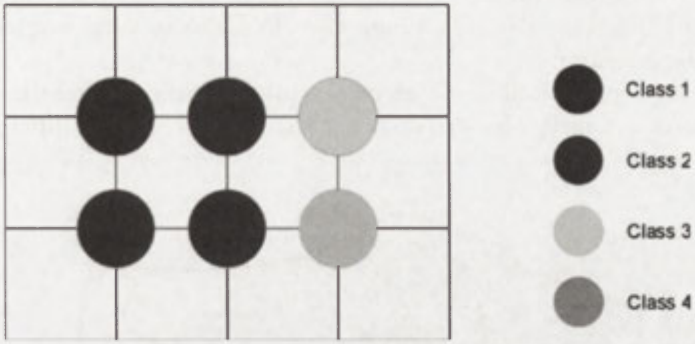

Figure 3. Kohonen map for the comparative study of the socioeconomic situation of regions

After carrying out a network training, the neuron weight matrix that specialises in distinguishing the values of the voivodships' features was obtained. With regard to its size it is not presented here. After naming (labelling) the neurons in the net we can see on the so-called Kohonen's map, how the respective neurons specialise in distinguishing the voivodships of different social and economic type due to the settled features (Figure 3). One neuron can distinguish many objects. The neurons represent the so-called class centroids.

The 1-2 neuron represents class I, the 1-1, 2-1, 2-2 neurons—class II, the 3-2 neuron—class III and the 1-3 neuron—class IV.

The 1-2 neuron identifies only Mazowieckie voivodship (class I) with significantly different values of the features in comparison with the remaining voivodships with the following features: the highest value of GDP per capita (the highest weight), the low rate of the employed per 1,000 inhabitants, and very high values of the following features: entities of the national economy per 1,000 inhabitants, gross domestic expenditures on the research and development activity (the highest weight), sold production of industry per capita (the highest weight), the average procurement of agricultural products and the last weight indicates the average road network density.

The 1-1, 2-1, 2-2 neurons identify Wielkopolskie, Kujawsko-pomorskie and Łódzkie voivodships comprised in class II. The following structure of the features is typical of this class: the average GDP per capita (the highest weight), the high rate of the employed per 1,000 inhabitants, and average values of the following features: entities of the national economy per 1,000 inhabitants, gross domestic expenditures on the research and development activity, the value of the sold production of industry. The procurement of agricultural products has the highest weight of this feature. The road network density is on the average level.

The 3-2 neuron identifies class III including Pomorskie, Zachodniopomorskie, Lubuskie, Dolnośląskie, Opolskie, Silesian and Małopolskie voivodships. The values of all the features in this group of voivodships are on the average level.

The 1-3 neuron has identified Warmińsko-mazurskie, Podlaskie, Lubelskie, Podkarpackie and Świętokrzyskie voivodships. Class IV shows very low weights for all the features under investigation.

The technique of the Kohonen's neuron networks has been used for the voivodships' division in respect to their social and economic features into classes of different values of these features.

Figure 4. The classification of the voivodships by means of Fuzzy Kohonen Networks—a division into 4 classes

SUMMARY

The explanation of multi-criteria social and economic differences in the review of the voivodships requires the choice of specific research methods (Nowak 2004). Two such methods have been presented. Both methods—Fuzzy C-Means Clustering and Fuzzy Kohonen Networks—have brought out approximate but yet different results. They also document a widely accepted point of view that different features of the objects and the applied methods determine the results of the classifying objects and features within the same cluster. Subjective choices occur in each method.

Fuzzy C-Means Clustering method allows considering a different level of affiliation to the classes. Five classes have been distinguished, since such a number resulted from the interpretation of the rate of the conglomeration quality. In both methods the first class includes the same voivodships with the highest and the lowest level of social and economic

development. Mazowieckie voivodship has the highest weights and Podkarpackie, Lubelskie and Świętokrzyskie voivodships—the lowest weights.

The applied Kohonen's unindirectional network of neurons has distinguished four conglomerations that we refer to as classes. Monostructural class I includes Mazowieckie voivodship. Class II comprises Kujawsko-pomorskie, Wielkopolskie and Łódzkie voivodships. These voivodships have high values of the procurement of agricultural products. Class III includes the voivodships in the southern Poland: Małopolskie, Silesian, Opolskie; Dolnośląskie voivodship westwards and Lubuskie, Zachodniopomorskie and Pomorskie voivodships northwards. Class IV includes the eastern voivodships: Podkarpackie, Lubelskie, Podlaskie and Warmińsko-Mazurskie. They share the same feature—they all have low values of all the features being examined. From the geographical point of view the results of Fuzzy Kohonen Networks method were most interesting. The classes taking into account the spatial continuity (social and economic regions) were created. The Fuzzy Kohonen Networks method presents the objects of the similar features in many nodes of the neuron network. In the case of the presented network these are the neighbouring nodes, which is particularly helpful in regional analysis.

The comparative study of the socioeconomic situation of provinces is one of the practical applications of an intelligent fuzzy data analysis: Fuzzy Clustering method and Fuzzy Kohonen Networks method. Both methods seem to be suitable for comparing the socioeconomic situation of provinces. In all the test cases considered so far we have obtained reasonable results. The application of Fuzzy C-Means Clustering enabled to refrain from making a judgement whether a given province belongs or not to a certain cluster or group (as in a traditional cluster analysis). This method helps to determine a lower or higher degrees of membership of province to various clusters or groups of various socioeconomic situation. Such an approach, is a reflection of reality since it prevents assigning individual province to only one cluster or group, as if 'by force', which results in losing a considerable amount of information in the course of clustering. The Fuzzy Kohonen Networks method allows the description of clusters by more than one representative (neuron), enabling the identification of structures in data sets. Both methods do not require any assumptions concerning the nature of the input data. Nevertheless, they require arbitrarily determined parameters. In the case of Fuzzy C-Means method they are: measure of distance and number of clusters into which enterprises are subdivided (*pc* and *pe* quality indicators only partially permit the solution of the problem), whereas in the case of Fuzzy Kohonen Networks method these are: parameters related to the network configuration (such as network dimensions, number of neurons) and network training parameters (such as initial values of weights, exponent, exponent step, convergence threshold). None the less it should be stressed that while modifying the parameters within certain limits some basic conclusions remain essentially unaltered. Basic disadvantage of both methods is that we can obtain many different clustering results depending on the choice of criteria, criteria weighs, various number of clusters and various parameters of the methods. They often require some experimental search, and depending on the context of the application, we may then be able to produce the 'best' clusters for the ultimate purpose. A certain disadvantage is the fact that in Fuzzy Kohonen Networks, neurons representing one cluster do not group together on Kohonen map (as is the case in the non-fuzzy version). In

turn, Fuzzy Clustering may only represent spherical clusters. Condition sine qua non for the application of both methods described in this article for the comparative analysis of the situation of regions is possession of the data set permitting the formation of clusters (Fuzzy C-Means) or network training (Fuzzy Kohonen Networks), and correct selection of criteria for the evaluation of regions. In the selection of criteria, traditional methods of statistics (descriptive statistics, correlation analysis, discriminant analysis) may be helpful. A 'good' network, that is with the level of error acceptable for us in a given application (test error), can be obtained by modifying the formerly trained network. For the sake of reducing the number of errors committed by the network, some changes in the network parameters, network training parameters, and even in evaluation criteria for provinces may be necessary. The implementation of both methods is only possible in case of good software: the DataEngine program of the German company Management Intelligenter Technologien GmbH from Aachen appears to be user friendly. Although our results show the usefulness of the both methods, some problems remain unresolved and require further research. New methods of computational intelligence (Engelbrecht 2002), data mining (Giudici 2003) and statistical learning (Hastie et al. 2001) seem to be helpful in solving some of the mentioned problems in the article and seem to be apply with good results in regional studies.

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ENVIRONMENTAL DAMAGE AND IMAGE PROBLEMS IN EAST GERMANY

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Key words: East Germany, three country triangle, environmental damage, rehabilitation programme

INTRODUCTION

Before 1990 natural resources in Eastern Germany were exploited with deficient protective measures. That applied for the lignite mining, the intensive and industrially used agriculture as well as the melioration of soils in locations with low soil fertility aside the concentration of industrial locations. Results were negative impacts on the environmental and living quality which caused a strong citizens' opposition against the political leadership under the roof of the Lutheran church and which was a precondition for the political changes.

After 1990 the paradigm of sustainability was developed as the guideline and vision of spatial planning on the state, regional and local level. Out-migration increased in places with high environmental damages like the 'Black Triangle' between Görlitz–Zittau–Turov–Most in the border triangle of Germany, Poland and Czech Republic. Investors oriented towards locations with a positive image. Recultivation and technical re-fitting to reduce the region's image problems were supported by state and EU funds. Many former industrial places have become out of use and brownfields. Unemployment and out-migration are still in a dynamic process.

Counties and associations are developing initiatives, which support the inhabitants' identification with their living environment with the help of a determined revitalization of the man-made environment and so called cultural landscapes. At the same time it can not be acted on the assumption of achieving desired goals which tie in with successful time periods of the past. It must be the goal to achieve a new balance of the current economic, social and ecological conditions, which bases on local and regional values and behaviour patterns. These efforts enhance the population's self-confidence and assure a positive image for the region's perception from outside.

INITIAL SITUATION—THE BLACK TRIANGLE

In order to secure the GDR's basic energy supply, the government made big investments in opencast lignite mining. Increasingly, resources and effort were diverted from rehabilitation and recultivation, being applied instead to the extraction of lignite. Inadequate technical precautions meant that lignite-based power generation and chemical industries led to levels of air-borne pollution in excess of permitted levels. In the lignite areas in central Germany, Lusatia and North Bohemia, the air quality was so poor that it became a health danger. This was reflected in the numbers and types of illnesses being registered, and the relatively short life expectancy; the quality of life was seriously and permanently impaired. The whole environmental situation was so atrocious in the triangular area between the Czech Republic, the GDR and Poland, that it became known as the Black Triangle.

During the same period, information about the environment, and events organised by citizens' groups under the aegis of the Protestant Church led to a growing realisation of the importance of a healthy environment and natural beauty. This pressure from the awakening people was the beginning of a resistance movement against the centralised state power system, and led to some simplification of the GDR planning system. After many years when the publication of details about the environmental situation had been prohibited, in 1986 staff working in the district architect's office were able to bring about a council decision which required the drafting of a general regional plan for the Dresden region (Roch 1997b). Cooperation was required from the relevant subordinate specialist departments of the region. The publication and assessment of the results of the analysis were to be followed by the announcement of rehabilitation and development targets.

Indicators[1] for landscape damage, and in particular, air pollution (Figure 1) with SO_2 and suspended solids, showing the polluters and the damage to forests illustrate the extent and degree of environmental pollution in the Dresden region before 1989. After the peaceful revolution, plans for environmentally-sensitive development in the Saxon and Czech border areas were drawn up (Figure 2) (IfS 1994). Damage caused by long-range smoke pollution and airborne particulates along the crest of the Ore Mountains demonstrates the significant reduction in the quality and the negative effects on recreation, tourism and housing.

Before 1990 these high emissions were caused by the numerous large and medium-sized firms in the Mittelgebirge valleys (Figure 3, with effects on use interference) as well as by mining and power generation; after 1990 environmental protection became a central political concern. The closure of many industrial firms and the emigration of their former workers have had positive effects on landscape rehabilitation as well as leading to an easing of the situation in formerly densely-populated areas.

CHANGES SINCE 1990

The province and regional development policies of the Free State of Saxony acknowledges and embraces the need for environmental protection (Hübler and Cassens 1993), and

[1] Other indicators were the pollution of streams, the ground water, the likelihood of soil erosion, extraction from the soil and the associated waste tips.

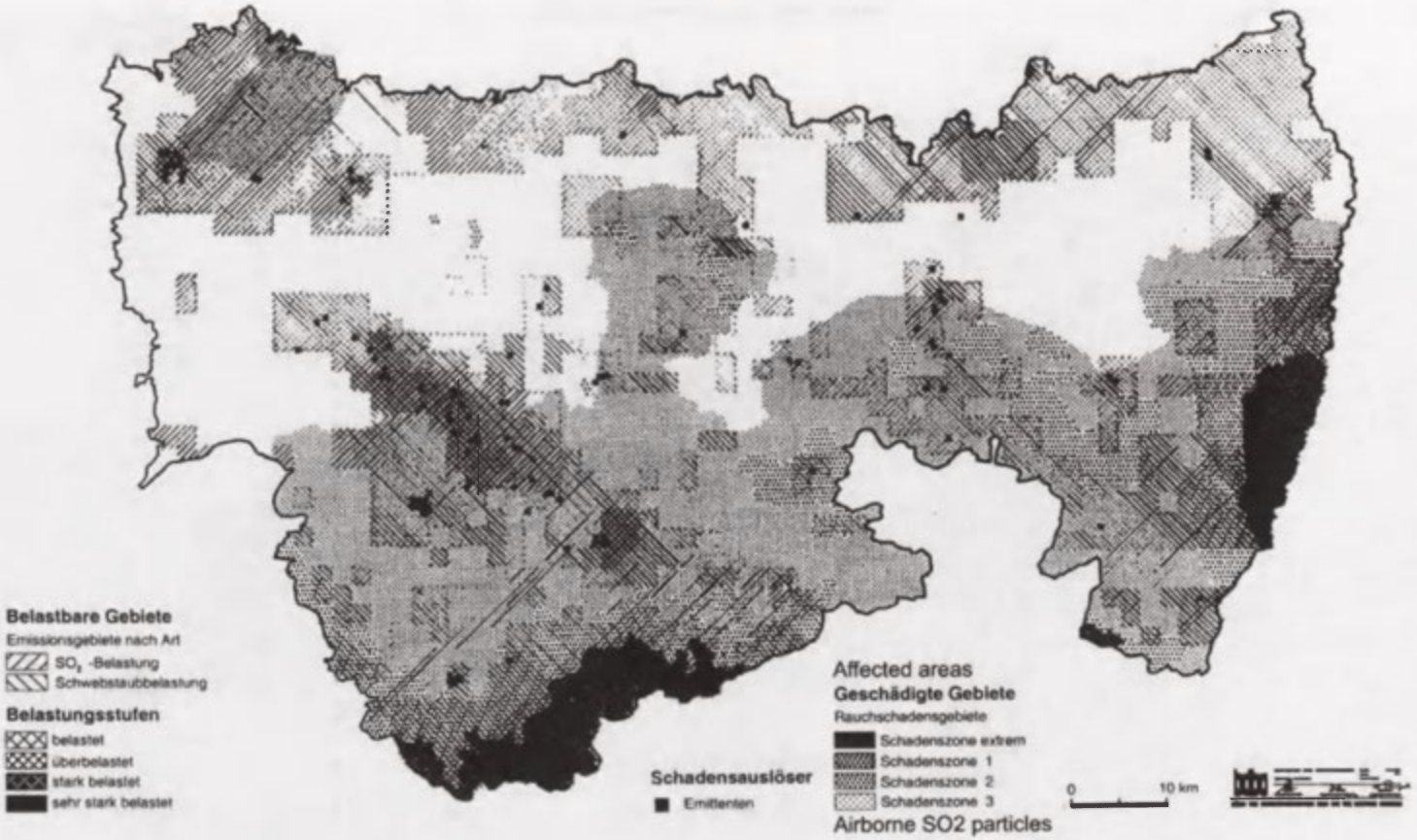


Figure 1. District Dresden—General landscape plan

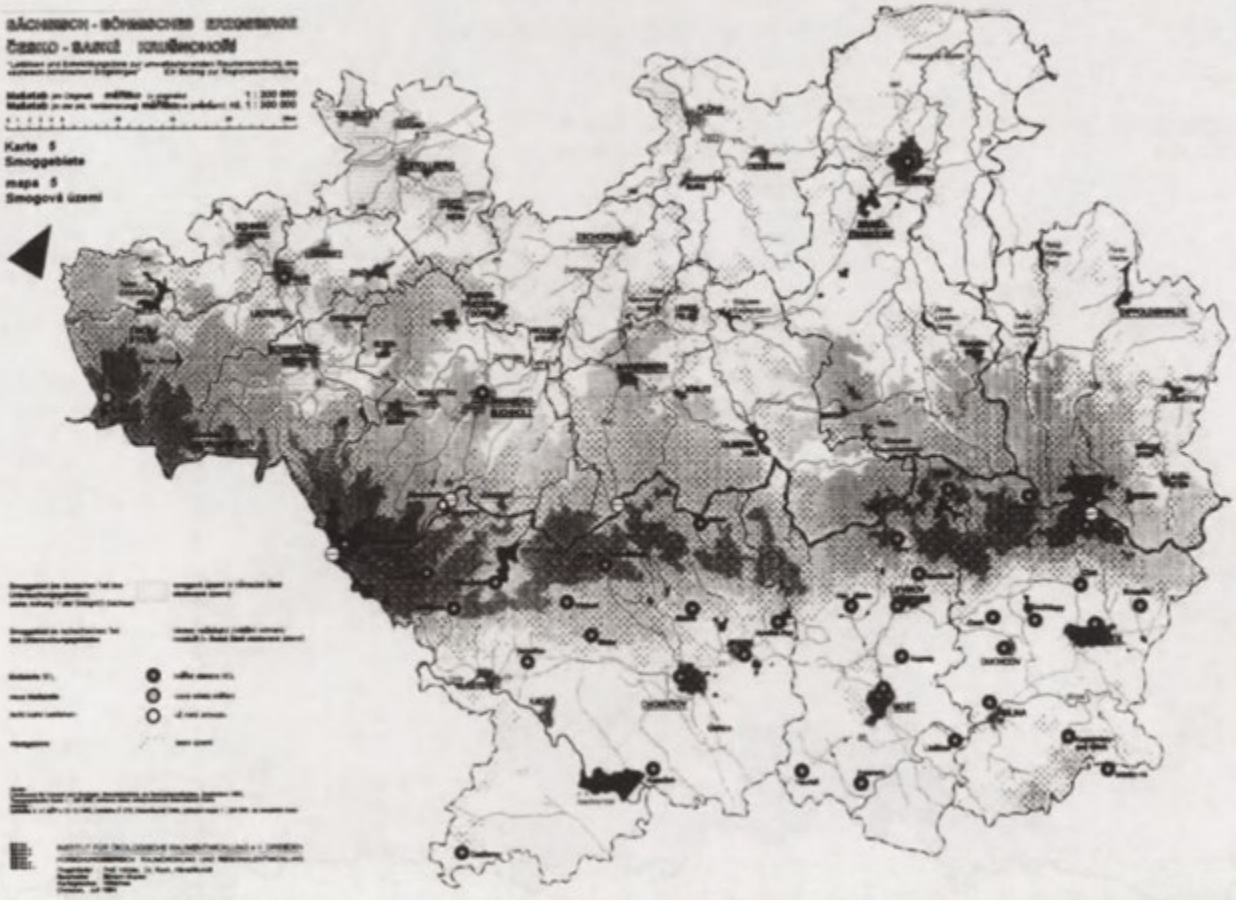


Figure 2. Protected areas and emitter

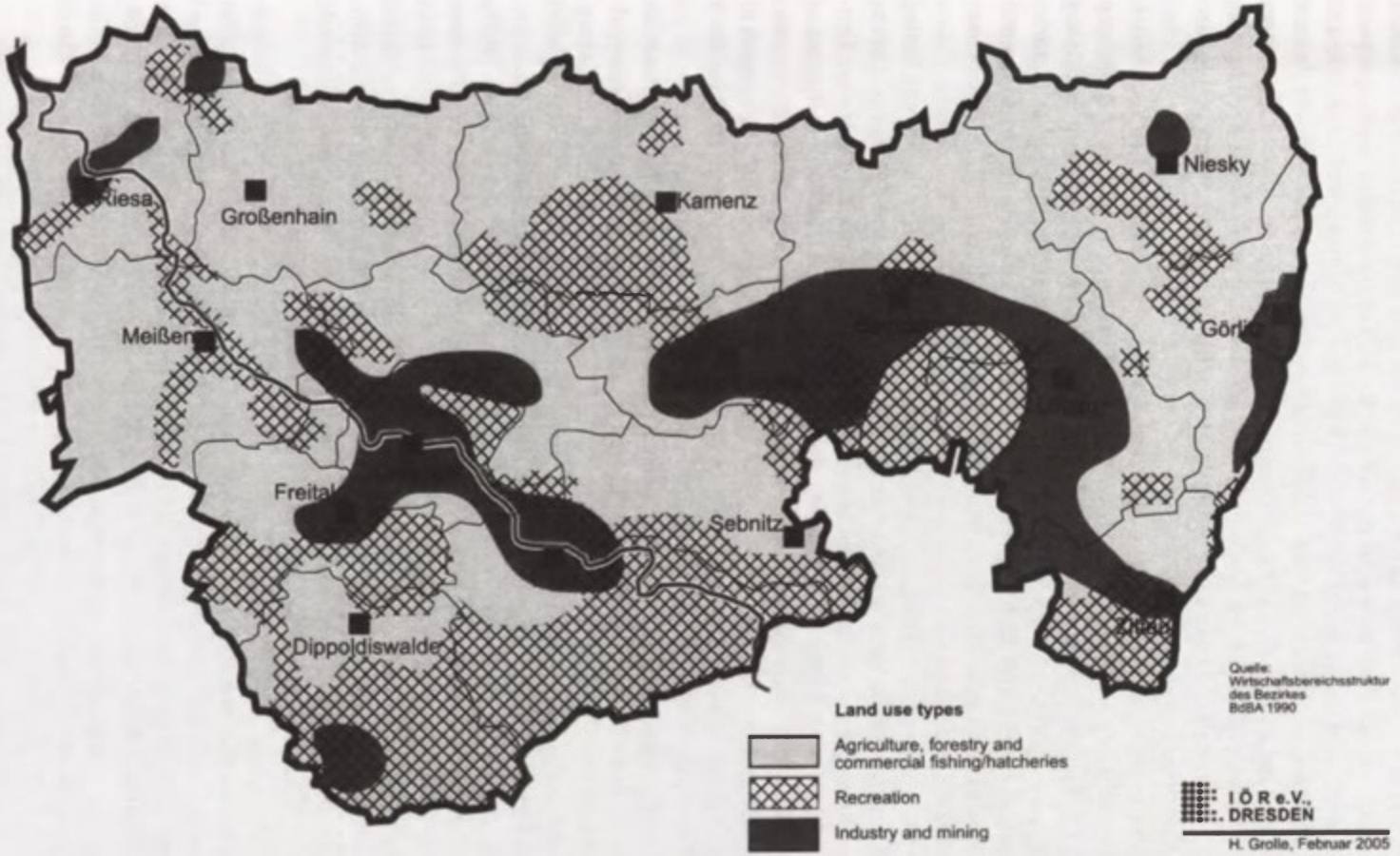


Figure 3. Land Use conflicts in the Dresden Region

the revitalisation of the damaged areas. The ecological plan of the provincial government (Roch 1993) requires the linking of biotopes as a target of the general landscape plan. The press reported on the 'green strips' which link Saxony's biotopes with landscape and conservation areas. At the same time, public buildings such as schools and hospitals were given help to install modern heating systems. In response to the pronounced smog danger in valley towns, pollution from domestic heating was reduced as oil or gas-fired heating systems were installed. Power generating plant was retro-fitted with flue-gas desulphurisation equipment.

A similar approach was taken in combating the serious pollution of surface water. Cleaning the waste water before its discharge into the drainage system was begun; step by step, local authorities built sewage plants; and the requirements placed upon industry became more rigorous. A large number of industrial polluters disappeared as factories shut down. Following such technical measures and economic changes, the environmental situation soon improved. After three years, the environmental reports of the three countries confirm these successes.

Forest damage required long-term rehabilitation measures. These began with liming the soil, removing dead trees, and other forest rehabilitation measures. The causes of the damage along the crest of the Ore Mountains and the Görlitz region (Figure 1) were identified as long-range pollution from the North Bohemian basin. Discussions directed at its elimination were necessary, and indeed took place between the government commissions. Rehabilitation programmes for the Black Triangle were started with the support of the World Bank[2]. These effective changes in direction brought with them the need for a reconsideration of the countries' energy plans and the different locations.

In Saxony, opencast lignite mining and power generation in the Berzdorf-Hagenwerder area came to an end. The post-mining landscape in Olbersdorf by Zittau und Hagenwerder was rapidly rehabilitated and replanted as power generation was transferred to Boxberg. The work of rehabilitation was further helped by the cross-border cooperation with Poland and the Czech Republic. Between 1992 and 1995 development plans for the Bavarian-Saxon-Bohemian border area were drawn up and adopted by the local legislatures. Plans for environmentally sensitive development for the Saxon-Bohemian Ore Mountains were drawn up as a research and development study. This development study was adopted and financed by Germany, the Czech Republic and the Free State of Saxony. Plans were drawn up for the border areas along the German-Polish border at the request of the German-Polish spatial planning commission. The members of the German-Polish team and people in the border area welcomed the plan's aims of developing the natural environment.

Collaboration was particularly successful in such areas as conservation, rehabilitating damaged areas, preserving natural resources–in particular drinking water protection and reserve areas. The cross-border linking of government-protected natural areas and the integration of devastated mining areas into the recreational and leisure landscape system (*Bundesministerium für Raumordnung, Bauwesen und Städtebau Bonn* 1995: 60, 73). These measures, involving the organisation of green strips along the Oder and the Neisse, combined with support for water-related leisure activities and the construction of

[2] The damage was so severe as to exceed the resources available in the neighbour Czech, Polish and Saxon states.

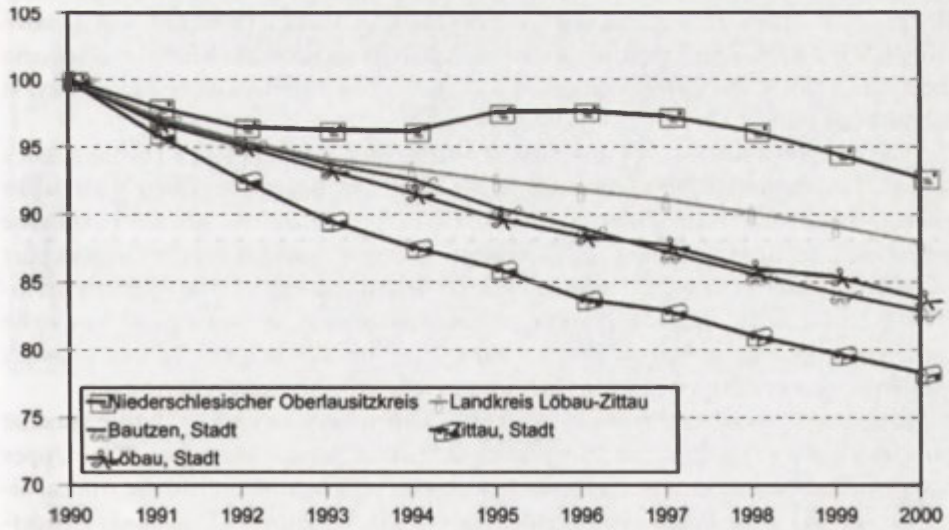
a network of cycle ways characterised a new positive image. 'Bridge projects' organised by conservationists, historic monument preservationists, and youth groups gradually reduced the old, separating, effect of the rivers, giving them a new significance as symbols for contact and connection.

At the same time far-reaching economic and social processes of change were taking place. In the German part of the three country triangle not only were the lignite mining industry and the power generating industries shut down, but many jobs related to these industries were lost. Efforts were being made to privatise the Frottana textile and the damask weaving combines, both of which had previously produced goods for export, employing women from a catchment area of 80,000 km², as were the Robur machine tool factories and the food industry, which had all been important in the region.

In agriculture, the labour intensity fell from 15 persons per 100 hectares to approximately 6. After privatisation the large economic units of approximately 7,000 hectares survived. Labour-intensive vegetable production with irrigation was unable to cover its costs[3]. Drinking water and energy, which had formerly been scarce, ceased to be limiting investment factors as industrial requirements fell sharply, and price increases led to people being more thrifty with resources.

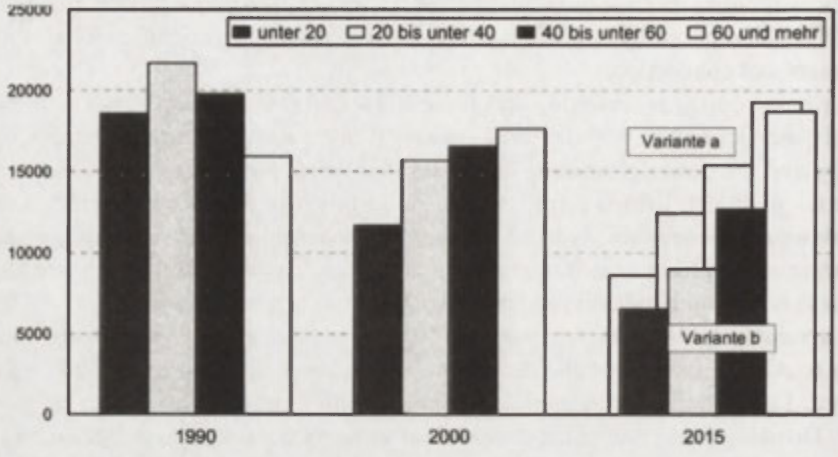
The economic reorganisation processes caused several waves of migration. At first younger segments of the population without close family ties or responsibilities moved out to new jobs or apprenticeships. Other waves followed. Tables 1 and 2 show the changes in district and city population structures. The big reductions in the district main towns of Zittau, Bautzen and Löbau were surpassed by those of Görlitz, which is particularly hard-hit by outward migration, the falling birth rate, and the ageing process. Two possible sets

Table 1. Change of population in the district of Upper Lusatia



[3] Caused by the new rates of pay and the increased cost of water.

Table 2. Change of age structure in the city of Görlitz



Source: Statistisches Landesamt Sachsen, eigene Berechnungen Banse/Eichhorn Görlitz Stadt 2030.

of changes in the age structure from 1990 to 2015 have been calculated; they are shown in Table 2.

For 30 years, urban planning has been emphasising the rehabilitation of historically valuable inner cities with their numerous historic buildings and groups of buildings in a variety of styles. Since 1990 this has intensified with the support of the German government. The principle of urban rebuilding involves a rebuilding process from the outside towards the centre. The rebuilding process in the Königshufen housing area remains controversial. This housing area was developed in the 1980s as a site for people from devastated mining areas and decayed inner city housing. There is little readiness to move from Königshufen, where there are well-established social networks which have become more important as the younger generations of children and grandchildren move away, to the inner city.

The large population losses experienced by the cities can be explained by the GDR's policy of concentration. The settlement of labour in new housing was largely an urban phenomenon. The human capital adapted itself to the new conditions. Migration, with the pronounced decline of the birth rate, represents a serious challenge for the German part of the three country triangle, if social services are to be maintained. Local authority tax income is falling; on the other hand, social and technical institutions and services have to be financed. Schools close, and old peoples' homes open up. Slowly, a new balance between the economic structure, population structure, and the infrastructure is developing.

Inhabitants' social realignment, combined with uncertainty about future income prospects, and a new freedom to travel all influenced leisure behaviour. The Upper Lusatian Bergland used to be a popular leisure area with families; it had the cultural attraction of the timber-framed Umgebindehäuser (Photo 1, Figure 4). In spite of considerable progress in the modernisation of holiday properties, demand fell. A further problem arose with the upkeep of the traditional half-timbered houses, or *umgebindehauser*, as

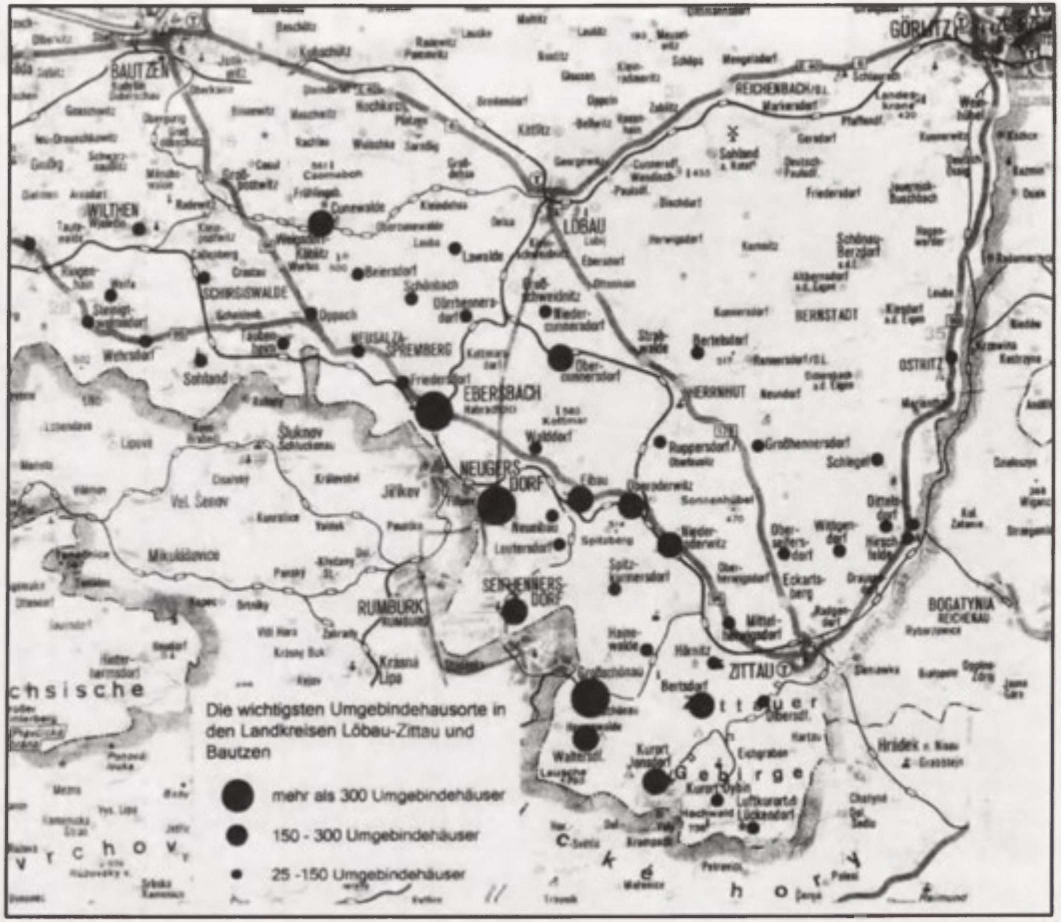


Figure 4. Most important sites of Umgebindehaus-buildings in the districts Lobau–Zittau and Bautzen

the grandchildren, who have traditionally taken over these family properties for generations, have moved away. The disappearance (Table 3) of this particular type of protected local building, characteristic of Upper Lusatia, and which combines Slav and German structural elements, is worrying. Actors in regional development have long recognised the potential of the *umgebindehauser*, and are using them to strengthen feelings of local identity and develop new economic and urban development perspectives.

Photo 1. Example of 'Umgebindehaus'

Table 3. Examples for the loss in inventory during the last 50 years

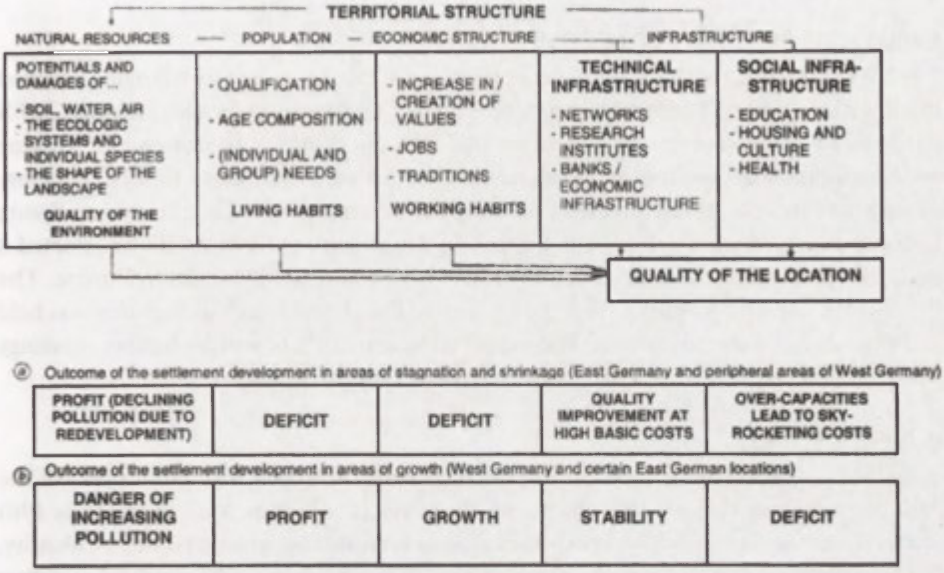
Localities (selection)	'Umgebindehaus' in the inventory in 1955 by C. Saupe (Gesamtzahlen)	'Umgebindehaus' under protection in 2000 (*Source*: Kulturdenkmallisten im Landesamt für Denkmalpflege Sachsen)
Friedersdorf	202	53
Grosshennersdorf	129	42
Kottmarsdorf	88	6
Neugersdorf	512	328
Schönbach	239	69

Source: Inventarisation der Kulturdenkmale durch das Landesamt für Denkmalpflege 1991.

INITIATIVES FOR IMAGE IMPROVEMENT

The initiatives to control the process of change in the three country triangle are oriented toward the development and stabilisation of a robust economic substructure, and effective steps towards overcoming environmental damage some of which have included urban de-

velopments. In stabilising urban development, the influences and interactions of the various subsidiary structures on each other have to be taken into account (Figure 5).The processes of change represent a massive disturbance of the centrally-planned and developed interrelationships between the economic structure, population structure and infrastructure.



(a) Outcome of the settlement development in areas of stagnation and shrinkage (East Germany and peripheral areas of West Germany)

PROFIT (DECLINING POLLUTION DUE TO REDEVELOPMENT)	DEFICIT	DEFICIT	QUALITY IMPROVEMENT AT HIGH BASIC COSTS	OVER-CAPACITIES LEAD TO SKY-ROCKETING COSTS

(b) Outcome of the settlement development in areas of growth (West Germany and certain East German locations)

DANGER OF INCREASING POLLUTION	PROFIT	GROWTH	STABILITY	DEFICIT

Figure 5. The relationship of effects in spatial development

The closure of the big industrial plants has caused migration, which has resulted in the under-use of the infrastructure. The charges for utilities have increased, making the area less attractive to investors. On the other hand, there are environmental benefits. Improved environmental quality is reflected in improved quality of life and attractiveness of the area as a potential industrial location. The environmental successes achieved so far–for example, the joint air quality monitoring in the black triangle, and the easing of travel restrictions–are signals that the image of the area is changing. They need, however, to be more strongly integrated in an image campaign and to bring about a more positive image outside the area.

The strategic aim for this area, which has been so deeply affected by change, must be the establishment of permanent new relationships between the regional substructures based on the relevant spatial potentials. Labour training requirements are oriented toward developing a new spectrum of wealth creation, affecting inward and outward migration. The new wealth creation spectrum brings with it fundamental requirements in the fields of education and research, and the quasi-economic infrastructure. The redevelopment of the housing stock and the quality of residential areas are important for demand-led improvement of living conditions and the area as a potential location, aspects which are decisive for the migration of innovative sections of the population. Housing

conditions have been found to be the second most important factor after jobs in achieving a stable population development (Roch 1989).

The three country triangle has seen the following campaigns established to address and develop the region's spatial potentials: They also contribute to the development of a positive image.

KNOWLEDGE-RELATED FIELD OF COMPETENCE

The SWOT analyses for cross border collaboration in the three country triangle identified the knowledge-related field of competence. Polish, Czech, and German language skills have already been accepted and incorporated into the common education and training systems of the vocational and technical schools in the Nysa/Nisa/Neisse European region. Certificates are recognised after long-term practical training in all three countries. Young Europeans are encouraged to be flexible. The Zittau University Institute has started a number of campaigns to institute a general discussion of training targets in Europe. The first conference with scientists from the associated Polish and Czech universities was held as the countries entered the EU. The expectation is that there will be further meetings which will gradually involve specialists from other European countries.

UMGEBINDELAND

A further potential can be seen in cultural and historical values. The rediscovery of the culture of the weavers' country which, as industrialisation commenced in the early 19th century, saw the heyday of the wood-framed *umgebindehauser*, gives a feeling of identity. Looking back over previous generations' difficulties, successes, and periods of privation is a source of strength and confidence. The present process of regionally-based campaigns and networking comes, basically, from this rootedness in the area as a homeland and an economic area. The consciousness of inherent strengths leads to commitment and creative initiatives, and is perceived by outsiders as a positive characteristic.

The actors in regional development also see a new economic basis in this cultural and historical potential. The 'Umgebindeland Project' sees the cross-border rehabilitation and revival of the cultural landscape as a time-stabilised space which can offer special leisure and tourist activities in a period of rapid change. The relation between recreation and health is, and will be, an element of everyday life. There are plans to revive the old trading routes with their inns in the Umgebindeland (Figure 6, for the area where these buildings are located). Craft workshops and heritage activities fill the old workshop buildings with new life. Land use outside the built-up areas should be oriented towards renewable raw materials and fuels. This programme is not only intended to reconstitute a historical and cultural landscape across modern borders, but also to initiate new forms of cross-border communication.

Appeals are made to emigrants from Upper Lusatia and their descendants to play their part in the maintenance of protected buildings in their former homeland. *Umgebinde* buildings can be rented for varying periods, targeting leisure seekers and descendants of emigrants from Upper Lusatia. A foundation has been established to carry out the renewal of the buildings; its members include the Interior Minister of Saxony, the head of the Saxon department for the protection of historic buildings and monuments, the chief

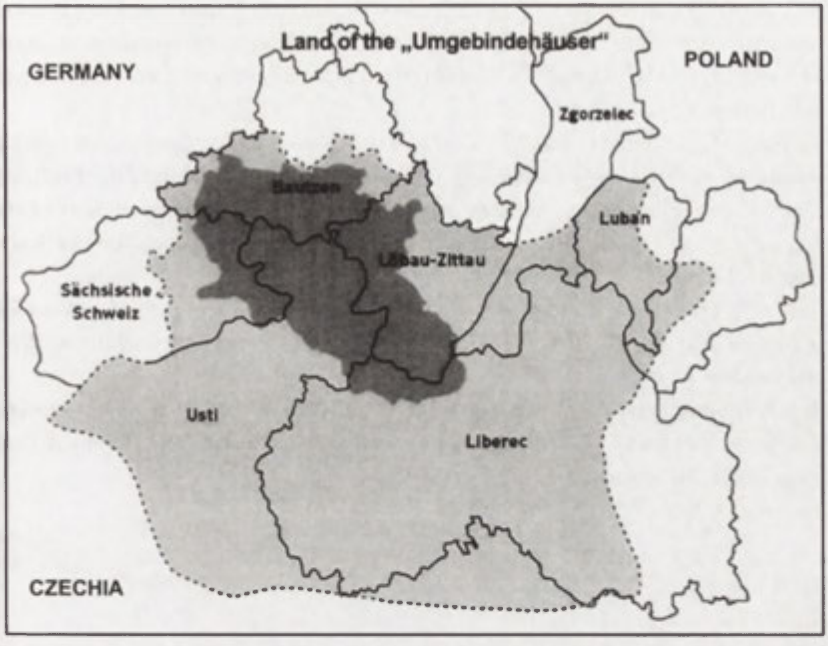


Figure 6. Area of 'Umgebindeland'

administrative officers of Löbau-Zittau and Bautzen, and the public savings banks of these areas.

Both these campaigns tend to develop a positive image for the three country triangle, something that represents a really positive factor for the self-image of the population of the area. Overcoming the negative image of the black triangle is, nevertheless, a long and difficult process. Positive achievements in removing environmental damage, in recultivating the post-opencast mining landscape and urban revival should always be thought of in association with new perspectives for the area as an economic region and homeland. Above all, it is important to convince the younger generation in the region of the new qualities of their common home and to take advantage of their creative talents in developing and implementing new ideas and initiatives for the region.

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REGIONAL CHANGES OF POPULATION AND POPULATION DENSITY IN SLOVAKIA, 1961–2001

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Key words: regional number of population, regional population growth, regional population density, regional changes in density of population, Slovakia

INTRODUCTION

The regional dynamics of number and structural characteristics of permanently residing population is now considered a very sensitive indicator of political, economic and social factors conditioning the competitiveness of regions (Korec 2003). This is the reason why identification of changes in population's distribution is important for the basic research as well as the applied research. The diagnosis of the state and developmental dynamics of population attributed to some spatial unit is the necessary prerequisite when assessing the potential of its socio-economic development.

INDICATORS OF POPULATION'S SPATIAL DISTRIBUTION

In analysis of the state and changes in spatial distribution of population different conventional absolute or relative indicators are applied (Kusendová 2003) where population normally means the permanently residing population[1].

[1] As Fonseca and Wong (2000) assert, the nature of consumed censuses (in case of Slovakia it is also the regular annual updating of the population number residing in individual municipalities) is the cause why permanently residing population was applied. It is obvious that if the present population was taken into account with the census realized on a week day, the population number would be much higher in developed regions with surplus jobs and with a higher degree of amenities which attract the inhabitants of neighbouring regions for short stays. On the other side, less developed regions with insufficient offer of jobs and sub average available amenities where people leave and commute to work and schools in other regions, should show a lower population number. Hence, it is obvious that the results of the spatial distribution analysis of the present population should be certainly interesting and valuable for the rational management of regions and sub regions. This, however, is not the aim of this study.

The absolute, differently structured indicators of the population distribution depict the absolute number of (differently structured) inhabitants in different statistical spatial units, such as e.g. municipalities or districts. Joining of basic spatial units for which the numbers of inhabitants are sought, makes it possible to express the population numbers (number of men, women, children, etc.) for any spatial unit delimited on the basis of varied physical or human geographical criteria (for instance numbers of inhabitants of geomorphic units or numbers of inhabitants of nodal regions). Changes in time and space can be expressed by the difference of absolute numbers of inhabitants who lived in compared time in the territory of identical spatial units. However, the cases when the relative indicator—population growth is applied, are more frequent. This indicator expresses the change of population number compared to certain base population size.

The relative indicators of the population distribution mainly represent the general features of the population density. They define the amount of inhabitants per unit area (usually per 1 km^2) or the opposite value, which is applied in scarcely inhabited areas—the number of square kilometres corresponding to one inhabitant. The same as specific variants of absolute indicator of spatial distribution of population exists, there are also specific variants of relative indicator of spatial distribution of population. The specific population density relates to specific factors, such as the number of economically active inhabitants or those employed in industry, agriculture and/or other branches of economy per unit area, or the number of residents, which inhabit the individual unit areas with different geographical (geomorphologic) and/or socio-economical conditions (rural and urban areas, etc.). The changes in population density result from the overall growth or decrease of population, which in turn depends on both the natural movement (the birth and death balance), and migration (the immigration and emigration balance). The identical spatial unit is also indispensable for time comparisons. In difference of population growth which expresses the change of population number compared to certain base population size, the indicator of change in population density expresses the change of population number in relation to spatial unit. Hence, Fonseca and Wong (2000: 508) believe that 'the measure of population density is a more geographical or ecological index than a simple population change' (p. 508).

AIM OF THE PAPER AND APPLIED STATISTICAL DATA SUITABLE FOR SPATIAL COMPARISONS

The aim of the study is analysing changes in population number and population density not only at the national level, but above all at the regional level during the inter-census periods. Can these measures be voluntarily exchanged and the results interpreted in the same way? Comparison of the results obtained by application of the rate of population growth with the results obtained by the study of changes in population density points to, as far as identification of population change is concerned, the necessity of choice and application of an adequate measure depending on the aim of the study. The selected time period of 1961–2001 includes not only the period of socialist changes, which are manifested by higher natural increase and transfer of part of population into the regions of

economic growth, but also the transition period with its specific conditions for population growth and spatial redistribution of population.

The development of population number and population density in districts (which represent for us the basic referential units) is studied in five years (1961, 1970, 1980, 1991, 2001), when censuses were carried out in Czechoslovakia and in the Slovak Republic. All data are related to former districts delineated according to the territorial-administrative division, which was in force in 1968–1996 and from the point of view of study period, its validity was the longest. Only two exceptions given by the essence of the territorial-administrative division of Slovakia and the criterion of the correct spatial comparison are applicable to spatial allocation of data about population number. It was necessary to create not only approximately equal spatial units. Their inner structure had to be comparable as well. This is why, for purposes of this study, the urban districts of Bratislava and Kosice were attached to their corresponding rural hinterlands (district of Bratislava-mesto was united under one spatial unit with the district Bratislava-vidiek and likewise, the district Kosice-mesto with the district of Kosice-vidiek formed one common spatial unit) creating a kind of 'metropolitan' regions denoted the Bratislava region and Kosice region. A network of 36 compatible spatial units where each of them contains both the urban and rural component was created by the applied methodological procedure.

Another point of preparation related to the effort to obtain compatible spatial units was the assignment of the individual municipalities to territories of districts as they existed in the years 1968–1996—which concerned only the years 1961 and 2001. Summing up the population of the individual municipalities in given districts, the numbers of inhabitants in the quoted two years were obtained. This was the way how the population numbers of spatial units were obtained although some of them (for example Veľký Krtíš, Stará Ľubovňa) were not yet districts in 1961 or which ceased to be districts after the last territorial-administrative division in 1996.

RESULTS

A. THE 1961–2001 PERIOD

In Slovakia 5,379,455 people lived in 2001. The population increased in study period (1961–2001) by 1,205,409 i.e. increased by 28.9%. Population density increased by 24.6 persons per square km and it reached the value 109.7 persons per square km at the time of the last census. Population of the Slovak Republic as a whole grew naturally in particular, based on its own sources while the differentiating element was natality. The share of the population increase in the consequence of immigration was negligible (Podolák 1995).

The continuous growth of population number and population density was sharply differentiated in terms of space and time. The most intensive growth took place in inter-census period of 1970–1980 when population number increased by 10% and the population density increased by more than 9 persons per square km. In this period, pro-natality measures of the socialist population policy were fully manifested and found reflection in more than average values of natural population increase (Andrle and Srb 1983). On the other hand, the smallest population growth (by only 2%) and the smallest increase of

population density (by only 2 persons per square km) is connected with extensive transformation of society in the 1990's characterised by economic and social uncertainty, fall of living standard, increased emigration and absence of measures promoting natality.

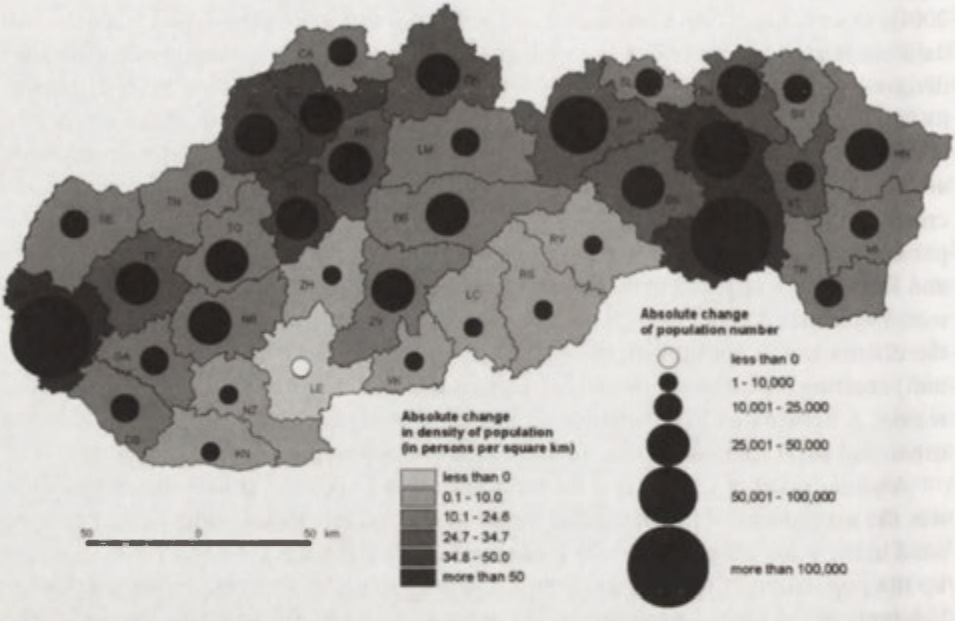

Figure 1. Spatial changes of population growth and population density, (1961–2001)

Spatial differentiation of population growth and changes in the population density during a relatively long period of 1961–2001 is presented in Figure 1. The absolutely highest gain of population number is attributed to the region of Bratislava which has been subject to different phases of artificially promoted population growth—this particularly goes for the city of Bratislava, which was intended to become a 'workers' city'—until it reached the stage of depopulation in the last inter-census period. The region of Bratislava gained more than 190 thousand inhabitants (48.6%) in the 40 year study period. The population density increased by 116.7 persons per square km and reached the value 356.7 persons per square km in 2001.

The relatively more dynamic population growth is connected with the second metropolitan region of Slovakia—Košice region. The population number in region of Košice increased by as much as 81.2%, in 1961–2001, what represents the absolute increase of almost 154 thousand inhabitants. The population density though, if compared with Bratislava region, is half and it reached 193.1 persons per square km in 2001 while the population density increase by 86.5 persons per square km represented about 74% of that observed in Bratislava region.

The only district where population decrease was observed is Levice. Levice is not among the most attractive areas in terms of migration. The district inhabited by a large

portion of Hungarian minority is situated in the south of the country, in a prevailingly agricultural territory at the Slovak-Hungarian frontier. That is to say, the territory, which has been showing features of population stagnation even depopulation for a long time. The causes include accumulation of negative causes of different nature that affect the development of population: demographic composition of population, relative geographical position and consequential location of economic activities, economic backwardness of the region. The specific demographic behaviour of the Hungarian minority characterised by low natality however, is generally considered as the main cause of the present situation and the dynamics of regional population.

From the point of view of the detailed cognition of the development of regional population and regional population density it is appropriate to divide the study period of 1961–2001 into four inter-census periods as presented in Tables 1 and 2.

B. THE 1961–1970 PERIOD

This is the period when population of the region Kosice increased most (by more than 56 thousand—it represented about 15,5% of total change of population number in Slovakia). Population increase was also proper to the most densely population region of Bratislava which increased by more than 51 thousand inhabitants (Figure 2). The increment of 29.6% of the total population increase in Slovakia in the years 1961–1970 is attributable to the two metropolitan regions, the area of which represents only about 7% of the total country's area. In 1970 more than 687 thousand inhabitants (15.2% of the total population number) lived in these two regions. In this way the position of metropolitan regions where only 580 thousand inhabitants or only 13.9% of total population lived in 1961, was strengthened. The rate of population increase in region of Košice was substantially higher than that in region of Bratislava. While the population in region of Košice increased by the astounding 29.7%, when the national average was 8.7 points, the growth rate of Bratislava region, which was more populated at the beginning of the 1960s, reached only 13.1 points. In the background, the period of urbanisation was under way and the two biggest cities of Slovakia, the cores of metropolitan regions, grew in the consequence of immigration above all. Immigration was stimulated by the concentration of economic activities in core cities. In the time of extensive industrialisation concentration of economic activities was accompanied by creation of new jobs (in Košice it was in metallurgy in particular). The subsequent extensive construction of flats inspired by stabilisation of labour forces provoked the migration from rural communes into core cities as well as the movement from the neighbouring districts into centres of economic growth. In the case of Košice above all, the neighbouring districts become sources of labour forces for the developing economy of the city.

The population increase was accompanied by increasing population density in both metropolitan regions. The regional biggest changes, which were almost identical in these two regions (increase by almost 32 persons per square km), were about four times bigger than changes in population density at the national level. However, the population density of the region of Bratislava is still much higher than that of the second region of growth in the east of Slovakia.

The applied model of the socialist industrialisation of Slovakia which relied above all on the development of heavy industry, created spatial patterns which also led to changes of

Table 1. Number of regional population and regional population growth, 1961–2001

District	Abbr.	Number of population					Population growth			
		1961	1970	1980	1991	2001	1961–1970	1970–1980	1980–1991	1991–2001
Banska Bystrica	BB	129116	143172	161619	177654	177893	10.9	12.9	9.9	0.1
Bardejov	BJ	57868	64190	72494	79042	84333	10.9	12.9	9.0	6.7
Bratislava + BA-vidiek	BA	390818	442131	525851	588863	580828	13.1	18.9	12.0	-1.4
Cadca	CA	106393	112861	120375	122687	126621	6.1	6.7	1.9	3.2
Dolny Kubín	DK	84016	93265	106980	119362	130479	11.0	14.7	11.6	9.3
Dunajska Streda	DS	87795	94498	104096	109345	112384	7.6	10.2	5.0	2.8
Galanta	GA	125410	132672	139449	142481	144269	5.8	5.1	2.2	1.3
Humenne	HN	87583	97820	105700	112067	114572	11.7	8.1	6.0	2.2
Komarno	KN	105151	106698	110369	109279	108556	1.5	3.4	-1.0	-0.7
Kosice + Ke-vidiek	KE	189313	245445	301595	334452	343092	29.7	22.9	10.9	2.6
Levice	LE	121032	120251	122240	120703	120021	-0.6	1.7	-1.3	-0.6
Liptovsky Mikulas	LM	112553	118697	126127	131872	133404	5.5	6.3	4.6	1.2
Lucenec	LC	94172	94384	95557	95989	95407	0.2	1.2	0.5	-0.6
Martin	MT	79738	91963	105228	112986	114679	15.3	14.4	7.4	1.5
Michalovce	MI	98796	103271	108404	111376	114399	4.5	5.0	2.7	2.7
Nitra	NR	180590	193776	205697	211517	213671	7.3	6.2	2.8	1.0
Nove Zamky	NZ	144866	148601	153199	153466	149594	2.6	3.1	0.2	-2.5

Poprad	PP	101438	116516	137681	154129	167579	14.9	18.2	11.9	8.7
Povazska Bystrica	PX	125876	139166	153923	169183	172953	10.6	10.6	9.9	2.2
Presov	PO	141693	160559	181502	200245	215849	13.3	13.0	10.3	7.8
Prievidza	PD	100254	114598	128621	138537	140444	14.3	12.2	7.7	1.4
Rimavska Sobota	RS	97350	97716	98638	98987	99800	0.4	0.9	0.4	0.8
Roznava	RV	79435	82154	85622	86311	88482	3.4	4.2	0.8	2.5
Senica	SE	127832	133836	143530	147119	148623	4.7	7.2	2.5	1.0
Spišska Nova Ves	SN	118194	128754	139365	145481	156237	8.9	8.2	4.4	7.4
Stara Ľubovna	SL	37375	39010	42200	46513	50684	4.4	8.2	10.2	9.0
Svidník	SV	35902	37947	41461	44289	45993	5.7	9.3	6.8	3.8
Topoľcany	TO	129867	141117	155908	160767	160734	8.7	10.5	3.1	0.0
Trebisov	TR	108258	113235	117643	118524	122277	4.6	3.9	0.7	3.2
Trenčín	TN	155289	164709	176039	179499	179463	6.1	6.9	2.0	0.0
Trnava	TT	191501	206637	227772	233882	236404	7.9	10.2	2.7	1.1
Veľky Krtíš	VK	45609	44713	45887	46813	46741	-2.0	2.6	2.0	-0.2
Vranov nad Topľou	VT	57029	61808	68585	73681	79078	8.4	11.0	7.4	7.3
Zvolen	ZV	97552	106116	117323	121318	122775	8.8	10.6	3.4	1.2
Žiar nad Hronom	ZH	89235	91166	93271	94052	93988	2.2	2.3	0.8	-0.1
Zilina	ZA	139177	153838	171217	181864	187149	10.5	11.3	6.2	2.9
Slovak Republic		4174046	4537290	4991168	5274335	5379455	8.7	10.0	5.7	2.0

Source: *Sčítanie ludu, domov a bytov 1970, 1980, 1991*, Okresne oddelenia Slovenskeho štatistickeho uradu; *Scitanie obyvateľov, domov a bytov 2001*, Štatisticky urad Slovenskej republiky; own calculations.

Table 2. Regional density of population and regional changes in the density of population, 1961–2001

District	Density of population					Changes in the density ofpopulation			
	1961	1970	1980	1991	2001	1970–1961	1980–1970	1991–1980	2001–1991
Banská Bystrica	62.2	69.0	77.9	85.6	85.7	6.8	8.9	7.7	0.1
Bardejov	57.1	63.3	71.5	78.0	83.2	6.2	8.2	6.5	5.2
Bratislava + BA-vidiek	240.0	271.5	322.9	361.6	356.7	31.5	51.4	38.7	-4.9
Cadca	113.9	120.8	128.8	131.3	135.5	6.9	8.0	2.5	4.2
Dolny Kubín	50.6	56.2	64.5	71.9	78.6	5.6	8.3	7.5	6.7
Dunajská Streda	81.7	87.9	96.8	101.7	104.5	6.2	8.9	4.9	2.8
Galanta	130.0	137.5	144.5	147.6	149.5	7.5	7.0	3.1	1.9
Humenné	45.9	51.2	55.4	58.7	60.0	5.4	4.1	3.3	1.3
Komárno	95.6	97.0	100.3	99.3	98.7	1.4	3.3	-1.0	-0.7
Košice + Ke-vidiek	106.5	138.1	169.7	188.2	193.1	31.6	31.6	18.5	4.9
Levice	78.0	77.5	78.8	77.8	77.4	-0.5	1.3	-1.0	-0.4
Liptovsky Mikulás	57.2	60.3	64.1	67.0	67.8	3.1	3.8	2.9	0.8
Lučenec	72.2	72.4	73.3	73.6	73.1	0.2	0.9	0.3	-0.4
Martin	70.7	81.5	93.3	100.1	101.6	10.8	11.8	6.9	1.5
Michalovce	75.4	78.8	82.7	85.0	87.3	3.4	3.9	2.3	2.3
Nitra	125.1	134.3	142.5	146.6	148.1	9.1	8.3	4.0	1.5
Nové Zámky	107.6	110.3	113.8	114.0	111.1	2.8	3.4	0.2	-2.9
Poprad	51.7	59.4	70.1	78.5	85.4	7.7	10.8	8.4	6.9
Povazská Bystrica	105.2	116.3	128.6	141.4	144.5	11.1	12.3	12.8	3.2
Presov	99.9	113.2	128.0	141.2	152.2	13.3	14.8	13.2	11.0
Prievidza	104.4	119.4	134.0	144.3	146.3	14.9	14.6	10.3	2.0
Rimavská Sobota	53.4	53.6	54.1	54.3	54.7	0.2	0.5	0.2	0.4
Rozňava	49.0	50.7	52.8	53.3	54.6	1.7	2.1	0.4	1.3
Senica	75.6	79.2	84.9	87.0	87.9	3.6	5.7	2.1	0.9
Spisská Nova Ves	77.3	84.2	91.2	95.2	102.2	6.9	6.9	4.0	7.0
Stará Ľubovňa	59.9	62.5	67.6	74.5	81.2	2.6	5.1	6.9	6.7
Svidník	41.7	44.0	48.1	51.4	53.4	2.4	4.1	3.3	2.0
Topoľcany	95.4	103.7	114.6	118.2	118.1	8.3	10.9	3.6	0.0
Trebisov	81.9	85.7	89.0	89.7	92.5	3.8	3.3	0.7	2.8
Trencín	118.6	125.8	134.4	137.1	137.0	7.2	8.7	2.6	0.0
Trnava	137.8	148.7	163.9	168.3	170.1	10.9	15.2	4.4	1.8
Veľky Krtís	53.8	52.7	54.1	55.2	55.1	-1.1	1.4	1.1	-0.1
Vranov nad Topľou	65.8	71.3	79.2	85.0	91.3	5.5	7.8	5.9	6.2
Zvolen	56.7	61.6	68.2	70.5	71.3	5.0	6.5	2.3	0.8

Ziar nad Hronom	70.6	72.1	73.8	74.4	74.3	1.5	1.7	0.6	-0.1
Zilina	126.9	140.3	156.1	165.8	170.6	13.4	15.8	9.7	4.8
Slovak Republic	85.1	92.5	101.8	107.6	109.7	7.4	9.3	5.8	2.1

Source: *Scítanie ľudu, domov a bytov 1970, 1980, 1991*, Okresne oddelenia Slovenskeho statistickeho uradu; *Scítanie obyvateľov, domov a bytov 2001*, Statisticky urad Slovenskej republiky; own calculations.

population distribution. In an effort to minimise the production costs, important industrial companies were situated next to raw material sources or in morphologically advantageous places such as basins with existing population concentration, transport infrastructure and manufacturing units. The territory of the north-western part of central Slovakia where in Považské podolie, Žilinská, Turcianska, and Hornonitrianska kotlina basins a comparatively high concentration of inhabitants existed is a typical example. In 1961 as much as 445 thousand inhabitants (10.7% of total population of Slovakia) lived in heavily industrialised districts of Žilina, Martin, Považská Bystrica and Prievidza, the area of which represented less than 9% of Slovakia's total territory. Up to 1970, the number of inhabitants increased to almost 500 thousand (11.0% of total population). The rate of population growth moved between 10.5 points (Zilina) and 15.3 points (Martin), while Martin was the second and Prievidza the fourth most quickly growing districts in Slovakia. Changes in population density that moved between 10.8 (Martin) and 14.9 persons per square km (Prievidza) were above average. Considering the four industrialised districts of the north-western part of central Slovakia, the population density, which did not reach the average, was only found in district Martin, where unpopulated mountain areas cover the large part of its territory.

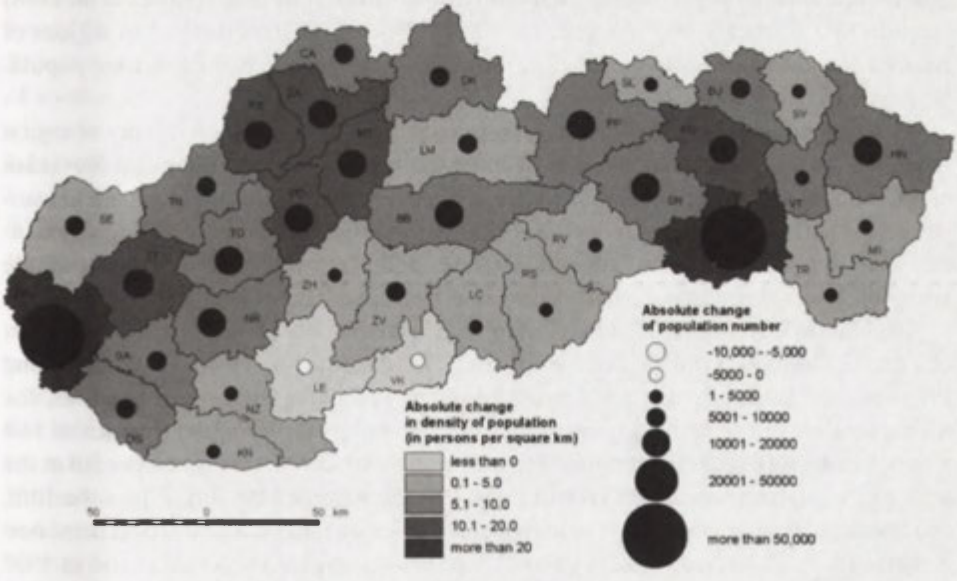

Figure 2. Spatial changes of population growth and population density, (1961–1970)

As far as the population growth is concerned, the backwardness of south Slovakian spatial units is evident. Even in spite of the fact that population decreased only in two districts (Veľký Krtíš and Levice) in the years 1961–1970, the absolute increases and the population growth rates in the rest of south Slovakian districts (Lučenec, Rimavská Sobota, and Komárno) were the lowest and did not exceed 1.5 points. The scarcely inhabited territory of southern Slovakia did not experience any striking changes in population density either and generally it displayed the symptoms of population stagnation.

C. THE 1970–1980 PERIOD

In the years 1970–1980 none of 36 spatial units showed decrease of population (Figure 3). In the 1970s that represent the period of the highest (10.0 points) population growth in the consequence of above mentioned measures favouring natality, the process of population concentration into two metropolitan regions went on. It is the most important piece of information linked to spatial distribution of population. The population increment in the years 1970–1980 was almost 454 thousand inhabitants in Slovakia, out of it, 140 thousand inhabitants in regions of Bratislava and Košice (30.8% of total national increase). The rate of population growth was again higher in region of Košice (22.9%), but, as far as the absolute increase is concerned, Bratislava surpassed Košice and the ratio between them was 1:1.49 (56 thousand: 84 thousand) in the quoted inter-census period. The rate of population growth in Bratislava region (18.9%) was the second highest considering the spatial units studied and it also drew distinctly closer to that of region Košice. In Košice region consequences of certain, objectively existing 'exhaustion of resources' of neighbouring areas started to emerge. This led to the subsequent decrease of migration flows above all to the core city of the region with the highest population growth rate. 'The purposeful building of the second regional centre of Slovakia in the east' (Korec et al. 1998) ran into first obstacles. In 1980 more than 827 thousand inhabitants lived in regions of Bratislava and Košice while the share of these two metropolitan regions in total population increased to 16.6%.

Changes in population density are also interesting. The population density of region Bratislava that was just living the stage of boom was higher than that of the east-Slovakian metropolitan region. The population increase by more than 51 persons per square km surpassed the national average by more than five times. Population density in Košice region increased (the same as in the preceding inter-census period) by almost 32 persons per square km, while it was always about a half of the value corresponding to Bratislava region.

Population increase is also observed in industrial districts of the north-western part of central Slovakia. Growth rates of districts Žilina, Martin, Považská Bystrica and Prievidza are above average and compared to the preceding inter-census periods, the differences are not so distinct (they move from 10.6 points for Považská Bystrica to 14.4 points for Martin). Among the studied spatial units, district Martin ranked the 5th at the scale of the highest population growth rates, Prievidza ranked the 9th, Žilina the 10th, and Považská Bystrica the 12th. Population number in the quoted four districts increased by more than 59 thousand (13.1% of total population increase in Slovakia) and in 1980 it reached the level of 559 thousand persons (11.2% of total population in Slovakia). The changes in population density were also above average and so it is possible to say that the

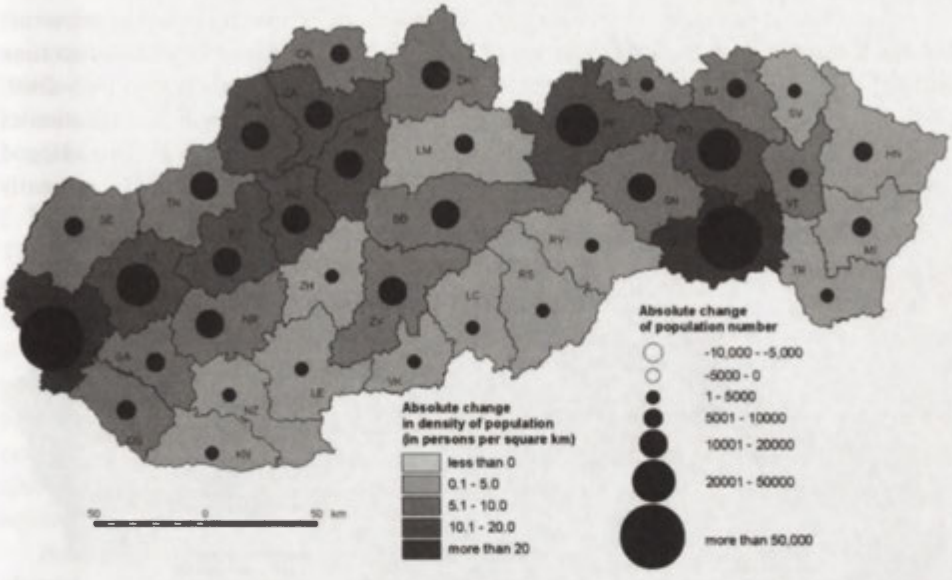

Figure 3. Spatial changes of population growth and population density, (1970–1980)

numerical values point to the persisting trends of concentration of population in the territory of the north-western part of central Slovakia in the 1970s.

The smallest population increases were again observed in spatial units of southern Slovakia (districts Rimavská Sobota, Lučenec, Veľký Krtíš, and Levice). The rates followed the national trend and increased. They moved between 0.9 point and 2.6 points. Population density increase though did not exceed 2 persons per square km. Population of southern Slovakia remained almost untouched by the pro-natality measures and it is why traits of population stagnation are also observable here in period of maximum population growth at the national level.

D. THE 1980–1991 PERIOD

Population of Slovakia increased by 5.7% in the quoted period, and represents the growth in absolute numbers by more than 283 thousand persons. Population density increased by almost 6 persons per square km. Decrease of natality caused the striking slow-down of population growth in Slovakia (Podolák 1995). It was probably the response of Slovakia's inhabitants to increased living cost and the deteriorating economic situation (Andrle and Srb 1989). Regional differences in growth rate and changes of population density reached some balance above all between the western and eastern parts of the country (Figure 4). In the consequence of strengthened economic power of the towns situated in periphery and boundary areas, the migration between regions decreased; migrants started to prefer moving to short distances which did not cross the district boundaries. But partial exhaustion of demographic sources and an overall decrease of mobility causing decrease in spatial redistribution of population were ever more evident (Podolák 1994).

The attractiveness of Bratislava for migrants enhanced by an extra extensive construction of flats, invited migration flows from all over Slovakia. Region of Bratislava first time surpassed the growth rate of Kosice region in the framework of study period 1961–2001. The main reason of this change in ranking of two leading spatial units is stagnation of extensive growth of industrial employment in region of Kosice. Kosice region also lagged behind the northern districts Poprad and Dolný Kubín. The growth in Poprad was greatly

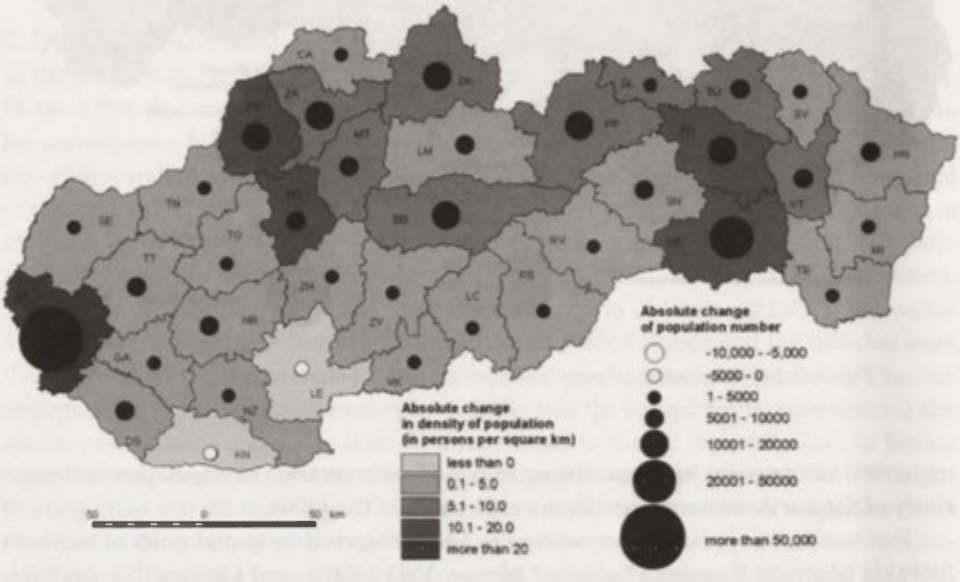

Figure 4. Spatial changes of population growth and population density, (1980–1991)

influenced by demographic behaviour of the Roma ethnicity (above average natality rate) while the growth rate in Dolný Kubín with its traditionally high natality rate was affected by the decreased migration of its population out of the district. The most rapidly growing region of Bratislava benefited not only from the migration flows but also from its newly created own sources what manifested in favourable natural increase. Regional population density has strikingly increased and reached almost 362 persons per square km (threefold over the national average). As far as changes of population density is concerned, the increase of persons per square km in region Bratislava was even 6 times higher than that for the whole territory of Slovakia.

Demographic development of southern Slovakia stagnated and deteriorated as it copied the dropping natality rates of the whole country. The regional population decrease was not dramatic – it concerned only districts Levice and Komárno and the rate of decrease did not exceed the value of 2 points which means the absolute decrease of less than 3 thousand persons in both regional units. The below average population density in the quoted districts has decreased by 1 person per square km. Population density increase in

the majority of districts in southern part of the country was rather symbolic as it did not amount to 1 person per square km. Demographic stagnation was accompanied by economic stagnation (or vice versa) and southern Slovakia with underdeveloped transport infrastructure was in the periphery of interest of new companies, the fact that affected possibilities of its social and economic development.

E. THE 1991–2001 PERIOD

The population growth has distinctly slowed down in the last studied inter-census period, which can be characterised as that of big political, social, and economic changes. Population of Slovakia increased in the 1991–2001 period only by about 105 thousand persons what meant only the 2% growth rate. The decisive effect on the slowed down population growth rate was that of a distinct drop of natality. It was the response of young population to new living conditions, which brought on social and economic uncertainty, and also new life style including the change of traditional scale of values. The notable slow-down also accompanied the changes in population density that increased only by 2 persons per square km a stopped at the level of 110 persons per square km.

A dramatic change occurred in regional differentiation of population growth and in changes of population density (Figure 5). The reason lies in a strong reduction of population's mobility between regions, in a strong reduction of spatial redistribution of population (Bezák 2002). Such a high regional disparity in basic demographic characteristics —age structure and population increase—between the northern and eastern regions on the one hand and western parts of Slovakia on the other (Podolák 1994) explains regional changes in population growth and changes in population density in a decisive way.

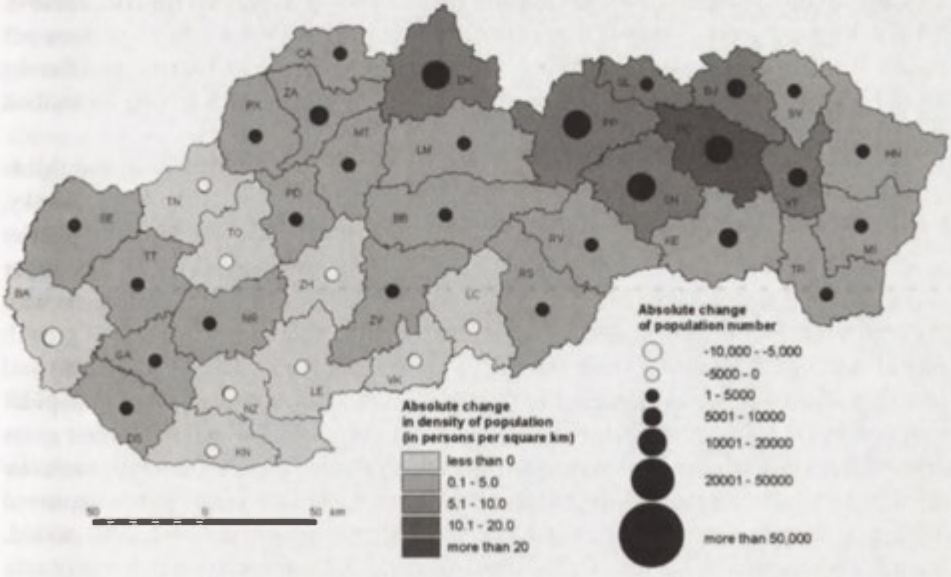

Figure 5. Spatial changes of population growth and population density, (1991–2001)

Population decrease concentrates in the western half of the state which is paradoxically also characterised by a higher level of economic development. The biggest change is connected with the long-term growing Bratislava region, which lost about 8 thousand inhabitants (i.e. 1.4% rate of decrease). Population density decreased by almost 5 persons per square km and it represents the largest loss of all spatial units. The region with highest increases in population density in time of two previous inter-census periods became the one with largest losses of persons per square km.

The centre of region, city of Bratislava recorded the first loss of population between the two official censuses from 1869 (Korec 2003). It was the result of natural decrease and also of migration. The sharp attenuation of construction of flats after 1989 (Bezak 2002) accompanied by enormous price increase of real estates in the Capital reduced migration flows to Bratislava. On the other hand, the well-to-do inhabitants of the Capital leave the city and move to houses in rural area. In spite of it, the ongoing suburbanising process cannot explain the population decrease in region of Bratislava as its moving inhabitants prefer the inner-regional accessible localities in the rural hinterland of the city. The reason of this surprising result lies perhaps in registration of permanent residents. There are a lot of people with practically permanent staying in Bratislava region, but officially registered in other regions of Slovakia. It is difficult to estimate the number of these persons but it is expected that if they registered permanent residence in region of Bratislava, it might lead to an apparent increase of population and population density in this region.

Population increase in the northern and eastern parts of Slovakia is evident. The most rapidly growing districts are Dolný Kubín, Stará Ľubovňa, Poprad and Prešov. The rate of population growth moves from 9.3% to 7.8%. The absolute gains are from more than 4 thousand (district Stará Ľubovňa) to more than 15 thousand persons (district Prešov). Where the population density increased most was in district Prešov—by 11 persons per square km, district Poprad ranked third, district Dolný Kubín ranked fourth, and district Stará Ľubovňa with gain of 6.7 persons per square km ranked fifth among 36 studied spatial units.

In Slovakia there were 9 depopulation regions in the 1991–2001 period, two thirds neighboured with Hungary (region Bratislava and districts Komárno, Nové Zámky, Levice, Veľký Krtíš, and Lučenec). The highest rate of decrease was found in district Nové Zámky (2.5%) and, as already mentioned, in Bratislava region (1.4%). The other depopulation districts did not surpass the 1% rate of decline. In southern districts with the population growth, which also border on Hungary the continuous increase of growth rate in direction from west to east, starting by the district Rimavská Sobota (0.8%) and ending by Trebišov (3.2%) is interesting. However, if the indicator of changes in population density is applied, this continuous increase does not manifest and the largest gains (almost 5 persons per square km) are attributable to Košice region. Generally said, the relative position of southern districts (above all in the east of the country) has improved as regards the rate of population growth and population density in the 1991–2001 period. Higher regional concentration of the Roma ethnicity with above-average natality rate has contributed to it. In spite of it, the relative position of southern districts remains unchanged as far as population number or population density are concerned. Some authors

(for instance Paulov 1996) believe that southern Slovakia has the chance to become a new space for development. Regarding the existing backwardness of this part of the country and partial (including population) potential for regional development though, it will be (according to our opinion) a long-term process.

CONCLUSION

Application of four indicators to expression of population changes and comparisons of results proved to be methodologically useful. Each indicator expresses a different thing and they complement each other. Each of them requires a specific interpretation. Division of the study period into four inter-census periods also brought a useful differentiated view of regional changes in population growth and population density.

The studies which evaluate population changes devote, in author's view without justification, a substantially less attention of changes of population density. Wrongfully. The opinions regarding changes in population density (the same as changes in population number) in the context of life quality of population concerned are not homogenous (Carnahan et al. 1974). If the positive view of increasing population density is emphasized then they are connected with the economic impact of the studied process (economics of scale, economic externalities, networking of individuals and institutions, which lead to promotion of innovation and prosperity, higher level of welfare of locals). The typical example in Slovakia is Bratislava region with the highest economic performance. On the other hand there are numerous authors who rather emphasise negative view connected with the population density increase. These negatives are seen in social and environmental spheres (impairment of physical and mental health of population as manifested by higher occurrence of different forms of social pathology, environmental pollution). Bratislava region is also a good example in this case. Positives and negatives coexist, they are parts of one process and the search for their harmonisation i.e. ideal population density is not only the scientific problem but above all the problem of territorial management. The correct solution will be reflected by subjective perception of high quality of life in the majority of local population.

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TERRITORIAL DIFFERENCES TO THE ECONOMIC TRANSFORMATION IN BULGARIA

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Key words: Bulgaria, economic transformation, wmployment, foreign direct investment

INTRODUCTION

The processes of economic transformation in Bulgaria have been going on for more than a decade. The Bulgarian model of transition to a market economy has its characteristic features, resulting from the specific conditions in the country. Compared to the other Central and Eastern European states, Bulgaria has been characterized by a more distinct process of restructuring. The more profound changes in Bulgaria are due to the much lower share of private ownership (and hence predominant share of state ownership) in the economic sector, present for several decades (1950s–1980s), to the deeper social and economic crisis towards the end of the 1980s and in the first half of the 1990s, to the unfavourable political situation in the Balkans during the first five years of the 1990s, to the wide scope and slower rate of reform, to inadequate capital, to the smaller amount of foreign direct investment, to the more serious obstacles in the formation and functioning of the labour market, etc.

The investigation of these processes at a regional level shows that they differ throughout the country, and that the differences from region to region are significant. These differences depend on the built-up economic potential and its present state, on the degree to which national and local factors (geographical location, economic structure, attractiveness for foreign investments, demographic factors, newly-created jobs, disparities in incomes and living standards, infrastructure, communications, etc.) exert their influence on the pace of reform, etc. Everywhere the transformation started first in the economic sector, and it was the economic changes that altered demographic conditions and employment. Generally, the specificity of the transformation processes results from the overlap of national trends and the specific processes and phenomena present in different parts of the country.

This paper uses, as basic territorial units for presenting the differences in the transformation processes, the six (NUTS 2) planning regions, approved for the first time in 1999. Some of the differences are demonstrated by administrative regions (NUTS 3 districts) as well. The survey has employed some key indices, characterizing in general the development of the regions and the disparities between them. The period with available information (1997–2002/3) is closely associated with the establishment of the planning regions at the end of the 1990s.

ANALYSIS

The individual planning regions embrace areas with different geographical conditions, geographical location and capacities for development, factors which, take together, will allow for their progress. They include between 3 districts (the North West and South East regions) and 6 districts (the South Central and North East regions). The planning regions in Bulgaria are comparable in terms of their area and demographic potential, except for the North West region (Table 1). The largest regions are the South West and South Central ones. They embrace over 40% of the country, and over 50% of its population. These two regions have the most employed persons and the highest employment rate (Table 1), and the most advanced economy—they produced almost 60% of the country's gross domestic product (GDP) (Figure 1). The North West and South East regions are the smallest ones.

GDP per capita during the period under investigation serves as one of the indices, pointing to the degree of transformation and differences between individual regions and districts. The analysis on the dynamics of this index confirms that, during recent years, the differences among the regions have been maintained. On the one hand, the indices in 5 of the regions are similar, and on the other, there is a marked contrast between these and the indices in the South West region (Figure 2). The regional analysis on GDP per capita dynamics shows that until 1999, the South East region was remarkable for its higher values as compared to the other 4 regions, while since 2000 it has been approximating them. The result is that nowadays its figure for GDP per capita is very close to those in the North West, North Central, North East and South Central regions. Very important for the South West region is the location of the 'Sofia-capital city' district within it. This is the district with the highest concentration of economic activities and capacities, both in the region and in the country.

A comparison based on the best to worst positions of planning regions implies that the GDP per capita ratio has remained unchanged over the recent 8 years 1996–2003—about 1.5–1.8 times (Table 2). In this period the South West region had the best position. As a result of the more or less successful transformation processes in the regional economy, a trend is observed towards an increase in differences between the South West region and the second (best) region (Table 2, Figure 2). GDP per capita for the remaining 5 regions does not differ significantly, and that is why they often change positions (Table 3). In certain years one and the same region passes over from the second (best) position to the worst position or vice versa, for example with the North West, South East and South Central regions.

Table 1. Selected indicators for planning regions in Bulgaria (2003)

Indicators	Planning Regions						
	North-West	North Central	North-East	South-East	South Central	South-West	Bulgaria
Surface area (sq.km)	10588	18024	19896	14645	27552	20270	110975
Population ('000 pers.)	512.6	1165.8	1285.8	782.7	1944.4	2110	7801.3
Natural increase (‰)	-11.8	-8.6	-4.5	-3.7	-4.9	-4.9	-5.7
Population density (pers./sq.km)	48.4	64.7	64.6	53.4	70.6	104.1	70.3
Population by working-age status as of 31.12.2002							
under working age (%)	15.6	14.9	16.9	17.6	16.3	14.8	15.9
at working age (%)	55	58.1	60.9	59.7	60	62.1	60
over working age (%)	29.4	27	22.2	22.7	23.7	23.1	24.1
Urban population (2002, %)	59.2	67.5	64.3	68.7	65.2	81.1	69.6
Labor force (total, '000 pers.)	188.1	470.1	542.7	325.6	792.5	964.1	3283.1
Employed ('000 pers.)	157.1	406.5	437.5	272.5	704.6	855.8	3834
Employment rate (%)	35.3	40	40.2	41.4	42.5	47.3	100
Unemployed ('000 pres.)	31	63.6	105.2	53.1	87.8	108.4	449.1
Unemployed rate (%)	16.5	13.5	19.4	16.3	11.1	11.2	13.7

In accordance with the instruction accepted with Decree of Council of Ministries No 30—in 2002: under working age—till 15 years, total; at working age—Males—16–61 completed age and 6 month, Females—16–56 completed age and 6 months; over working age—Males—over 61 completed age and 6 months, Females—over 56 completed age and 6 months.

Sources: Employment and unemployment 4/2003, National Statistical Institute, Sofia, 2004; Reference book 2004, National Statistical Institute, Sofia, 2004.

In regard to districts, a comparison between their positions indicates substantial differences between the best and worst developed of them—GDP per capita in the district of 'Sofia-capital city' exceeds by 3 times the lowest value for this index in the other districts (Table 2). Over the surveyed period, the district differences were almost twice as large as those between the planning regions in best and worst position. It was in 1999 and 2001 that these differences were most appreciable (at 3.02:1.66 and 3.00:1.67 respectively). The investigations conducted by Hungarian researchers also give similar ratios between NUTS2 and NUTS3 regions in best and worst positions in Hungary during the years 1994–2000 (Hrubi 2002).

If the 'Sofia-capital city' district is excluded, the differences between the other districts are considerably mitigated (Table 2). The ratio changes for the districts in best and worst

Table 2. Differences in GDP per capita between planning regions and districts

	1996	1997	1998	1999	2000	2001	2002	2003
Best to worst position of planning regions	1.6	1.63	1.5	1.66	1.59	1.67	1.79	1.67
The best planning regions to the second (best)	1.48	1.03	1.17	1.32	1.4	1.53	1.64	1.53
Best to worst position of districts	2.87	2.21	2.51	3.02	2.63	3.00	—	—
Best to worst position of districts without Sofia cap.	1.92	1.02	1.98	2.00	2.05	1.88	—	—
The best district to the second (best)	1.4	1.02	1.27	1.51	1.28	1.6	—	—

Source: Author's calculation on the National Statistical Institute's information.

positions are insignificant. As can be seen from the analysis, the more frequent changes are those concerning the districts in second (best) position (Stara Zagora, Burgas, Vratsa and even the capital of Sofia in 1997 when Stara Zagora district is ahead) rather than those, relating to the districts in worst position (Smolyan and Kardzhali in the 1996–2000 period).

The analysis on intraregional differences makes it obvious that there are several districts with higher GDP per capita (Sofia-the capital, Stara Zagora, Varna and Vratsa),

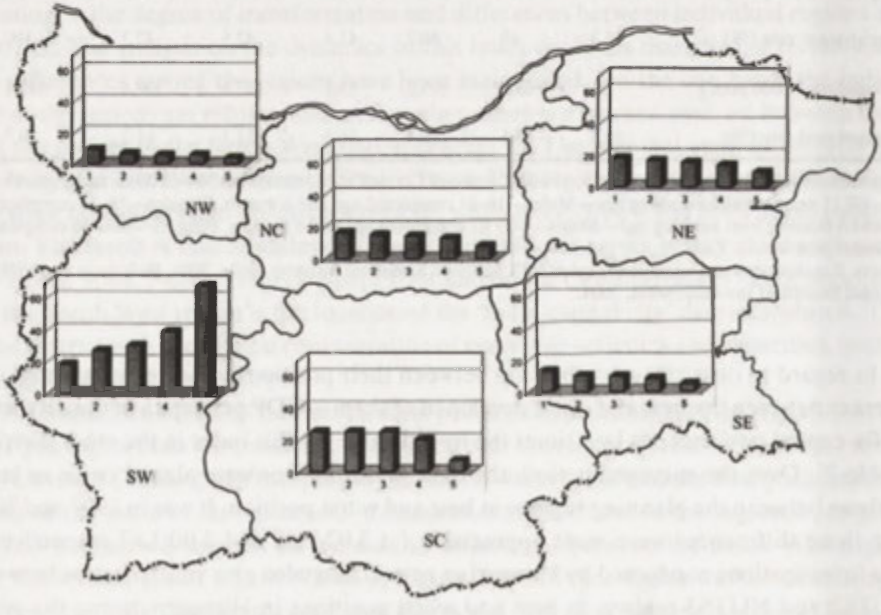

Figure 1. Main indicators for planning regions in Bulgaria

Share from the country's (%): 1—territory, 2—population (2003), 3—employment (2003), 4—gross domestic products (2002), 5—foreign direct investments (2002). Regions: NW—North-West, NC—North-Central, NE—North-East, SE—South-East, SC—South-Central, SW—South-West.

Table 3. Positions of planning regions and districts by GDP per capita*

Year	In the best position	In the second (best) position	In the worst position
I. Planning regions			
1996	South-West region	South Central region	South-East region
1997	South-West region	South-East region	North-West region
1998	South-West region	South-East region	North Central region
1999	South-West region	South-East region	North-West region
2000	South-West region	South-East region	South Central region
2001	South-West region	North-West region	South Central region
2002	South-West region	North-West region	South Central region
2003	South-West region	South-East region	South Central region
II. Districts			
1996	Sofia-capital district	Stara Zagora district	Smolyan district
1997	Stara Zagora district	District Sofia-capital	Smolyan district
1998	Sofia-capital district	Stara Zagora district	Kardzhali district
1999	Sofia-capital district	Burgas district	Kardzhali district
2000	Sofia-capital district	Burgas district	Kardzhali district
2001	Sofia-capital district	Vratsa district	Pazardzhik district

*Arrangement by data from National Statistical Institute

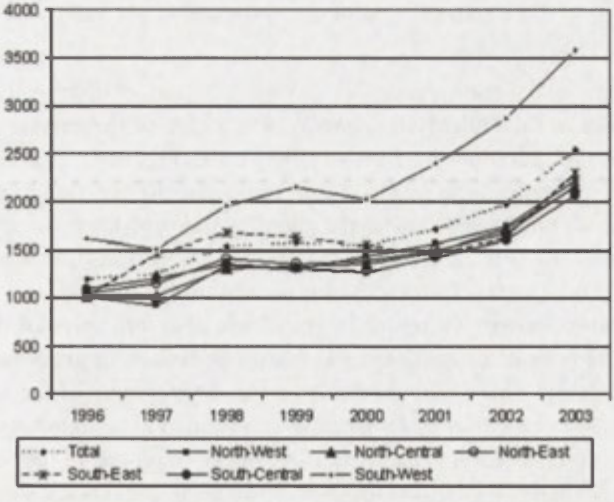

Figure 2. Gross domestic product per capita by planning region in Bulgaria

standing out against the background of the prevailing districts with lower values (Figure 3). The 'Sofia-capital city' district is notable for its highest value—twice as high as the average for the country. The current situation and prospects for future prosperity give grounds to believe that the difference between 'Sofia-capital city' district and the remaining districts will increase in the coming years, unless the economic conditions and rate of economic development in them improve.

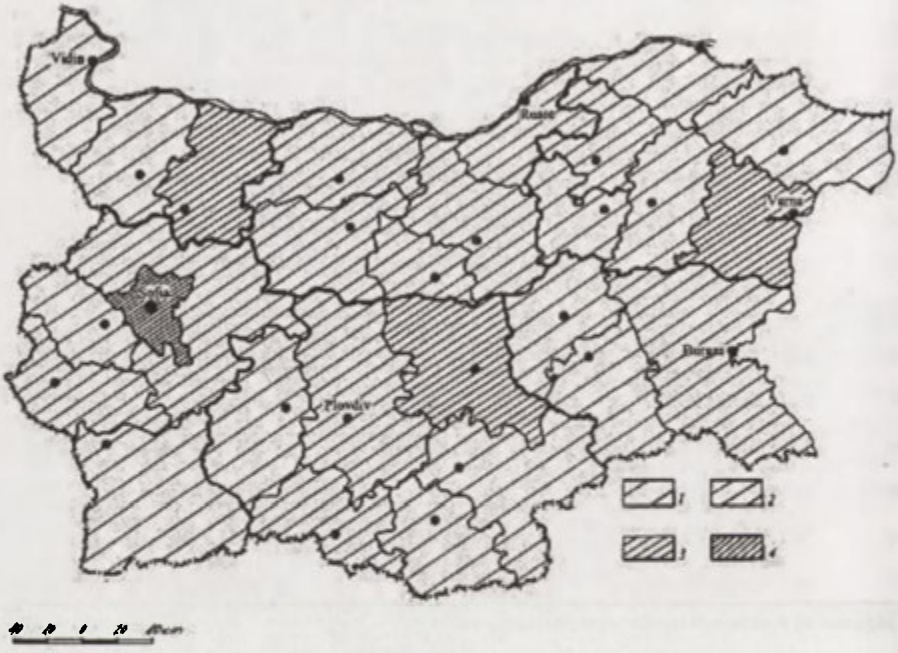

Figure 3. Gross domestic product per capita by districts in Bulgaria
1—2000–3000, 2—3000–4000, 3—4000–5000, 4—over 7000

Due to the transformation processes during the period of transition, significant changes took place in the Bulgarian economy. The share of the private sector in gross value added grew considerably—over 8 hold (1990–2003, Figure 4). This is a consequence of the reforms in ownership, the privatization processes, the creation of new private enterprises and farms and the very low share taken by the private sector at the end of the 1980s. The share of the private sector in the early years of transition was much smaller than that noted in the Central European countries in transition.

The changes in economic structure by sector are also indicative of the transformation trends. In the period of transition the share of services in gross value added and employment was rising. This resulted both from the development of the aforesaid sector and from the drop in industrial and agricultural output. These trends were common to all regions (Figure 5). In absolute figures the numbers employed in the service sector of the South West region saw the biggest increase. In terms of percentage share the least significant was the reduction in employment in the industries of the South West ard North

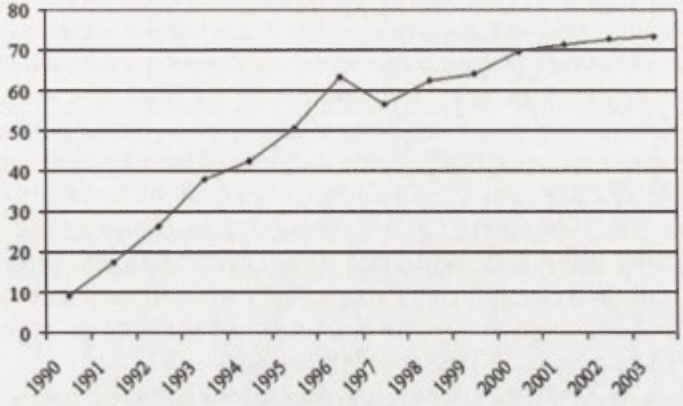

Figure 4. Gross value added in private sector

Central regions. Vice versa, the agriculture of the North West, South Central and South East regions experienced the greatest employment declines in.

Today within the national economy, the greatest share of employed persons is recorded in the services. In industry, this share is smaller and in agriculture, the smallest. There are marked differences at regional level. The largest number employed is observed in the service sector of the South West region, followed by the South Central and North East

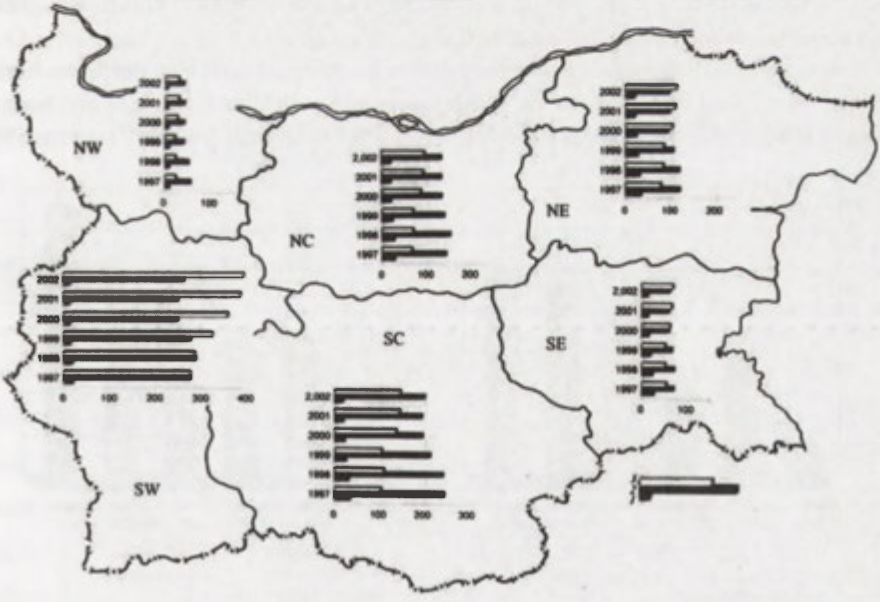

Figure 5. Employment in non-financial enterprises by economic sectors (thousand persons)
1—agriculture, 2—industry, 3—services

regions. The largest cities in the country (Sofia, Plovdiv and Varna) are located in these regions. They attract and give impetus to services of national and regional importance, such as those in business activities, education, health care, public administration, etc. The numbers employed in industry are again largest in the South West and South Central regions, while they are smallest in the North West region. As for the agrarian sector, the highest number of employed is established in the South Central, North Central and North East regions, in which agroecological conditions favour the cultivation of various crops.

The numbers employed in the national and regional economies dropped markedly in the 1990s, as compared with the situation at the end of the 1980s. The decline in employment in the national economy is continuing. In the 1997–2002 period, the reductions in rates were much smaller than those during the first half of the 1990s. At the same time, the number of employed in the private sector essentially grew.

The analysis of the differences by region demonstrates different trends to changes—the numbers employed in non-financial enterprises grew only in the South West and North Central regions whereas in the other 4 regions they decreased. The highest level of employment was registered in the regions with the largest populations (South West and South Central) and the lowest in the North West and South East regions.

In the course of the economic transformations, considerable changes occurred in the structure of enterprises. During 1997–2002 the number of non-financial institutions in all planning regions was increasing (Figure 6). Among them the small enterprises took the greatest share (91.2% of all non-financial enterprises in the country, 2002 data). Over the same period the number of non-financial enterprises increased in all regions. Most significant is the increase in the South West region (34.5%), where it was at more than twice the national average (17.4%). In all other regions, the number of enterprises grew at rates lower than the average for the country.

The regional distribution of employed persons in the non-financial enterprises implies that most numerous these were in the South West and South Central regions and least numerous in the smallest regions of the North West and South East (Figure 7). In the 1997–

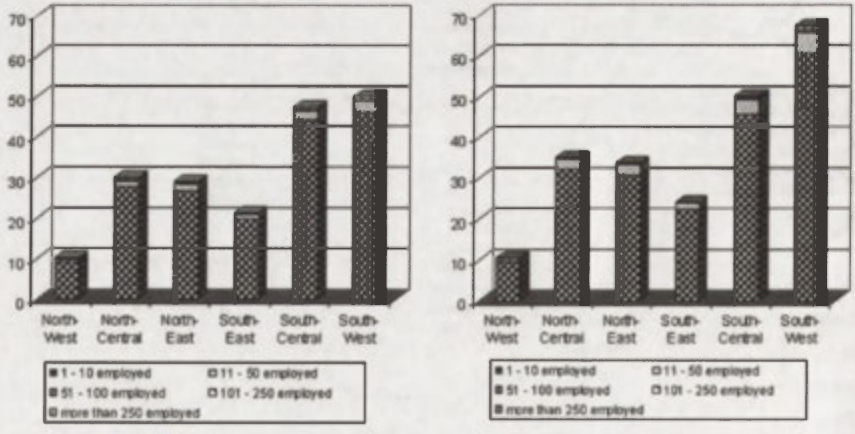

Figure 6. Number of enterprises ('000) in Bulgaria (excl. financial) by size (by planning regions, 1997 and 2002)

Figure 7. Employment ('000) in enterprises (excl. financial) in Bulgaria by size of enterprise (by planning regions, 1997 and 2002)

2002 period the numbers employed in them increased only in the South West (17.3%) and in the North Central regions (4.3%). The comparison confirms the nation-wide trend towards an increase in numbers of employed persons in the small and medium-sized enterprises, and towards a decrease in numbers employed by large enterprises.

Substantial regional differences can be discerned with respect to the number of firms per 1000 inhabitants (Table 4). The comparison suggests that, by numbers of domestic firms, there are two regions in the best position—the South West and the South East. The number in the North West region is much lower than the national average. Greater regional differences can be distinguished with regard to the number of foreign firms per 1000 people. Only the South West region stands out, as compared to the remaining five regions. This fact (by analogy with the other indicators) is due to the 'Sofia-capital city' district, because it is very attractive for foreign investments and for the setting up of foreign firms.

Table 4. GDP per capita and number of firms per 1000 inhabitants (2002)*; national average = 100

Planning regions (NUTS II)	Gross domestic product per capita	Domestic firms per 1000 inhabitants	Foreign firms per 1000 inhabitants	Share of foreign firms from domestic firms
North-West region	91.0	74.9	15.9	20.5
North Central region	86.1	85.9	34.0	41.0
North-East region	87.2	95.5	70.2	71.8
South-East region	84.9	107.3	59.6	56.4
South Central region	83.4	92.9	68.1	71.8
South-West	139.6	121.0	255.5	182.0
Sofia-capital district (NUTS III)	218.7	150.0	353.2	230.8

* Calculations based on data from National Statistical Institute

The analysis of territorial differences in total foreign direct investments (FDI) in the non-financial enterprises, by planning regions, shows an increasing share of the South West region and a relatively equal share for the other five planning regions (Table 5). In 2002, 67.2% of the country's FDI was directed to the South-Western region (in 2000 this share was 65.8%). A comparison of FDI per capita in the planning regions of best to worst positions (South West and North West regions) indicates that the differences are lessening. At the same time, the differences between the best and second best planning regions (South West and North East) are being aggravated.

As far as the districts are concerned, there is a marked narrowing of differences between districts in the best to worst positions—about 8 times within 5 years. In 1997, the size of FDI in the district in the best position was 409 times greater than that in the worst placed district; in 2002 the excess was 52 fold (Table 5). Nevertheless, the district level differences remained significant. During the whole period, the Sofia-capital district was in the best position while Silistra district (1997) and Kyustendil district (2002) fared worst. The correlation between the districts in best to worst position (excluding 'Sofia-capital city') emphasizes the major importance of the latter and its growing share in FDI. By itself the district alone receives 56.3% of the country's FDI in non-financial enter-

Table 5. Foreign direct investment by planning regions

Indicators	1997	2000	2002
I. Share of FDI (total, on comulative basis as of 31.12) by planning regions			
North-West planning region	1.7	1.3	3.8
North Central planning region	12.6	9.5	8
North-East planning region	14.3	12.4	9.5
South-East planning region	3.9	5.7	4.7
South Central planning region	5	5.3	6.8
South-West planning region	62.5	65.8	67.2
II. Differences of FDI per capita between planning regions and districts			
Best to worst position of planning regions	11.5	13.6	9.17
The best planning regions to the second (best)	3.15	3.3	4.34
Best to worst position of districts	409	114.8**	51.7***
Best to worst position of districts without Sofia cap.	311	114.8**	37.2***
The best district to the second (best)	1.32	1.01**	1.39***

* Calculations on the National Statistical Institute's information
** Excluding districts of Vratsa, Montana, Razgrad, Targovishte, Sliven, Yambol
*** Excluding districts of Vidin, Montana, Razgrad, Silistra, Targovishte, Sliven, Yambol

prises (2002 data); of the 2000 share of 49.9%. Still greater territorial differences in the economic development of NUTS 3 regions are expected in the future.

The regional policy implemented in the country, is based on new laws conforming to the EU principles of regional policy and adopted in recent years (1999, 2004). The new Act on Regional Development (2004) has for the first time required the establishment of regional councils as organs carrying out government policy in the planning regions. This law envisages changes (by virtue of special regulations) in the regions for purposeful impact (Table 6), with respect to their type, criteria and indicators, in order to increase their contribution to regional development.

Table 6. Regions for purposeful impact in Bulgaria

In accordance with the Act on Regional Development (1999)	In accordance with the Act on Regional Development (2004)
Regions for growth	Regions for growth
Regions for development	(Not existing in the newAct)
Regions for trans-border cooperation and development	Underdeveloped border region
Declining industrial region	Declining industrial region
Underdeveloped rural region	Underdeveloped rural region
Mountain region (only mentioned in this Law)	Underdeveloped mountain region
	Capital municipality

CONCLUSION

These amendments to the Act on Regional Development (2004), the relevant regional policy and the measures taken by governmental bodies in the name of regional development at the different (national, regional, district and municipal) level—aim to create proper conditions for regions' balanced and sustainable development, and for eliminating intra- and inter-regional economic disparities.

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CHANGES IN COMMUTING IN SLOVAKIA IN THE YEARS 1991–2001

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Key words: commuting, commuting centres, restructuring, transformation of the economy, Slovakia

INTRODUCTION

Socio-economic and political changes in Slovakia after 1989 have also influenced the character of processes, which form the spatial structure of society. One of the most important processes influencing the formation of spatial structure of society is commuting to work, so it is supposed that in the consequence of changes, the character of commuting has also changed.

The aim of this paper is to identify the most important changes in commuting in Slovakia in the years 1991–2001, caused by the transformation process, to investigate the regional aspects of such changes and to evaluate the factors that caused them. The data on commuting were obtained from the March 1991 and May 2001 censuses while 1991 can be considered the initial stage of transformation and the most recent data concerning commuting at the national level are from 2001.

The most important and striking change is the decrease of the economically active population that commuted to work by about 201.4 thousand from almost 998 thous. in 1991 to 796.5 thous. in 2001. The immediate cause of the decrease of the number of out-commuting persons lies in changes of economic activity of the population evoked by transformation in the individual sectors of the national economy. Reduction of high employment in agriculture, transformation, and in many cases decay of big industrial firms, are considered the most important changes. Such changes have also afflicted other industries such as construction above all. The quoted changes led to the progressive increase of unemployment and consequently to the drop of commuting. Further changes include those in position of the individual commuting centres and those in the scope of their hinterlands, decrease of the share of out-commuters from economically active population (out-commuting rate), increase of commuting abroad and almost doubling of its share

in the total out-commuting, changes in age structure of out-commuters and many other changes which attract attention of geographers and the geographic research.

This paper is focused on the evaluation of some changes in out-commuting at the national level of Slovakia, evaluation of the selected changes in out-commuting at the level of the individual districts (total out-commuting and out-commuting in industry, agriculture and construction), and evaluation of changes in commuting to the centres with more than 500 in-commuters.

CHANGES CONCERNING OUT-COMMUTING AT THE NATIONAL LEVEL

The data concerning commuting were obtained from the 1991 and 2001 censuses. According to the methodological guidelines to the census, commuter is a person who works outside his commune of permanent residence. The Statistical Office of the Slovak Republic processed the data about commuting based on the data concerning the place (commune, district) of permanent residence of the commuter and the place (commune, district) of the job while the daily and other commuting were discerned. Daily commuting means an everyday travel to work. Persons temporarily living in the place of work (hostel or rented living place) also quoted daily commuting; that is commuting from their temporary living place to work. Other than daily commuting means irregular commuting (for example guarding service, free-lance position and the like). The commuting data have been processed for all communes and they are classified by out-commuting centres. Names are quoted only in case if more than 10 persons out-commute. It means that in some cases it is not possible to identify the commune of out-commuting.

Certain inaccuracy in comparison of the out-commuting data is caused by the changes in the territorial division of Slovakia in terms of communes. In time of the 1991 and 2001 censuses there were 2,825 and 2,883 communes respectively in Slovakia. In the time between censuses 16 communes disappeared including 15, which joined other 13 communes, and one disappeared by joining a couple of communes. On the other side, 74 new communes were formed by division or separation, which concerned 57 communes. The quoted changes concerned 145 communes, which existed in the 2001 census.

Between the years 1991–2001 *the number of out-commuters* dropped by 201,441 persons from 997,925 to 796,484, (the decrease by 20.2%). Apart from the decreased number of out-commuters, the out-commuting rate also decreased. While as much as 38.1% of all economically active inhabitants commuted outside their communes in 1991, in 2001 they made up for only 29.0%. It means that the share of out-commuters in the total number of economically active inhabitants dropped by 9.1%.

Compared to 1991, the share of economically active inhabitants working in the commune of their permanent residence also dropped by 6.2% to 45.6%. The increase of unemployment caused by transformation of economics is more obvious in the share of out-commuters than in the share of economically active inhabitants working at the place of their residence as testified to by the values of Pearson's correlation coefficient in the set of 72 districts (-0.61 and -0.51).

If out-commuting is expressed by the share of the out-commuters in the total number of employed persons, it dropped by 3.6% from 42.4% employed in 1991 to 38.8% in 2001.

In comparison to 1991, *the share of persons commuting abroad* almost doubled from 3.5% (35,166 out-commuters) to 6.0% (47,542 out-commuters), while in 1991 the out-commuters to the Czech republic amounted to 3.0% (29,957 out-commuters) and out-commuters to other countries constituted only 0.5% (5,209 out-commuters). The 2001 data do not allow determining the target country of commuters. We suppose that commuting to the Czech Republic dominated also in 2001. Compared to 1991, out-commuting to other countries prevailed probably because of higher wages in the countries of the EU, USA and other advanced countries. The higher share of commuters to foreign countries is also the consequence of better travelling possibilities and the improving skills of Slovaks in foreign languages.

In terms of *the share of men and women in the total number of out-commuters*, there were almost no changes at the all-Slovakian level. In both studied years approximately 60% of out-commuters were men and 40% were women. Only a slight increase of share of women by 0.5% to 40.3% is observable.

Observing *the age structure of out-commuters*, it is obvious that the largest change concerns the out-commuters at the age of 15 to 24 years. The share of out-commuters in this category decreased by 9.9% from 24.1% to 14.2%. It is caused by the extension of the obligatory school attendance years from nine to ten, by increase of number of university students and the ageing of Slovakia's population. On the other side, the share of out-commuters at the age of 45 to 59 years increased by 6.4% from 20.9% to 27.3%, as also caused by the larger share of this age category in total population.

As far as *the structure of out-commuters by the individual sectors of the national economy* is concerned, the share of commuters, which decreased most, was the one of agricultural workers (by 8.1% from 13.7% to 5,5%). It was caused by restructuring of the agricultural sector when many agricultural firms closed, over-employment decreased, and also because some associated productions separated from the agricultural firms.

A similar decrease of out-commuting was observed in that to industrial companies where the corresponding share decreased by 7.6% from 38.6% to 30.9%. One of the causes of the decrease of population's economic activity is the fact that in transformation period many, formerly parts of industrial companies covering the catering, recreational services or departments of foreign trade, separated from their companies and often transformed into new businesses where the workers reclassified into the sector of services in contrast to their appurtenance to the industrial branches in 1991 (Figure 1).

The decrease of the number of out-commuters in construction was also important (by 5.0% from 12.9% to 7.9%). In spite of the fact that the number of economically active inhabitants in transport and communications decreased by more than 21 thousand, their share in out-commuting remained at an approximately the same level (it increased by 0.2% to 8.0%). The accessible data make it possible to compare the representation of out-commuting in trade where the increase of out-commuting was observed by 4.0% from 8.5% to 12.5%.

As the remaining data categories in the framework of the structure of out-commuters in terms of branches were different in the 1991 and 2001 censuses, the comparison is impossible. But it is supposed that the share of out-commuters working in services increased. A certain distortion of the results of out-commuting is also caused by the fact

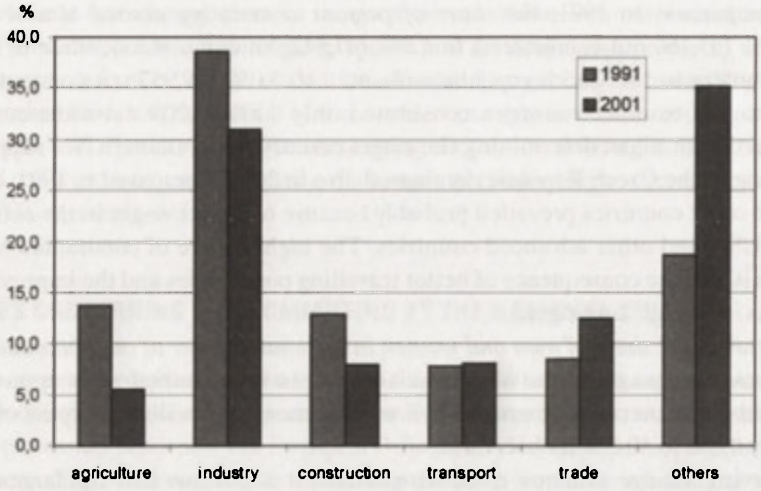

Figure 1. Structure of out-commuters by sectors of national economy in the years 1991 and 2001

that there is as much as 16.4% of commuters under the category of 'other and not specified' in 2001. It is presumed that compared to the quoted results, the actual employment decrease in some sectors is lower and the increase higher.

The above quoted changes in out-commuting by the individual sectors of the national economy can be explained to certain extent by changes in economic activities of population. Compared to 1991 when there were 2,617,935 economically active persons in Slovakia, this number increased by 130,115 to 2,748,050 in 2001.This increase also manifested in the share of economically active inhabitants in the total population which increased by 1.4% to 51.1%.

In spite of the increased number of economically active persons the number of working persons in Slovakia dropped by 310,874 from 2,313,631 in 1991 to 2,002,757 or by 13.4%. The result of decrease of working persons number and the increase of economically active persons was the increased number of unemployed. Whereas in 1991 there were only 107,416 unemployed (4.1% economically active persons), their number increased as much as to 561,214 (20.4% economically active persons) in 2001.

The share of economically active persons on maternity leave dropped over the studied years by 1% to 5.0% in 2001. Expressed in absolute numbers, this decrease represented 20,252 economically active persons (Figure 2).

CHANGES IN OUT-COMMUTING AT THE REGIONAL LEVEL

In the period between censuses, the territorial-administrative division changed and the number of districts increased from 38 to 79, while Bratislava and Kosice were divided into 5 and 4 districts respectively. As for the study of commuting it is not appropriate to divide these cities into smaller units, out-commuting was assessed at the level of 72 districts.

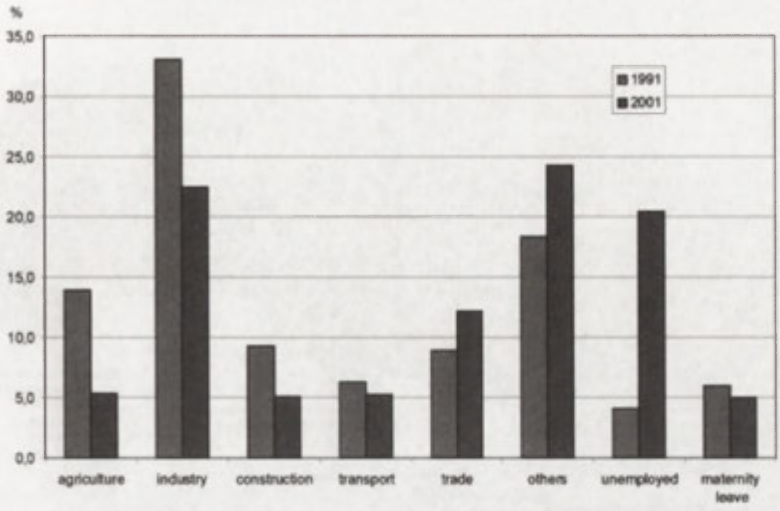

Figure 2. Share of out-commuters in the total of economically active population (out-commuting rate) in the selected sectors of national economy in the years 1991 and 2001

CHANGES IN TOTAL OUT-COMMUTING

As already mentioned, number of out-commuters in 2001 decreased by about 201.4 thous. of almost 998 thous. to 796.5 thous. compared to 1991. The decrease of commuting was observed in all districts with the exception of Bratislava where it increased by 5.2%. Presumably, this change is connected above all with the increase of out-commuting abroad, in case of Bratislava it is to Austria and it is also due to reverse commuting, a new phenomenon in Slovakia, when population of large cities out-commutes to their hinterlands. A comparatively low decrease of out-commuters (below 10%) was found in hinterland of Bratislava (districts of Malacky, Pezinok, Trnava, Piešťany, Myjava) and in two central Slovakian districts (Ziar nad Hronom, Zvolen). Districts of western Slovakia are remarkable for and below-average decrease of out-commuters—districts of Nové Zámky, Nitra, Partizánske, and Bánovce nad Bebravou and in Považie as far as the district of Považská Bystrica. On the contrary, a decrease of at least 30% of commuters was found in districts of Medzilaborce (by 42.1%), Veľký Krtíš, Snina, Sabinov, Rimavská Sobota, Žarnovica, Zlaté Moravce, Stropkov a Kežmarok (by 30.0%) with the common feature of high unemployment and in some of them (Medzilaborce, Veľký Krtíš, Zlaté Moravce) also the decrease of economically active persons.

Likewise, out-commuting rate also decreased from 38.1% in 1991 to 29.0% in 2001. The highest decrease of the out-commuting rate was found in eastern Slovakia where it reached more than 20% in five districts (Sabinov, Košice—vidiek, Sobrance, Kežmarok, Gelnica). On the other side small decrease (below 5%) was observed in districts of Liptovský Mikuláš, Banská Bystrica, Zvolen, Žiar nad Hronom, Trnava, Piešťany, Myjava a Košice, and in Bratislava only a slight rise (by 0.1%) of out-commuting was observed (Figure 3).

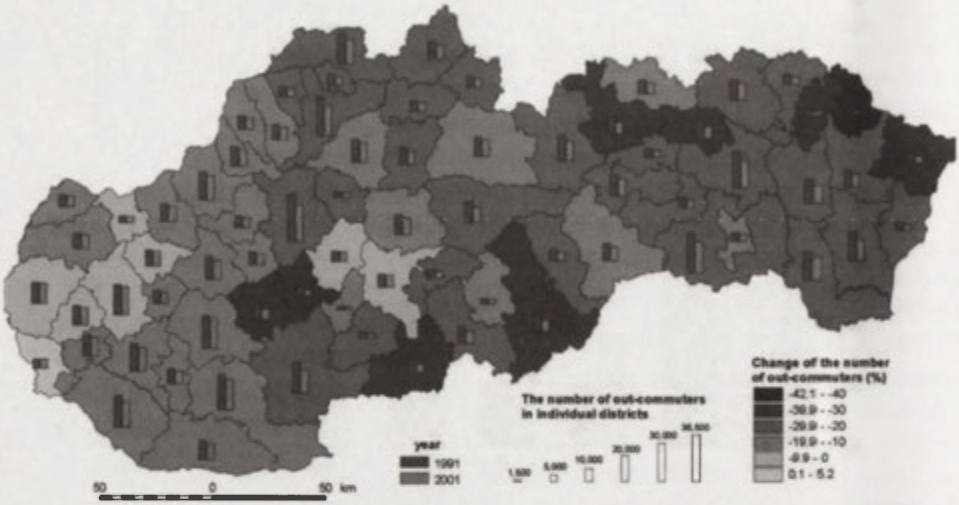

Figure 3. Changes in total out-commuting at the regional level in the years 1991–2001

CHANGES IN OUT-COMMUTING IN AGRICULTURE

Economically active persons in agriculture include the persons working in agriculture and forest and water management. In 1991 13.9% economically active persons, i. e. in total 364.8 thous. employees worked in agriculture. In the course of the next ten years the share of economically active persons working in agriculture decreased by 8.6% to 5.4%. The number of employees in agriculture dropped by almost 217 thous. to 147.9 thous. of economically active persons (by 59.9%).

In terms of individual districts, the largest decrease of economically active persons working in agriculture was found in the cities of Bratislava and Košice (more than 80%). This decrease reaches more than 60% in three continuous areas: southwestern part of Slovakia in hinterland of Bratislava, central and eastern parts of the administrative region of Prešov with the exception of the district Snina. This decrease reached more than 40% almost in all districts, the district Rožňava (by 39.7%) including. Only the districts of Brezno (by 23.7%) and Gelnica constitute exceptions, while a very small increase of number of economically active persons working in agriculture was found in district of Gelnica. It is caused by the fact that these are the districts with the largest share of people employed in water and forest management (more than 65%) and with the highest increase of employees working in this sector compared to 1991.

The decrease of number of economically active persons employed in agricultural sector has also manifested in out-commuting in agriculture. There is a close relationship between the percentage of decrease of the economic activity of people in agriculture and the percentage of decrease in out-commuting in agriculture, as testified to by the correlation coefficient (0.80) between these indicators in the set of 72 districts in Slovakia. The number of out-commuters to work in agriculture distinctly decreased from 136.5 thous. to 44.1 thous. in 1991–2001. The decrease of this type of out-commuting at the all-Slovakian

level represented as much as 67.7%, and it ranged between 22.2% in the district of Brezno and 86.7% in the district of Svidník. The largest area with above-average decrease of this out-commuting is the central and eastern part of the administrative region of Prešov, north-western part of Slovakia excluding the district of Čadca, districts on the border with Hungary from Levice to Revúca, and the districts of the south-western part of Slovakia from Bratislava and Pezinok to the district of Šaľa.

Compared to 1991, the out-commuting rate in agriculture also decreased. In 1991, 37.4% persons economically active in this branch out-commuted in agriculture compared to 2001 when it was only 29.9%. The highest decrease of the out-commuting rate was found in eastern Slovakia, particularly in the central and eastern parts of the administrative region of Prešov, in hinterland of Žilina, and in the south of central Slovakia.

The decrease of the out-commuters to work in agriculture is well visible in the structure of commuters classified by sectors, i.e. in the share of out-commuters working in agriculture in all commuters. While in 1991 out-commuters working in agriculture represented 13.7% of all out-commuters, it was only 5.5% in 2001. Decrease of this category of out-commuters by at least 10% was found in the districts of the north-eastern Slovakia and in the south of central Slovakia, that is to say in districts with the highest share of out-commuters working in agriculture in 1991 (correlation coefficient value 0.90). The largest decrease was in districts Svidník and Stropkov (more than 20%).

CHANGES IN OUT-COMMUTING IN INDUSTRY

The most important sector of Slovakia's national economy is industry and it was also afflicted by changes after 1989. From individual branches of industry the transformations changes influenced most engineering production (especially defence industry; see Kiss 1999) and also electrical engineering, metallurgy and chemical industry. Restructuring of the industrial sector caused decrease of its share on GDP from 58.3% to 24.4% in the period 1989–2001. Decrease of industry can be demonstrated also through changes of economical activity of population. In 1991, 33.1% of economically active persons, i.e. in total 867 thous. employees worked in industry. In the consequence of transformation, the share of economically active persons working in industry decreased by 10.6% to 22.6% in 2001. The number of employees in industry decreased by almost 250 thous. to 618 thous. (by 28.8%).

This decrease reached the values oscillating between 5.1% (Krupina) and 47.2% (Gelnica) in the individual districts. The largest number of districts with the decrease of economically active persons working in industry by more than 30% is in central Slovakia and the eastern part of western Slovakia. This area stretches from Orava and Kysuce as far as the districts of Nové Zámky and Lučenec. The district of Krupina where industry is not so important compared to other branches of economy, is an exception. More districts with above-average decrease of economic activity of population are in Spiš in the north-eastern spur of Slovakia and districts Piešťany, Košice, Senec and Bratislava while these values, above all in case of Bratislava may be influenced by the fact that many inhabitants did not quote the branch of economic activity at the 2001 census.

There is not such a close relationship between the out-commuting in industry as it is in agriculture. As a matter of fact, in industry there are many more economically active per-

sons commuting to more distant centres. It means that in spite of the decreased number of economically active persons in industry caused by transformation of industrial firms in some districts, their population can commute to important industrial centres.

In the years 1991–2001, the number of out-commuters working in industry decreased in terms of the whole country by 36.0% from almost 385 thous. to 246 thous. The decrease of out-commuting in industry expressed in percentage reached above-average values above all in the northern part of central Slovakia (Orava, Kysuce, districts Žilina and Ružomberok), in the area of the southern border between central and western Slovakia and in the northern part of eastern Slovakia. On the other side, the minimum decrease of out-commuting to work in industry was found in districts of Poltár (14.8%) and Malacky (12.8%). An increase of the out-commuters working in industry by as much as 30.8% was observed in Bratislava. However, expressed in absolute values, the increase made up only for 243 persons of 1,045 out-commuters.

The decrease of out-commuting persons working in industry by 4.5% from 44.4% (1991) to 39.9% in 2001 was also recorded. In terms of individual districts, the out-commuting in industry decreased in Námestovo (26.3%), Krupina, Tvrdošín, Sabinov, Sobrance, Svidník, Medzilaborce, Čadca and Stará Ľubovňa (15.7%), however, there are districts with a slight increase of out-commuting to work in industry while an increase of more than 5% was found in districts of Malacky, Žiar nad Hronom and Piešťany.

Changes in out-commuting in industry are well observable in values of the share of this category of commuters in the overall number of commuters. As far as branches of economy are concerned, the representatives of out-commuters in industry dropped by 7.6% to 30.9%. However, the values of this indicator were relatively differentiated at the level of districts. The largest decrease was found in those districts where out-commuting to work in industry dominated (more than 40%). This group includes the districts of Tvrdošín, Námestovo, Čadca, Banská Štiavnica, Brezno and Gelnica with the decrease of more than 15% of all commuters. The districts with low values of this decrease are situated in the southern parts of Slovakia above all in administrative region of Košice. They are all characterised by minor importance of out-commuting to work in industrial firms (Figure 4).

CHANGES IN OUT-COMMUTING IN CONSTRUCTION

Transformation changes afflicted also construction in Slovakia. In 1991 worked in construction, 242.7 thous. economically active persons (9.3%). In the following ten years this number decreased to 139 thous., (5.1% of economically active persons in 2001). Hence, this decrease was 103.7 thous., and the number of persons employed in construction dropped by 42.7%. Actually this decrease is much lower as construction is the branch of economy with the highest incidence of illegal work (Bednárik et al. 2003).

Observation of the economic activity of population in construction by districts reveals that in the years 1991–2001 the largest decrease (by more than 60%) was recorded in Bratislava, Pezinok, Košice and Banská Bystrica as related to the reduced construction of flats on the one side and the high incidence of illegal work in large cities. A more than the 40% decrease of economic activity in construction was found in almost all districts of western Slovakia and in the south of central and eastern Slovakia. In spite of the decrease

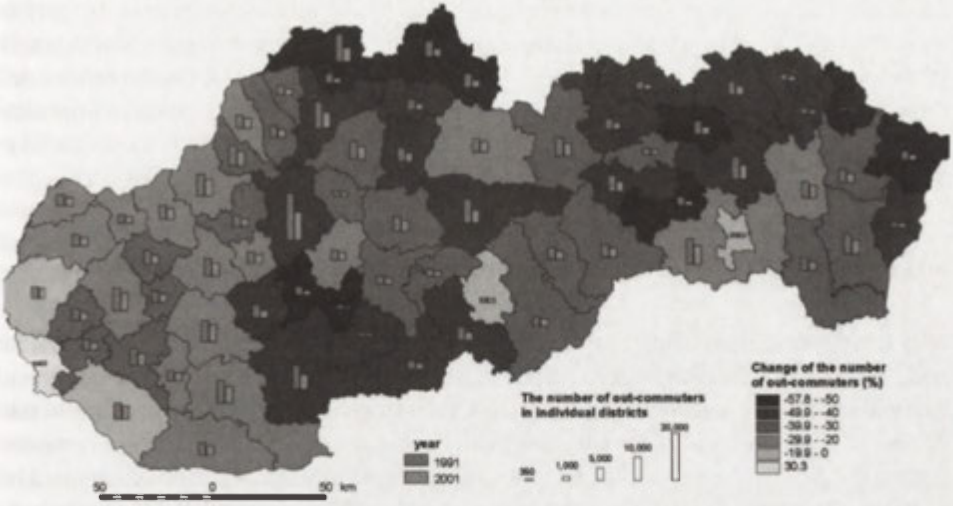

Figure 4. Changes in out-commuting in industry at the regional level in the years 1991–2001

typical for the whole country, there are districts where the position of construction was strengthened. These are the districts situated in the north with the increase of economically active persons in construction such as Kysucké Nové Mesto (increase by 13.1%), Námestovo (27.8%), Svidník (34.6%), Stará Ľubovňa (48.5%) and Tvrdošín (62.8%). Commuters from these districts commute to big centres (Bratislava) and also abroad (especially the Czech Republic).

Changes in activity in construction have distinctly manifested in the out-commuting in this sector. The very close relationship between them is pointed to by the correlation coefficient (0.94) between the percentages of the change of economic activity and out-commuting in construction on the set of 72 districts.

Between the censuses, the drop of out-commuters in construction by 51.1% from 128.4 thous. to 62.7 thous. in 2001 was determined. The largest decrease of out-commuting in construction (by more than 60%) was recorded above all in districts of the south-western Slovakia and in the south of central and eastern Slovakia, particularly in districts with the highest shrinkage of economically active persons in construction. On the other side, increase of out commuters in construction was found in five districts, in Námestovo (6.9%), Stropkov (9.8%), Svidník (10.7%), Tvrdošín (33.3%), and Stará Ľubovňa (39.4%). This increase was caused by the increase of out-commuters as the result of decrease of out-commuters in other sectors (agriculture and industry).

The decrease of the out-commuting rate in construction was also found in this ten-year period. While in 1991 as much as 52.9% of economically active persons in construction out-commuted, in 2001 it was only 45.1%. In spite of it, construction is still the sector with the highest out-commuting rate.

Position of out-commuting in construction in the structure of out-commuting by sectors of economy also changed during the period in question. In 1991, the share of out-

commuters to work in construction represented 12.9% of all out-commuters. In 2001 it was only 7.9%. The above-average decrease was found in districts of western Slovakia and in the western, southern and south-eastern parts of eastern Slovakia. On the other side, importance of out-commuting in construction increased in districts of Banská Štiavnica (0.3%), Cadca (0.6%), Kysucke Nove Mesto (1.7%), Bardejov (3.1%), Tvrdosín (3.9%), Stropkov (4.0%), Svidník (4.9%), Námestovo (7.7%), and Stará Ľubovňa (9.4%).

CHANGES IN COMMUTING TO CENTRES WITH AT LEAST 500 COMMUTERS

In 1991, 967,967 economically active persons including 962,759 persons living in Slovakia and 5,208 persons from the Czech Republic (they represented 0.54% of all commuters), commuted to work. As commuters from the Czech Republic can be identified only at the district level, it is not possible to compute these data in respect of new districts or compare them according to communes. In 2001, 748,942 economically active persons commuted in Slovakia. Compared to 1991, the number of commuters decreased by 219,025. If commuters from the Czech Republic are no included, this decrease is by 213,8 thous. in 1991.

During the 1991 enquiry, the commuters also quoted the simultaneous commuting to several communes. The simultaneous commuting to several communes within a district was quoted by 6,969 persons and the simultaneous commuting to other districts was quoted by 3,172, persons, i.e. in total 10,141 commuters, or 1% of commuters, to which the commune of commuting is not definitely assignable. This fact partially distorts the comparison of data on commuting in the years 1991 and 2001, as while computing the commuting data for the new districts, these commuters were not taken into account and only the number of commuters per one job was considered, i. e. in total 957,826.

Transition also led to transformation of various industrial firms, which were once the most frequent destination of commuters. In the consequence, the total employment decreased and some firms were reduced or disappeared which was logically accompanied by changes in commuting as observable in changes of mutual position of the individual commuting centres. As jobs are much more spatially concentrated than workplaces, the centres with at least 500 commuters will be given attention.

However, many important commuting centres were affected by territorial changes in the period between the censuses—some communes were separated. In order to compare the commuting data for the individual centres, the 2001 data for centres with more than 500 commuters were adjusted to the territorial situation in 1991.

While in 1991 there were as much as 197 centres with at least 500 commuters, their number decreased to 173 in 2001. In 35 centres the number of commuters dropped below 500 and on the contrary, the number of commuters exceeded the limit of 500 in 11 centres.

Compared to 1991, the number of *centres with at least 10 thous. commuters* dropped from 14 to eight—now all seats of regional administration.

The largest commuting centre in Slovakia is Bratislava, while its position in commuting has strengthened. While in 1991 there were 74,895 commuters, in 2001 it was as much as 89,424 economically active commuters to Bratislava, what represents 11.9% of all commuters in Slovakia. Compared to 1991, this was an important increase of commuters by

about 14.5 thousand inhabitants (19.4%), above all in contrast with the national decrease of commuters. This increase was caused by the fact that Bratislava became the capital of the new state in 1993; its economic power capable to generate more work opportunities increased and attracted more commuters. On the one hand the number of commuters to work in agriculture, construction and partially also industry decreased and on the other, new jobs emerged above all due to the development of commerce and services of financial sector, information technology, etc. Bratislava became an attractive centre of commuters for inhabitants of the whole country, above all the young people below 34 years (Michniak 2003; 2004).

Position of *Kosice, the second largest commuting centre in Slovakia* with 30,486 commuters of economically active inhabitants did not change either in 2001. But compared to 1991, the number of commuters decreased by 4,563 (13.0%), as caused by decrease of commuters in construction (decrease by 4.1 thous. commuters) and the decreased number of commuters in industry (decrease by 2.9 thous. commuters above all in metallurgical and engineering industries).

An important decrease of number of commuters was also observed in the *third largest commuting centre—Zilina*, where the number of commuters decreased by 3,979 (14.8%) to 22,938 commuters. According to the individual branches of economy, the decrease of commuting manifested above all in industry (decrease by 4.1 thous. commuters), while the chemical, engineering and paper and pulp industries were the most affected ones.

Compared to 1991, the *largest decrease in number of commuters was recorded in Presov*—as much as by 7,498 commuters (decrease by 31.6%) to 16,241 commuters. The cause of this decrease is first of all the decrease of number of employees in industrial firms (engineering, electrical and clothing industries). While in 1990 total of 17,771 employees worked in industrial branches, in 1999 it was 12,040 employees which means that employment in industry decreased by almost a third (by 5,731 jobs) (Popjaková 2001). This is how Prešov ranks in the order of commuting centres at the fifth position and was replaced by Nitra, with number of commuters 17,360 (a slight increase by 408 commuters). As the communes Ivanka pri Nitre a Lužianky separated from Nitra in time between censuses, they were considered as parts of Nitra in evaluation of the 2001 data. The two communes were centres of commuting with more than 500 commuters in 2001.

Commuting centres Trnava and Trenčín swapped their positions. While the number of commuters decreased only by 221 to 14,402 commuters in Trenčín, in Trnava this decrease was marked and the number of commuters decreassed by 1,349 to 13,370. Between censuses, two communes separated from Trnava: Biely Kostol and Hrnčiarovce nad Parnou and were considered parts of Trnava. Centres Zvolen and Banská Bystrica also swapped their positions. While the number of commuters to Banská Bystrica stayed at the same level (decrease only by 175 to 11,916 commuters), number of commuters to Zvolen decreased by as much as 3,598 to 9,090.

Apart from present regional centres and Zvolen, more than 10 thous. persons commuted to towns Nové Zámky, Martin, Michalovce, Dubnica nad Váhom, Humenné in 1991. The largest decrease was observed in Dubnica nad Váhom, where number of commuters decreased by a half (by 5,441 to 5,309 commuters). The number of commuters in Nové Zámky decreased by 4,385 to 7,460, which represents the decrease by 37.0%,

in Humenne by 3,434 (34.1%) to 6,640 commuters, in Michalovce by 2,851 (24.8%) to 8,627 commuters and in Martin by 2,633 (22.7%) to 8,942 commuters. These industrial centres boast a comparatively diversified structure of industry, while Dubnica nad Vahom and Martin were afflicted by transformation of engineering industry (especially defence industry), Nove Zamky was struck by transformation of electrical engineering and food-processing industries, Zvolen by transformation of engineering and wood-processing industry, Humenne by transformation of chemical industry and Michalovce by transformation of engineering and food-processing industry.

Decrease by more than 3 thous. commuters was observed in fourteen towns. Apart from above mentioned towns, it was Presov, Dubnica nad Vahom, Kosice, Nove Zamky, Zilina, Zvolen, Humenne and Novaky (decrease by 4,358 to 5,555 commuters), Nizna (TS) (decrease by 3,701 to 1,254 commuters), Levice (decrease by 3,574 to 5,600 commuters), Povazska Bystrica (decrease by 3,513 to 5,429 commuters), Galanta (decrease by 3,420 to 4,480 commuters), Svit (decrease by 3,374 to 4,004 commuters) a Bardejov (decrease by 3,242 to 5,350 commuters). Total decrease of number of commuters in these 14 towns was by 58 thous. commuters. In the following twelve centres the number of commuters decreased by more than 2,000 (Vranov nad Topl'ou, Michalovce, Martin, Partizanske, Ruzomberok, Topol'cany, Vrutky, Strazske, Zlate Moravce, Trebisov, Vysoke Tatry and Namestovo) and by more than 1,000 in another 14 centres.

An interesting indicator expressing the decrease of commuting to the individual centres is the *decrease of the number of commuters to the given centre expressed in percentage*. As much as in 33 centres to which more than 500 commuters commuted in 1991, the number of commuters decreased by more than a half. The largest of these centres is Dubnica nad Vahom (decrease by 50.6%), which was afflicted by transformation of engineering industry. It is followed by important centres of commuting in 1991 such as Nizna (decrease by 74.7% to 1,254 commuters) and Stropkov (decrease by 54.8% to 1,467 commuters), where the firms of electrical engineering collapsed, and by the town Strazske (decrease by 50.6% to 2 131 commuters), struck by transformation of chemical industry.

In centres Surany (decrease by 57.9%), Lipany (56.5%), Rajec (52.4%) the number of commuters decreased from more than 2,000 to more than 1,000. In centres Cigel' (decrease by 65.4%), Vel'ky Saris (61.2%), Oravsky Podzamok (57.9%), Hnusťa (57.4%), Turzovka (55.4%), Prakovce (51.7%), Modry Kamen (50.8%) number of commuters decreased from more than 1,000 to more than 500 commuters.

In another 18 centres, to which in 1990 more than 500 commuters commuted, the *number of commuters decreased to less than 500 commuters*. In 1991 more than 1,000 commuters commuted to seven of them: Pravenec (decrease by 84.6%), Rudnany (77.5%), Sebedrazie (77.2%), Valaska (73.0%), Hodrusa—Hamre (65.5%), Gabcíkovo (59.0%) and more than 500 commuters to twelve of them: Slovinky (85.0%), Tomasovce in the district of Lucenec (80.6%), Oravska Lesna (75.9%), Liptovska Osada (69.9%), Podvysoka (69.1%), Pohorela (63.8%), Nitrianske Rudno (63.7%), Hronec (587%), Turany (56.4%), Spisska Stara Ves (56.4%), Zavadka nad Hronom (53.5%), Slavosovce (51.5%).

The more than a 50% decrease of number of commuters in the study period is the result of transformation changes which led to the decrease of employees in some firms or to the collapse of other into smaller firms or to their disappearance. One dominant firm,

transformation of which manifested in commuting existed in the majority of these centres. Above all in some smaller centres (Tomášovce, Nitrianske Rudno) transformation of agriculture manifested in the number of commuters, while the main cause of commuting decrease was observed in v Liptovská Osada. The main cause of commuting decrease to centre Gabcíkovo was the conclusion of the construction of the dam.

The commuting decrease in other centres is attributable to transformation of firms in different industrial branches. In centres Cigeľ, Sebedražie, Kos, Modrý Kamen, Rudnany and Hodrusa–Hamre the dumping of mining and quarrying of energy producing and others materials was the cause of decreased commuting. That in centres Dubnica nad Váhom, Pohorelá, Závadka nad Hronom and Spisská Stará Ves was caused by transformation of the manufacture of machinery and equipment, centres Hronec, Oravský Podzámok, Slovinky and Báhon were subjects to transformation of manufacture of basic metals and fabricated metal products, in centres Nižná, Stropkov a Oravská Lesná it was transformation of manufacture of electrical equipment, in Slavošovce it was transformation of the firm dedicated to manufacture of paper, in centres Turany, Pravenec it was transformation of wood products, in Podvysoká it was transformation of the firm dedicated to manufacture of leather and leather products, in Lipany and Spisská Stará Ves it was manufacture of textiles and textile products, in Veľký Šaris it was transformation of manufacture of food products, beverages and tobacco products) (Figure 5).

In spite of the general decrease of number of commuters to the majority of observed centres in Slovakia, there are *centres with increased number of commuters* in comparison to 1990. Apart from Bratislava, which was mentioned above, commuting in 21 studied centres increased by more than 250 commuters. This group covers the centres like Nitra, Prievidza (foreign investments into electrical engineering industry—Yazaki Debnár Slovakia, s.r.o.), Jaslovské Bohunice (nuclear power station), where the number of commut-

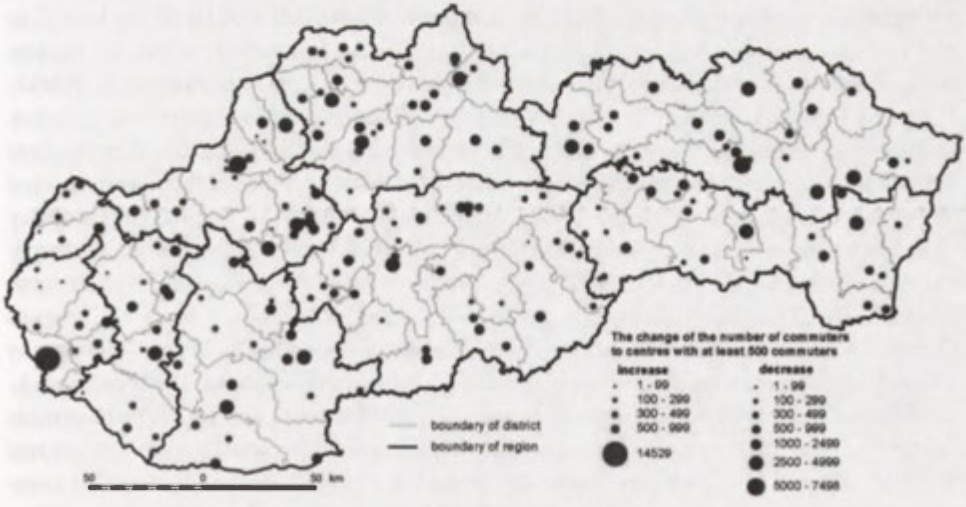

Figure 5. Changes in commuting to centres with at least 500 commuters

ers increased only by 2.4–7.3%. These centres maintained their economic basis and the firms existing there are destinations of commuters.

The group of larger centres of commuting where the number of commuters increased includes Vráble (by 342 to 2,570 commuters), Ilava (by 629 to 2,656 commuters), Senec (by 697 to 2,597 commuters), Pezinok (by 744 to 3,528 commuters), and Skalica (by 812 to 3,419 commuters). Increase of commuting in Vráble by 15,4% is mainly due to opening industrial park IGP Vráble and investments to firms Semecs s.r.o. and Hefra s.r.o. One of important investors in Skalica is INA Skalica, s.r.o., producer of bearings. Increased number of commuters in towns Senec a Pezinok is due to their location near Bratislava, which led to creation of new work opportunities.

Vicinity of Bratislava also influenced commuting to smaller centres in its immediate hinterland, i.e. Stupava (increase by 343 to 1,059 commuters) and Ivanka pri Dunaji (increase by 396 to 1,070 commuters). Among the centres where the number of commuters increased above 1,000 are also two neighbouring communes of Trencianska Teplá (increase by 288 to 1,279 commuters) and Nová Dubnica (increase by 498 to 1,370 commuters) with important investment in electrical engineering industry (the firm Leoni Slovakia, s.r.o. in Trencianska Teplá producing car cables and the firm Q Nova, s.r.o. in Nová Dubnica) and the town of Sliač (increase by 515 to 1,166 commuters). The town of Poltár also drew close to the limit of 1,000 commuters (increase by 269 to commuters 969 commuters).

New centres also appear *in the group of commuting centres with more than 500 commuters*—these are communes with less then 500 commuters in 1991. They include the centres Veľké Leváre and Ľubotice, where more than 400 employees commuted in 1991 and their number slightly increased. In Veľké Leváre (increase by 170 to 657 commuters) there is an important production of precast construction modules (Prefabrikát, a.s.), a plant producing cardboard packing material (Surpack, a.s.) and one producing machinery products (Bleckman, s.r.o.). There is also an important seasonal employer involved with growing and sales of asparagus (Asparagus, s.r.o.). In Ľubotice (increase by 462 to 864 commuters) there are various industrial firms in the immediate vicinity of Prešov. New centres with more than 500 commuters include also Kolárovo, Gemerská Hôrka, Horná Streda, Košťany nad Turcom a Vavrecka with important investments in industry. In Gemerská Hôrka (increase by 288 to 530 commuters) new jobs originated in the firm dedicated to hygiene products (SCA Hygiene Products, s.r.o.), more of them were created in Horná Streda (increase by 373 to 532 commuters) in electrical engineering industry (Vacuumschmelze s.r.o.), in Vavrecka (increase by 479 to 502 commuters) in electrical engineering industry (Punch Campus Námestovo s.r.o.), in Košťany nad Turcom (increase by 777 to 881 commuters) car industry—production of car seats and casings (Trim Leader, a.s.) in machinery (Hansa—Flex Hydraulik), and in Kolárovo (increase by 855 to 1,222 commuters) in electrical engineering industry (Kromberg a Shubert, s.r.o.).

Four of new commuting centres with more than 500 commuters in 2001 are centres created by separation from some towns—they are Hencovce (separated from Vranov nad Topľou) with 2,234 commuters, Tovarníky (separated from Topoľčiany) with 781 commuters and Lužianky (separated from Nitra) with 777 commuters, and Ivanka pri Nitre (separated from Nitra) with 616 commuters. These communes were considered parts of

towns from which they were actually separated for the purpose of comparison of commuting data for the years 1991 and 2001. The adjusted data on commuting to these towns were computed as the sum of commuting to the centre and all separated communes, and then the mutual commuting between the centre and separated communes were subtracted.

Apart from the already quoted centres, the number of commuters also significantly increased in some small commuting centres. In 2001, compared to 1991 number of commuters increased by more than 200 in centres Zbrojníky (meat processing plant—PM Zbrojníky, s.r.o., increase by 226 to 303 commuters), Lúka (production of soft drinks—Coca-Cola Beverages Slovakia s.r.o., increase by 228 to 272 commuters), Kuchyňa (increase by 310 to 462 commuters) and Závažná Poruba (production of furniture—Swedwood Slovakia s r.o., increase by 332 to 371 commuters).

CONCLUSION

The most important change in commuting which took place in the years 1991–2001 was the decrease of the absolute number of commuters by more than 200 thous. This decrease was recorded in whole Slovakia (the highest decrease was identified in eastern Slovakia) with the exception of Bratislava.

Considering the individual branches of economy, the decrease of number of commuters was most striking in agriculture, industry and construction, i.e. those most affected by transition. The decrease of commuters to work in agriculture was observed in whole Slovakia and the least afflicted were the districts with the highest share of workers in forest management. Likewise, the decrease of number of commuters in industry manifested in the whole territory of Slovakia with the exception of Bratislava. In construction, the decrease of out-commuters was recorded in the major part of the Slovak territory (above all in its southern part), but there also exist districts with an increasing importance of out-commuting in construction (out-commuting to large cities and abroad in some districts of northern Slovakia).

Observing commuting to centres with more than 500 commuters, one of the most important changes resulted in the strengthened position of Bratislava as the largest commuting centre in Slovakia. Approximately the same number of commuters was maintained in some largest centres such as Nitra, Trenčín and Banská Bystrica in the study period. On the contrary, in1991 more than 30 % decrease of commuters (more than 7 thous. commuters) was identified in centres Prešov, Zvolen, Nové Zámky, Dubnica nad Váhom, Humenné, Nováky, Levice, Považská Bystrica, Bardejov, Vranov nad Topľou, Galanta and Svit.

Key factor influencing the position of commuting centres was their ability to face up to transformation of economy. Because of its successful realisation the foreign investments has played a very important role. It is possible to suppose that the position of commuting centres with foreign direct investments and centres with industrial parks will be strengthened. Examples of centres demonstrating the above said, are centres with growing number of commuters as Bratislava, important centres are Vráble, Ilava, and Skalica, and the smaller of them include Trenčianska Teplá and Nová Dubnica. Increase

of number of commuters to centres like Senec, Pezinok, Stupava, and Ivanka pri Dunaji was caused by their position in the immediate vicinity of Bratislava. Among examples of formation of new commuting centres with at least 500 commuters as fostered by arrival of foreign investors are Gemerská Hôrka, Horná Streda, Kosťany nad Turcom, Vavrecka and smaller of them are for instance Lúka, and Závažná Poruba.

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DEMOGRAPHIC AND ECONOMIC SITUATION IN NEW DECLARED TOWNS IN BULGARIA (2002–2003)

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INTRODUCTION

At first sight terms like 'town' and 'urban population' seem comprehensibly clear, but in fact the question of their definition from the scientific and practical points of view is not easy at all. Many scientists like demographers, urbanists, engineers, architects and others make their own contribution to defining it, by inputting some meanings and characteristics. Very often definitions are used in opposition to 'village', with the urban lifestyle being set against the rural or country lifestyle. Most definitions accentuate the largeness of towns, and this is the way they reach lifestyle as a criterion. The criterion of lifestyle is broadly used to characterise urbanization and includes many points of view. However, as the urban lifestyle could distribute itself outside cities and towns, other distinctive characteristics are needed.

PROCEDURE OF TOWN'S ESTABLISHING IN BULGARIA

In this sense, criteria now present the level of development of the economic functions. For example—industrial functions like employees in industry, level of industrial production, etc. The social indicators are more varied—in the field of education, healthcare, culture etc. The National Statistical institute defines a town as follows: 'A populated point which is related to the category of towns in line with the respective state legislation. The rule is to have a population considerable enough (in comparison with the villages) and that population is principally occupied with non-agricultural activities' (*People-population* 1994).

The most important social definition that is imposed is the provision in law. The power of the law determines development of social relations. The determination in law is indispensable for all people and institutions. The exact interpretation of the wording in the law gives the correct application. The Act on administrative territorial establishment of the Republic of Bulgaria says:

'For declaring a village to be a town it is necessary to have over 3500 inhabitants and built social and technical infrastructure' (Art. 33, item 1).

'The procedure for enacting the change is:

1. by proposal of the mayor of the settlement, the municipality council takes a decision act in two months' time and sends it to regional governor;
2. the regional governor sends the municipality council's decision act in two months' time along with the his/her own position to the Council of Ministers;
3. the Council of Ministers' decree for the change come into force a the day of publication in the 'State gazette' (Art. 33, item 2).

Two types of criteria are important for the Bulgarian legislation to establish new towns. They must exist cumulatively and simultaneously at the moment the decision is taken and the decree issued. However, Bulgarian legislation does not give the exact definition of a town or city, focusing only on the requirements for declaring a village to be town. Automatically, the rural population of the settlement transforms into an urban population. Besides, the law does not place exact and clear instructions at applicants' disposal as to what is meant by social and technical infrastructure. As a result, these terms are elastic and permit more free interpretation, so the real motives sometimes remain subjective and hidden from the normative acts.

In any event, in the contemporary history of Bulgaria (beginning from the second half of the 20th century), the Act on administrative territorial establishment of the Republic of Bulgaria is the first law to give some definition. Obtainment of urban status 1995 prior to occurred on the basis of different types of motive: economic, administrative, historical, personal, etc. The developing of industry, transport and tourist services within settlements' borders create conditions for an extension of functions, particularly those connected with public services. Industry was a factor forming many towns in the 1950's to 1960's, transport activities—towns situated at crossroads, and tourism—a few settlements on the Black Sea coast. The administrative reasons are related to the economic ones and then are leading when the respective settlement dominates over others as an administrative centre. Some villages are proclaimed as urban points because of their historical heritage. During all this period the lack of strong regulation for acquiring urban status is often combined with subjective factors like declaring villages to be towns because of the anniversary of the settlement or of its native people.

The present law divides settlements into only 2 types—'grad' (town/city) and 'selo' (village). Another attempt at the regulation of urban-rural relations, much more successful, is the procedure for change of status from rural to urban. The procedure is noted above.

Careful observation should leave the impression that declaring a town gives a settlement a higher level status. Thus the population of the settlement is in some way elevated. Even though not stated in the law specifically that the town is a higher type settlement,

such an idea does arise from the text. But, the other way about, there is no procedure for declaring the existence of a former town to be a village by reason of a cancellation of the requirements for town.

NEW DECLARED TOWNS

In 1997, the Council of Ministers extended town status to Hadjidimovo in the region of Blagoevgrad, situated in the Southwest part of Bulgaria in the valley of the Mesta river. Two years later the population decreased below 3500 inhabitants, but the settlement remained a town, seemingly forever. Recently (data from the end of 2002) in Bulgaria 59 towns have had below 3500 inhabitants, and the built social and technical infrastructure in a big part of them is a further question at issue. Although the applied wording in the law 'to have over 3500 inhabitants' seem exactly and precisely described, a different interpretation takes place here also. The present research uses initial data from the censuses, with counted present population during the census period and statistics from the National Statistical Institute. For the decision to declare a town takes into consideration the registered people Bulgarian citizenship with the present address in the corresponding settlement. The registration is in accordance with the Act on civil registration (Table 1).

Table 1. Size of population by permanent and present address (December 2003)

Town	Population with permanent address	Population with present address	Population either with permanent and present address in the same town
Bania	3934	3827	3574
Vetren	3878	3731	3534
Glogjevo	4511	3996	3882
Kostandovo	4460	4422	4246
Slivo pole	3882	3576	3448
Sarnitza	3824	3639	3582
TOTAL	24 489	23 191	22 266

The government of the Republic of Bulgaria declared 6 settlements—villages to be towns with urban status in 2002 and 2003. The first one is Bania (region of Plovdiv)—situated in the central part of Bulgaria—in the southern lowland beyond the Stara Planina Mt. Besides, the settlement is famous for the residence of Prime Minister Simeon Saxkoburggotski (Saxe-Coburg Gotha). The others have taken years to fulfil all the required steps of the declaration procedure. They are situated in two different regions and could be grouped by their nearness. Slivo pole and Glodjevo are situated in the region of

Russe (north central/east part of Bulgaria), close to the Danube and the Danube bridge. The other three new towns are in the south central part of Bulgaria—in the region of Pazardjik. Vetren is situated on the western slopes of the High Thracian basin, but Kostandovo and Sarnitza are in 2 different valleys of the Western Rhodope Mts'., the Chepino basin and the valley of the Dospatska river, respectively. (Figure 1).

Figure 1. Location of the declared towns in Bulgaria in 2002 and 2003

The demographic situation in these 6 new towns is better than that in towns in Bulgaria and differs from that in towns of similar size—between 3000 and 5000 inhabitants. To show it exclusively, like all representation of population characteristics, the present are starts with following the charge in numbers.

The size of a population gives the most general picture about the number of inhabitants of a certain settlement or territory. The investigation of this parameter provides a full picture for the population of the considered points. In the years before the proclamation the new towns show different rates of population increase (Table 2).

The negative rate is due to several factors, typical for the whole country in the last dozen years:

- ageing of population—a decreased number of young people and increased size of population in older age groups;
- negative natural increase with registered maximum values during the mentioned period, resulting from simultaneous mortality-rate increase and birth-rate decrease;

• strongly expressed negative balance for migration from small settlements, and for the country as a whole with respect to emigration;

• a lower living standard;

• an abrupt fall in industrial branch development, with a decreased number or jobs;

• a change in land property and necessity of a person making their own investments in cultivation.

Table 2. Number of population according to censuses

Towrs at the end of 2003	1985	1992	2001	Rate of increase 1985–1992 (%)	Rate of increase 1992–2001 (%)
Bania	3925	4102	3904	4.51	-4.83
Vetren	4894	4521	3888	-7.62	-14.00
Glogevo	4572	4234	3953	-7.39	-6.64
Kostandovo	4045	4220	4351	4.33	3.10
Slivopole	3577	3312	3359	-7.41	1.42
Sarnitza	3285	3606	3650	9.77	1.22
TOTAL	26 283	25 987	25 106	-1.13	-3.39
Bulgaria—urban population	5 811 573	5 714 049	5 474 534	-1.68	- 4.19

However, two of the new towns are marked by a positive rate in each period. That positive rate is due to positive natural increase. The territory of the Western Rhodopes Mt. is not affected by the demographic crisis. Family structures with two and more children still remain in the settlements of the region and in this way the higher rate of birth is provoked. Many authors draw attention to ethnic and religious reasons. The population is predominant by muslim.

The economic changes in the middle of the 1990s provoked the creation of private enterprises and the development of commercial activities in the country. Most villages and small towns remained a bit detached from this process and the negative trends were not moderated during the entire period of transition from a centrally planned to a free-market economy. The mountain-situated Kostandovo and Sarnitza oriented very quickly to use natural resources exclusively. Logging, lumbering and wood production is a specialization of many people. The timber industry is present in almost every second home. The other new towns in non-mountainous areas have more agricultural and food industry prospects.

At the same time, possibilities are appearing in the larger towns for new jobs, and the labour market is being transformed in conformity with the new requirements. There are also no bureaucratic and other obstacles hampering migration towards these towns.

The economic conditions, namely the stagnation of the economy and abrupt fall in earnings at the beginning of 1997, contributed additionally to the negative effects. Except by negative migration balance, this year was characterised by the lowest value for natural increase in the history of Bulgaria—minus 7‰.

The structures of population are the major impact factor influencing the natural movement of population. They are also reflected in teritorial and socio-professional movement.

The age structure exerts an especially strong influence on the natural reproduction and labour resources. The structure of labour capabilities is very clearly reflected in labour resources and the economically-active population. The consideration of such an age structure is connected directly with the labour and retirement legislation of the country, i.e. with the age of labour capability stipulated by the law. The minimum required age is 16 years[1] old and the maximum age in 2001—56 years for women and 61 years for men. The pension age has been increasing gradually since 2000. In this way the population is divided into three basic age groups—below working age, of working age and over working age (Table 3).

Table 3. Distribution of population by the labour capabilities (%)

Towns	Below working age	Of working age	Over working age
Bania	17.39	58.76	23.83
Vetren	18.30	54.82	26.88
Glogjevo	18.81	60.65	20.54
Kostandovo	23.52	61.59	14.89
Slivo pole	20.57	58.76	20.67
Sarnitza	23.46	62.61	13.93
TOTAL	20.36	59.56	20.08
TOTAL FOR THE COUNTRY	16.71	60.97	22.32

It is established from the data in Table 3 that in general outline the age structure is more favourable for natural increase of the population and for labour resource contingent. The age structure of the population in the considered area is better than the average parameters for the country, as is clearly seen from the higher share of people above the active age and the lower share of people of active age or younger than the age of 16.

The region of the Western Rhodopes Mts. is generally categorized as an area with younger population in comparison with the lowland territories. Such territories include the Danubian plain, lowlands south of Stara Planina and Higher Thracian basin. The settlements in the Rhodopes are far enough from attractive centres with better structured units in the sphere of social services, education and culture. So people there stay away

[1] People between 16 and 18 years old need to have permission to work from Labour Inspectorate (Labour Code—Art. 303, paragraph 3).

from the intense migration processes available in the plain areas of the central part of North and South Bulgaria. Psychological factors like the family values and religion differentiation and tradition help to keep the continuing natural reproduction.

COEFFICIENT OF INSTABILITY

This is equal to the sum of the quotients of each age group's share of the new towns and the share of each age group in the population—standard, to the second power, from which is subtracted unity. The population of all urban settlements according to the same census is accepted as standard (Table 4).

Table 4. Distribution of population in 5-year age groups (2001)

	New towns		Total for urban settlements		
Age group	Number	Share (%)	Number	Share (%)	Quotients between shares
0–4	1132	4.90	223 695	4.09	0.293
5–9	1400	6.06	264 139	4.82	0.260
10–14	1843	7.98	367 244	6.71	0.177
15–19	1648	7.13	409 047	7.47	0.128
20–24	1630	7.05	437 741	8.00	0.110
25–29	1636	7.08	431 086	7.87	0.114
30–34	1745	7.55	402 900	7.36	0.139
35–39	1776	7.69	390 279	7.13	0.151
40–44	1818	7.87	411 692	7.52	0.139
45–49	1511	6.54	418 699	7.65	0.112
50–54	1462	6.33	425 718	7.78	0.105
55–59	1313	5.68	313 614	5.73	0.173
60 & over	4191	18.14	978 680	17.88	0.057
TOTAL	23 105	100.00	5 474 534	100.00	1.959

Coefficient of instability $Co_{in} = 1.959 - 1 = 0.959$

For better comparison and to know how the new towns are inserted into the urban population account must not only be take of all the urban population. The last includes the capital Sofia with over 1 million people and the largest cities also. Thus, a look will be taken at the towns of similar size (between 3000 and 5000 inhabitants). 50 towns in Bulgaria enter into this framework according to the same census, and their population is accepted as standard as follows (Table 5).

The obtained coefficient (1.071) shows slight deviation of the new towns' age structure from that for towns of similar size—between 3000 and 5000 inhabitants. The difference is much more significant if the observer sees the deviation from the age structure of the entire urban population of Bulgaria (0.959). It can be seen that the age structure is little more common to the urban population's age structure. The correlation between the populations is strongly indicative.

This is a very interesting result. Urban settlements of between 3000 and 5000 inhabitants have more similar human resources to the rural ones. The new towns declared in 2002 and 2003 are some exception'. They are similar enough to the urban settlements, which include the biggest cities.

Table 5. Distribution of population in 5-year age groups (2001)

Age group	New towns		Urban settlements of between 3000 and 5000 inhabitants		Quotients between shares
	Number	Share (%)	Number	Share (%)	
0–4	1132	4.90	8764	4.44	0.249
5–9	1400	6.06	10761	5.45	0.204
10–14	1843	7.98	13938	7.06	0.160
15–19	1648	7.13	12883	6.52	0.168
20–24	1630	7.05	12310	6.23	0.181
25–29	1636	7.08	12808	6.49	0.168
30–34	1745	7.55	13543	6.86	0.161
35–39	1776	7.69	13318	6.75	0.169
40–44	1818	7.87	13781	6.98	0.162
45–49	1511	6.54	13582	6.88	0.138
50–54	1462	6.33	14194	7.19	0.122
55–59	1313	5.68	11926	6.04	0.156
60 and over	4191	18.14	45633	23.11	0.034
TOTAL	23105	100.00	197441	100.00	2.071

Coefficient of instability $Co_{in} = 2.071 - 1 = 1.071$

CONCLUSIONS

However some of new towns show tendencies revealing a risk of demographic crisis be falling them. It is clear that measures should be taken in the future to increase the rate of natural reproduction, as well as to restrict the migration of population by means of restructuring the economy in the settlements; for example—developing a rural and eco-

logical tourism and creating new labour realisation possibilities, as well as by generally elevating the living standard. In this way the headlong drop could be stopped and it would be possible to retain population.

The closing of economically-ineffective industrial production in the largest cities and towns has led to increased unemployment and a flash possibility for many people to return to these new towns with built social and technical infrastructure.

The development of the forest economy and timber industry in mountainous towns, and of the food industry in plain areas is still insufficient, regardless of the favourable prerequisites. The existence of good conditions for the organic cultivation of forest fruits, mushrooms, herbs, etc., should be noted in this context. Excellent natural-geographic conditions exist for the development of tourism—alongside the mountain-cognitive (sightseeing) tourism, special attention should be paid to the development of rural tourism, involving successfully the elderly population to make available its experience and traditions, life style and culture to visitors. A number of accompanying activities can be realised in addition, which will engage and retain the young and active population in the region.

The main direction to the economic activation of the new towns should be socially effective. The solution of the demographic problems is directly connected with increasing employment of the population, increasing income, restricting negative migration processes and ensuring conditions for sustainable development and a higher living standard.

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MAIN PROBLEMS IN ESTABLISHING SUSTAINABLE ECONOMIC DEVELOPMENT OF UKRAINE

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INTRODUCTION

Ukraine, a country in transition, has now a great many problems at present, problems inherited from the former USSR and cumulated during 10 years of independent development. The ways of overcoming these problems will determine the future position of the state in the world economic system. Ukraine has set a course for sustainable development and is aware of the necessity to adapt its national economic system to the influence of international integration processes. It is for this reason that the country is trying to devise such a model for its development, as will ensure that internal and external growth factors would not contradict, but rather complement, each other In this connection, Ukraine (as well as other underdeveloped countries) should constantly verify the ratio between the advantages it could have from an intensification of agglomerative processes, and possible negative consequences of globalization.

We define sustainable economic development as long-lasting and stable economic growth (Shubravska 2004). In this connection, a balance should be maintained, not only in the process by which structural elements of the economic system cooperate, but also as regards cooperation of the economic system as a whole with the social and ecological spheres. Sustainable economic development is this part of sustainable development, as the UN commission confirmed while at the same time implying the structural balance in the economic system.

THE MAIN TRENDS OF THE MODERN SOCIOECONOMIC DEVELOPMENT IN UKRAINE

The main problem needing to be solved as soon as possible is the achievement of stability in economic development and the overcoming of the comparative weakness of the national economic system of Ukraine. The long-term economic regress of the country

was caused by the government's inadequate determination when came to reforming the market, and the simultaneous reduction of the government's regulating role in the circumstances of sharp structural in balance of the national economy. Over more than 12 years of state independence, following the USSR's disintegration, Ukraine was only able to overcome an annual reduction in GDP in 1999, and then to achieve its accretion. The dynamics to this process are seen in Table 1. Last year, GDP per capita at present prices, calculated in line with the annual official rate was at more than $900 (*Statistical Yearbook* 2003). Further GDP per capita, calculated in line with the purchasing power parity was only about one tenth of that in the USA (*International...* 2003). Industrial production in Ukraine declined until 1999, but in the next four years began increasing annually to 10%. In 2004 the growth of GDP was of 13,5% while industrial production has 14,7% up on 2003 (*Express...* 2004). Notwithstanding such growth tendencies over the last five years, it is still impossible to estimate their stability. First of all, this period is not long enough for conclusions to be drawn about overcoming instability. Besides, our decline was too deep.

Positive changes are also observed in the development of domestic investment processes (Table 1). Though the size of foreign investments in the Ukrainian economy increase annually, there are still very few of then. According to the State Statistics Committee of Ukraine the total sum of foreign direct investment at the beginning of 2004 was of 6.7 billion dollars, or more than 150 dollars per capita. So we can state that the contemporary indicators of Ukrainian economic growth were achieved mainly thanks to internal sources. This distinguishes us from, for example, the new members of the European Union, which received 3 or 4 times more foreign investment (Poland 9 times).

Table 1. The main indicators of economic development in Ukraine, 2000–2004 (% cf. previous year)*

	2000	2001	2002	2003	2004, 1st half
GDP	105.9	109.2	105.2	109.4	112.7
Per capita GDP	106.7	111.1	106.3	110.3	
Agricultural production	109.8	110.2	11.2	89.8	97.7
Industrial production	113.2	114.2	107.0	115.8	115.9
Fixed capital investment	114.4	120.8	108.9	131.3	152.1**
Foreign direct investment	118.0	118.0	120.0	122.0	
Real wages	99.1	119.3	118.2	115.2	
Retail trade turnover of enterprises	108.1	113.7	115.0	120.5	120.2
Exports of goods and services	118.8	109.7	111.1	124.1	151.3
Imports of goods and services	116.6	112.0	107.4	134.7	132.5

* According to the State Statistics Committee of Ukraine.

** 1st quarter of 2004.

So foreign investment resources obviously, do not exert a significant positive influence on the economic situation in Ukraine.

As to inflation and unemployment rates, they are mainly increasing in Ukraine. In the years 1990–2003, consumer prices increased almost 4 times (3.8 fold). The unemployment rate in 2003 was of 10%. Such an important internal growth factor as the great absorbency of the home market is not used enough. In spite of the increase in household monetary expenditures and savings, starting from 2000, these remain considerably below the market's potential to absorb. According to our calculations, the present potential absorbency the of Ukrainian home market is approximately 6–7 times higher than the actual rate.

The structure of the Ukrainian economy also differs from those of the developed industrial countries.

Great problems for the economy of Ukraine are posed by the servicing of debt, which represents approximately almost a quarter of GDP. It is also worth mentioning that the solving of economic problems is greatly complicated by the corruption and criminalization of all spheres of Ukrainian society. The indices of corruption in Ukraine (as well as Russia) are very high. During 1998–2003 they were twice as high as in the countries of Central and Eastern Europe (Kalman 2004).

A great socioeconomic problem for Ukraine, as well as for many former Soviet countries, is marked reduction of the population. According to UN estimates, the population of Ukraine may have decreased by up to 10 million by 2050.

Certain hopes concerning an improvement in the economic situation can be derived from acceleration of the national economy's integration into worldwide structures. That is why it is very important for Ukraine to take account of possible negative consequences of globalization, and to use its advantages the full.

BASIC PROBLEMS OF UKRAINE ON THE WAY TO GLOBALIZATION

The first problem concerns the increased level of integration level of the national economic system as set against poor development of the domestic market. Exports[1] and imports of goods accented for more than 90% of GDP in 2003 (against 75% in 1997). The increase of the internal orientation of the Ukrainian economy, together with the degradation of the home market is a potential destabilizer of the country's development.

The second problem is the prior raw-material-oriented structure of national exports (Table 2). The supply of ferrous metals had the greatest specific weight in total Ukrainian exports—accounting for about a third part, while machinery represented only 10%. The food exports of Ukraine were more than 50% from raw products (of 11% in 1993 and 30% in 1997). Apparently, this situation will obviously leave Ukraine deadlocked in the long term. The further expansion of raw material exports is connected with the appearance of structural disproportions in economic development, the destabilization of the ecological status of territories and other negative consequences.

[1] Our export is now 24 billions of dollars.

Table 2. The content of goods in the total export of Ukraine, 1998–2004* (%)

	1998	1999	2000	2001	2002	2003	2004, 1st quarter
Base metals	42.2	42.1	44.4	41.3	39.9	36.7	38.8
including ferrous metals	33.3	33.6	34.5	30.6	30.0	29.3	31.2
Mineral products	9.2	10.1	9.6	10.8	12.5	15.3	13.9
including ores, slag	4.1	3.1	3.2	2.6	2.5	2.3	1.9
Grain crops	2.5	4.4	0.8	3.0	5.4	1.7	1.3
Machinery, equipment	8.7	7.9	9.3	10.5	7.0	10.3	10.0

* According to the State Statistics Committee of Ukraine.

The next problem is the inadequate diversification of import sources and consumers of Ukrainian exports. In spite of some reduction in the level of foreign trade turnover with the main partner—Russia, the role played by this country represents about 40% of total volumes of national import and almost a quarter of exports. The Ukrainian economy depends greatly on energy imports of crude petroleum and petrochemicals in particular. So, price instability on the world petrochemicals market, the high level of energy intensiveness in Ukraine (per $1000 GDP, calculated according to purchasing power parity, it is almost 3 times as high as in the USA <http://www.un.org>) and monopolization of the home energy market, all increase business risks greatly and destabilize national economic development.

The next problem is the limited entry of Ukraine on to the commodity markets of the developed countries. Ukrainian exports to the developed countries of Western Europe and the USA accounted for only 20% of the total for 2003. The trade of raw materials is still rather free with these countries.

The next very important problem is the increased outflow of highly skilled manpower from the country. About 1500 scientific workers emigrated from Ukraine in the years 1995–2003 and rates of departure increase annually. The reason is the bad economic environment in the country and the liberalization of emigration regime, ensuring that a so-called brain drain is taking place.

One of the main problems for Ukraine in connection with the further development of the integration processes is an element of uncertainty as regards the choice between the East and the West as regards partners in the form of economic unions.

A serious socio-economic problem is the aggravation of social disparities and growing property stratification in society. According to the World Bank, the 1999 difference in expenditure levels between the most lowly and best-off strata of Ukrainian society was about nine fold, or twice as much as in Russia and the USA. The Gini coefficient for Ukraine rose 1.5 fold post 1993 and is now equal to 0.359, confirming the uneven distribution of income. According to UNESCO, 4% of the population of Ukraine was starving during 1999–2001 <http://www.un.org>.

As has already been mentioned, the establishment of sustainable economic development requires that stable growth rates and inner structural balance of the economic system are achieved, as well as coordination of its development with the social problems in society and regenerative capacity of the environment. Only in such a case will the rise in quantitative indices for economic growth comply with quality input. And this is the essential requirement for the achievement of socioeconomic stability, as well as sustainable development as a whole.

Nowadays there are more than 1500 industrial enterprises functioning in Ukraine. There are more than 300,000 tonnes of dangerous chemicals (eg. 9,000 tonnes of chlorine and 200,000 tonnes of ammonia) being stored or used in production. And, overall, there are more than 17 million people (35% of the population) living in areas of potential chemical contamination (*Environmental...* 2004). Table 3 presents the environmental pollution in Ukraine in the period 1985–2001.

The major ecological problems of Ukraine on its path to sustainable development have in many cases or soon may assume international dimensions. This is above all true of the problems inherited from the times of the former USSR, notably Chernobyl, and also military-ecological problems, concerned with the storage of ammunition and toxic substances, left by the Soviet army. Secondly, there is a problem of ecological safety, dealing with floods in the boundary river basins (eg. of the Tysa). Thirdly, there is the problem of technogenetic ecological safety of industrial plants faced with a high risk of accident (of which there are more than 140 in Ukraine). Besides, one more problem for Ukraine concerns upholding international commitments and agreements of transnational environmentaly-oriented importance. Included here above all are the: Convention on Biological Diversity (Rio De Janeiro, 1992), Convention on the Protection and Use of Transboundary Waters and International Lakes (Helsinki, 1992), Danube River Protection Convention, Convention on the Protection of the Black Sea Against Pollution (Bucharest, 1992), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on the Conservation of Migratory Species of Wild Animals, and so on.

Table 3. Environmental pollution in Ukraine, 1985–2001*

Indicators	1985	1990	1994	1995	1996	1997	1998	1999	2000	2001
emissions, hundred tonnes										
• to atmosphere	18777	15549	8347	7484	6342	5966	6041	5853	5909	4055
• to surface-waters	8956	9706	12386	12282	11895	9541	9181	8917	9108	8676
• to ground resources			75680	75605	60773	60773	60136	57704	49420	45928
emissions per capita, kg										
• to atmosphere	369	300	161	145	124	118	120	117	119	83
• to surface-waters	176	187	239	238	233	188	183	179	184	178
• to ground resources			1457	1956	1481	1186	1195	1156	998	944

* According to the State Statistics Committee of Ukraine.

CONCLUSION

The most important problems for Ukraine on its path towards sustainable economic development are caused by:

- the legacy of the USSR and, in particular, the structural disproportions that still can not be overcome;
- the incapable state apparatus, and, above the corruption in state authorities and lack of control on their part.
- the low income levels of the greater part of the population;
- the lack of decentralization of the country's economic development, resulting in concentration of all resources and functions among central state authorities;
- the low level of development of small business;
- imperfections of the state financial system and, in particular, the under-developed financial markets, and weak state taxation system;
- delays with joining the WTO;
- the failure to capitalise advantages of the geopolitical location of the state, as a kind of buffer between East and West.

The efforts to achieve sustainable economic development of Ukraine should therefore be concentrated in these directions.

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UKRAINIAN INTERREGIONAL COOPERATION IN THE CONTEXT OF ENLARGEMENT OF THE EU

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Key words: Ukraine, enlargement of the EU, interregional cooperation, cross-border regions

The enlargement of the EU is a unique opportunity to integrate the countries of the European continent by distributing stability and prosperity zones in the new Member States.

Since May 2004 Ukraine has had a direct border with three EU Member States, and in the long term the entire western border will represent an almost continuous strip of Ukraine bordering with the EU. It can become both a zone of opposition, and an area of fast socio-economic growth.

The border itself is a barrier: formally and legally; in terms of infrastructure; physico-geographical (orographical, hydrographic and ecological); economically; psychologically [4], and also geopolitically. But at the same time it can be a factor in integration at a certain level of openness.

The threats of the non-alignment of Ukraine with European structures have their basis in the implementation of an alternative undesirable from both the political and the economic points of view as regards scenarios of geopolitical orientation.

Therefore, the important factor in the regional European integration strategy of Ukraine is the geopolitical one. Taking into account the geopolitical and geo-economic situation of Ukraine, it can play an important role in the interaction of the European, Euro-Asian and, Asian-Pacific economic groupings, serving in the role of an economic bridge.

In current conditions, Ukraine is not yet able to be considered such a bridge, as: there is a border, the crossing of which requires much time for the population, for motor transport: a need to overcome obstacles to rail transport (differences in gauges), insufficiently developed transport, financial infrastructure etc.

For Ukraine, the consequences of the EU's enlargement can be both positive and negative.

The advantages can be possible improvement of the trade regime, and access for Ukrainian goods and services to Member States' markets. This is connected with the

automatically distributed action of the Ukraine-EU Partnership and Cooperation Agreement for these countries, which, with a degree of mutual trade liberalization come near to WTO norms.

Besides, the EU's external customs tariff is lower than national tariffs of the countries, which are due to the EU. They should refuse some quantitative restrictions on Ukrainian import. It is necessary to consider that, in the new Member States there will be an introduction of a uniform transit regime, and civilized customs, that will reduce losses to Ukraine due to goods smuggling and customs infringements.

For Ukraine the consequences of EU enlargement can also be negative, resulting from:

- a reduction in trade flows (relative reduction of export and import), that can result in a deterioration of the trade balance;
- a decrease in export on to the EU market, which can affect export prices for Ukrainian manufacturers, and the reduction of imports, worsening the conditions for trade.

The new Member States are in deficit in their trade with the EU. It means that these countries will try to expand exports on to the EU market. It is possible to expect an aggravation of competition between Ukrainian manufacturers and manufacturers of the new Member States on those commodity markets, where Ukraine enjoy competitive advantages (e.g. electrical equipment, power machines and equipment, clothes and accessories, furniture, black metallurgy).

It is necessary for account to be taken of the incompatibility of EU and Ukrainian foreign trade structures, which EU enlargement can amplify. This is linked to peculiarities in national manufacturing structure and the limited competitiveness thereof.

Besides, for as long as it is not a the WTO member, Ukraine can not counteract the possible application of anti-dumping measures from new EU members.

The expansion of the Schengen zone to the east and introduction of a visa regime with Poland, Hungary, Slovakia and the Czech Republic will result in a change of migration policy and in problems for small and medium-size enterprises.

In such conditions, the important factor of Ukraine's involvement in processes of European integration is enforcement of border regions' economic integration. The examples of such integration are provided by regions along the German-Polish border between Dresden and Wroclaw, between Prague and Nuremberg and between Trieste and Ljubljana. This is due to the importance of such regions in the maintenance of geo-strategic interests in an integrated Europe. And for Ukraine they will play an essential role in the maintenance of its international cooperative development.

With enlargement of the EU, the contact function of the border is amplified. At the same time, there are a number of problems which interfere with this function's performance. First of all they are connected to a low level of border infrastructural development (insufficient quantity of border crossing points, in particular for pedestrians, customs items etc.).

The proximity to developing countries that Ukraine has gained as a result of EU enlargement, creates for cross-border regions, certain economic advantages on the one hand, and on the other many problems connected with competitiveness of not only local, but also national manufacture, cross-border migration, the struggle with smuggling and protection of the environment.

In the strategy for Ukraine's European integration the role of advanced posts and important links in international economic cooperation is assigned to boundary regions. The development of the foreign economic relations of these regions should compensate for their remoteness from the main economic centres of the country. Such communications form the basis for the development of interregional and cross-border cooperation. Cross-border communication appears in politics, the economy, environment protection, culture, education, and demographic regulation, within a certain cross-border territory that covers two or more regions of the boundary states and unites them in line with certain geopolitical, social and historical attributes.

A special role in the development of interregional cross-border cooperation is played by geopolitical, historical and ethnic factors. Interregional cooperation is a part of the European political integration process. The process of integration favours a gradual reduction in the negative effects of borders, in particular those ones which existed historically. It favours activation of border territories' economic development, the search for complimentary structures of their economy with help from the EU and formal and informal communications between the populations from both sides of the border which breaks the barriers created by a border.

Such cooperation helps to solve the problems posed by ecological threats, while communications development can determine a regions' stability and socio-economic development, and its place in the international arena.

Interregional cross-border cooperation is directed towards:

- the resolving of the labour market problems of border territories;
- the development of professional education;
- the development of transport infrastructure; telecommunications, tourism; science and culture;
- the expansion of trade and economic relations; assistance in the development of small and medium-sized enterprises;
- environment protection;
- coordination in the shopping of development and spatial planning strategy;
- regulation of migration flows, creation of new jobs and liquidation of unemployment;
- the information exchange, in particular as regards environmental monitoring and in increase in competitiveness of border regions;
- the transfer of technologies developed on the basis of cooperation between universities and research institutes and exchanges of students and scientific employees.

The processes of integration penetrate into all spheres of life (politics, the economy, culture, environment protection). Integration overcomes political and institutional borders and develops the process of a region's international cooperation. Regionalization in the context of EU enlargement east wards will play an important role during further European integration, reducing possible negative consequences of the EU enlargement for Ukraine. Interregional cooperation will take on new features.

In the program 'Europe 2000-plus', the purposes of interregional cooperation are defined, in particular as: experience and information exchange, alignment and improvement of living standards; assistance in development of the economy and trade; develop-

ment of infrastructure, transport and tourism; environment protection, cooperation in spatial planning, scientific, cultural, sports and youth exchange cooperation and other kinds of cooperation.

On the interregional level it is necessary to develop the general projects, that should become the driving force of development for these regions, to form an interregional strategy of spatial development, which provides:

- favourable conditions for urban and rural development;
- a strengthening of business, development of small and medium-sized enterprises, support for local employment initiatives;
- adaptation of the labour market;
- the attraction of money into education, culture and public health services;
- environment protection, development of the power industry and renewable sources of energy;
- development of transport (in particular environment-friendly transport), communications and power systems;
- improvement in cooperation in the legal sphere, including improvements of external border security;
- development of a spatial strategy for the sustainable economic and social development of border areas;
- transfer of technologies, research and exchange of experience in spatial planning;
- improvement in infrastructural support for border areas.

The accession of Ukraine on July 14, 1993 to the European Framework Convention on the basic principles of cross-border cooperation favoured the development thereof between communities and authorities, and also favoured interregional cooperation on the basis of the establishment of Euro-regions accord once with multilateral agreements with neighbour countries.

This is connected to the fact that stimulation of cross-border communications development quite often results in dissociation that is mutual penetration of regions and establishment of common formations (Euro-regions, technological parks, etc.). The basic question, which it is thus necessary to pose, is whether such association will give additional competitive advantages to border areas or cause possible loss of their previous advantages.

It is necessary to note, that there are differences in establishment of Euro-regional structures in the EU and post-communist countries. While for Western European countries, the grounds for their formation are concern improvement of relations between Member States, the objective for Central and Eastern European countries is restoration and expansion on a new basis of interregional cooperation. But there are also common, Europe-wide priorities of sustainable development and the construction of the Trans-European communication networks.

Euro-regions will play an important role on Ukraine's path to European integration. On April 29, 2002 the Ukrainian government accepted the Program of Euro-region development, which was devised with the aim of creating appropriate conditions for the activation of Ukrainian regional participation in cross-border cooperation. In line with this Program, the basic tasks of the further development of the Ukrainian Euro-regions are:

• support of mutually advantageous communications with neighbour countries, candidate countries and EU Member States;

• implementation of measures for the gradual elimination of obstacles (administrative and legal) that constrain development of cross-border interaction;

• adjusting Ukrainian legislation on regional cooperation to the international norms;

• granting legal, informational, methodological and organizational assistance to local bodies of executive authority and bodies of local government as regards participation in cross-border cooperation and Euro-regions development;

• financing of appropriate measures from the state budget;

• participation in the implementation of projects that are supported by foreign states and international organizations;

• favouring the attraction of international technical assistance and financial help from specialized funds of international organizations.

For the period since 1993 four Euro-regions have been established with Ukrainian participation: Buh , Lower Danube , Upper Prut and Carpathian Volynsk, Chernovtsy, Zakarpatye, Odessa, Ivano-Frankivsk and Lviv districts are involved in their functioning on the Ukrainian side, while administrative-territorial units of Poland, Belarus, Romania, Slovakia, Hungary and Moldavia are the foreign states involved.

Euro-regions are the most effective form of interregional cross-border cooperation. They are based on formation of the highest-level integrated structures of the Euro-region Council, its Secretary, Working groups, Committees of management, etc. These groups work directly with the specialized regional and international bodies that coordinate this cooperation.

Western boundary regions can contribute significantly to the implementation of Ukraine's integrational strategy:

• To develop the Western-Ukrainian system of fuel stations due West. The markets of South-East Poland, East Slovakia, East Hungary and North-East Romania are much closer (up to 500 km) than large consumer centres in Ukraine. Thus Ukraine can liberalize trade in raw materials and the products of oil processing at Central European prices.

• To intensify cooperation between Ukraine and Hungary in the field of oliphen, polyphen and high molecular chemistry production, which is caused by the increased demand for these products in the countries of Central and Eastern Europe. It is important to open up goods-exchange between Kalush (Ivano-Frankivsk district) and Tissavashvari (East Hungary).

• To supply introduction of the oil-pipeline between the Black Sea and Central and Eastern Europe. For implementation of this project it is important to establish a consortium between the three countries of Ukraine, Russia and Germany. This pipeline will be of significance for such oil refining enterprises as Borza, Zhazhalombata, Tissalivari, Strazhko, Hlynych, Jaslo, Plock and others).

• To finish construction of a highway between South-West Poland and Lviv district, connecting it with a Trans-European network.

• To ensure harmonization of railway communication between Central and Eastern Europe and Ukraine (Lviv district). The project provides continuation of a railway line in

line with Western gauge standards between Mostyska and Lviv. It can become a transport corridor of vital importance as a bridge between Ukraine and EU.

• To develop unity systems between the post-Soviet and Central and Eastern Europe systems. The two possible competing projects are: modernization of system connection to a constant current Burshtyn (and parallel, Doprotvir) station towards Slovakia and Hungary, an increase in capacity up to 800 MVt with an opportunity for system integration in a single unit. Such a decision provides switching-off the Western-Ukrainian network from other part of the country. The second project provides connection of two large systems through integration to a constant current system. These two decisions require improvement of the Ukrainian network of electrical power supply.

• To raise the standards of processing of waste water to the European level in all small and medium-sized cities of Western Ukraine. In the given time capacity for such processing is not available, so industrial and household sewers discharge into rivers (the Bystrytsya, Dnister and Prut) in enormous amounts without purification. As a result, regions, situated along the river banks (Moldavia, Odessa, the Black Sea) are highly polluted. The introduction of Central European technologies and standards in Ukraine can be achieved through implementation of experimental projects in the Western region. This region, due to its geopolitical arrangement and natural resources, is very important from the point of view of supporting minimal ecological standards.

• To bring tourist infrastructure in the Western region, in particular the Ukrainian Carpathians (Yaremche-Vorohta National Park, Truskavets, Skhidnytsya, tourist resort in Slavske) into compliance with European standards. Romania and Poland have tourist centres in the Carpathians recognized at the international level. In Ukraine the existing centres should be reconstructed on the basis of privatization. On same basis it is necessary to create new tourist centres and to develop wider green tourism .

• To favour an increase in knowledge of foreign languages among the experts working on infrastructural objects. For example, an obligatory knowledge of two languages (English and German) is required for personnel of the Ukrainian relay centre, which should be connected to the Central European electrical system.

• To ensure an increase in the use of telecommunication services from Western Europe. Today Ukraine communicates with the world through a network that must be brought into compliance with international standards.

An important role in putting the integrational strategy for Ukraine into effect, in the context of EU enlargement is given to the regional representatives of authority, their responsibility and goodwill, as regards adaptation of regions' economic structures to international requirements. Major significance in modern circumstances is attached the factor of personal relations.

A significant contribution can be made by commercial and industrial chambers, providing businesspeople with the necessary information concerning the opportunities for international (above all) cross-border cooperation.

It is necessary to search for new forms of industrial cooperation, common use of infrastructure, use of nature, environment protection and humanitarian cooperation.

The features of Ukrainian geopolitical space are determined by its high transit potential. It can play a role as a transport bridge, connecting important directions of

international trade routes between Europe and Asia, and with Northern Europe, the Near East and countries of Africa. In modern conditions, transit services account for 80–90% of transport services export. But among world export volumes in transport services Ukraine's share is only of about 1.00 %, while the other European countries shares are France—6.01 %; Germany—5.94 %; The Netherlands—6.25 %; and Denmark—2.14 %.

Ukraine takes one of the first places in Europe in terms of transit potential. This determines the necessity for accelerated development of transport infrastructure, the creation of a national network of international transport corridors, and integration into transport systems of Europe, Asia, the Baltic and Black Sea regions.

An important place in Ukrainian economic and social policy strategy for 2000–2005 is assigned to the comprehensive program of the status of Ukraine as a transit state, which provides:

- activation of work on the creation of a national network of international transport corridors in line with the international standards, and its integration into the transport systems of Europe, Asia and the Baltic and Black Sea regions;
- development of cooperation with international transport organizations;
- integration of Ukraine with international conventions and agreements in the field of international transport;
- simplification of procedures at border crossings in Ukraine;
- implementation of the projects, providing for participation of Ukraine in the formation of road, transport and boundary infrastructure, and the introduction of new transport technologies in line with EU requirements.

Pipeline transport is of major significance (Druzhba oil pipeline that passes through Brody towards Stryj and Zakarpattya, and further towards European countries. There are also three automobile crossing points (Shegini, Krakovets, Rava-Ruska) and three railways (Mostyska-2, Khyriv, Rava-Ruska) functioning on the Ukrainian-Polish border. A significant part of E-W transport flow passes via the railway and automobile crossing points of Yagodyn and Krakovets. Here intensity of motor transport traffic is of about 5000 automobiles per day. Possible percentage growth is of 10–15%.

European transport corridors 3,5,7,9 are formed on the territory of Ukraine. Each of these corridors extends up to 200 km across the direction of movement and provides not less than two means of transport and high-quality information and communication services.

Also important is the construction of the Lviv-Krakovets highway as part of the international transport corridor of Berlin–Dresden–Wroclaw–Lviv–Kiev. It will be connected to the existing M–06 Kiev–Lviv–Chop highway.

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STATE AND PROBLEMS OF UNEMPLOYMENT IN BLAGOEVGRAD DISTRICT DURING THE TRANSITION PERIOD

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Key words: Blagoevgrad district, employment and unemployment, labour market

INTRODUCTION

The district of Blagoevgrad is situated in South-western Bulgaria. In term of area it ranks third after the districts of Sofia and Bourgas (accounting for 5.8% of the country's area) and by population sixth (4.3% of the national total) (Figure 1). It has an important geopolitical and economic-geographical position and is a key cross-roads. It is crossed by highways of national and European significance, oriented from Western and Central Europe to the Near and Far East. The district is remarkable for its diverse relief. Some of the highest mountains, not only in Bulgaria but also on the Balkan Peninsula, rise here (such as Rila and Pirin). The rivers Struma, Mesta and Strumeshnitsa have formed their impressive valleys here and, the district is in general endowed with a considerable array of natural landmarks: the pyramids near Melnik, the extinct 'Kozhuh' volcano and the mineral springs which attract many tourists and thus give impetus to the creation of new jobs in this sector. The land resources are in contrast limited. The share of arable land is 13.2% representing is 2% of the national total. Wooded areas account for the largest share of the land here.

During the years of transition from a centrally-planned to a market economy, fundamental changes have taken place in the branch specializations of the district. Among the chief branches today are the manufacture of food, beverages and tobacco products, of medicines, of wood and wood products, of clothing and footwear and of metal products. The private sector is of increasing importance as regards employment, both at a national and a regional level. The greatest number of employees is in the manufacturing industries, followed by the other main economic sectors—trade, services and agriculture.

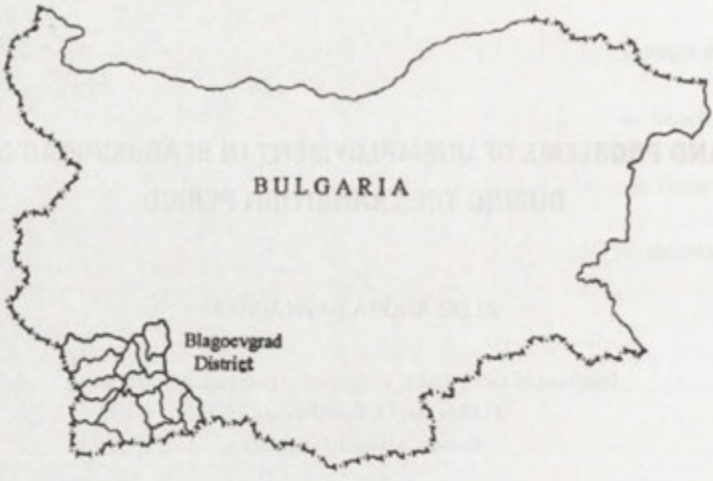

Figure 1. District of Blagoevgrad

STRUCTURE OF UNEMPLOYMENT IN BLAGOEVGRAD DISTRICT

Analysis of spatial changes in the numbers registered unemployed persons indicates the place of the Blagoevgrad district as set against the remaining districts in Bulgaria. In 2003, the unemployed in the district represented 3.4% of the Bulgarian total. Compared to 1993, the share was lower by 2%. Generally, changes in unemployment have corresponded to those in levels of employment, which began to decline as early as the 1980s, but experienced its most drastic decrease in the years 1991–1994. In 1990, those employed in Blagoevgrad district constituted 4.3% of all in work in the country as a whole, while by 2003, this share had declined to 3.1%. Over 1990–2003 the number of employees decreased by 34 000 in absolute terms. This reduction in employment was a consequence of demographic and economic factors—a restriction of the working-age population, birth rate decline, intense outward migrations, economic restructuring, etc. Employment reduction started towards the end of the 1980s, but reached its highest rate of decrease during the years 1991–1994. This period was notable for the greatest number of layoffs as a result of large-scale redundancies at the large enterprises manufacturing machines, food products, beverages and tobacco, cellulose and paper products, and wood and wood products, as well as in the light industry and mining sectors. During subsequent years, considerable variations were established in the number of unemployed people, owing to structural reforms in the economic sector, the finalization of most privatization projects, the seasonal nature of some businesses, the large numbers ceasing to be registered unemployed emigration, etc.

A characteristic feature of the district is the seasonal increase and decrease in jobless totals, reflecting employment or discharges in the tobacco manufacturing enterprises, reliant on tobacco growing, as the primary economic branch and source of employment. The Gotse Delchev Labour Office registers the largest numbers of unemployed. Accord-

ing to binding legislation in Bulgaria, farmers who grow tobacco have to be registered as producers in order to obtain government subsidies. This affects the unemployment level. During the period of investigation, unemployment rates here were lower than the national average. In 2003 the rate was 10.5%, i.e. lover by 3.7 percentage points than the national average, something which is attributed to the specific branch structure of the economy in the district (Figure 2).

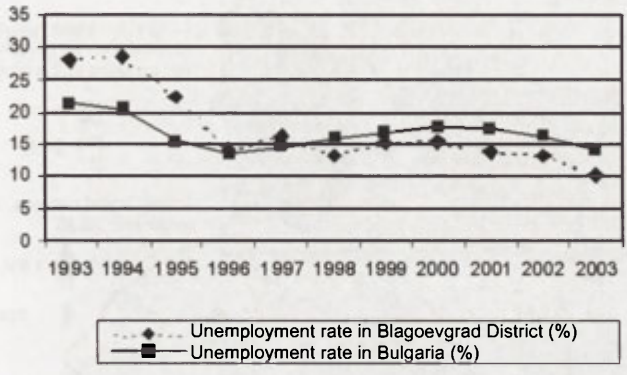

Figure 2. Unemployment rate in Blagoevgrad District and Bulgaria

The analysis on levels of unemployment in Blagoevgrad district reveals differences between the 5 Labour Offices serving 14 municipalities. Higher-than-average unemployment for the district can be noted at the Labour Offices in Razlog (20.1%) and Gotse Delchev (8.5%)—2003 data. These two offices are also notable for having the highest shares of long-term unemployment. The reason is that they are in municipalities with less-developed economics, in which almost all industrial plants and workshops have been shut down. The unemployment rate as indicated by the Labour Office in the town of Blagoevgrad is roughly equal to the average for the district, as compared with below-average figures in Petrich and Sandanski, with—7.5% and 7.3% respectively.

Age, qualifications and education are the key factors influencing the unemployment level, employers' criteria for recruiting personnel and job opportunities afforded to jobless males and females.

The gender-related structure of unemployment in the country, and particularly in Blagoevgrad district, depends both on the total number of unemployed persons and the economic situation.

The district's disproportion in the ratio between unemployed males and females is less marked than at national level. In 2003, the male/female ratio was 48.5:51.5, i.e. not substantially different from the 1995 ratio of 47.4:52.6. Women are affected by higher and more continuous unemployment than men (Figure 3). A greater share of unemployed women as compared to the average for the district can be noted for the Labour Offices in Razlog and Blagoevgrad. Unemployed men prevail at the Labour Offices in Sandanski and Gotse Delchev.

Among unemployed women, it is the group of unmarried mothers who fail to enjoy equal status on the labour market. About 80% of them are registered without any right to unemployment benefit, making their prospects for bringing up children seem rather gloomy. Almost half of them are jobless young women under 29. To support the young and unmarried mothers the 'Employment Agency of Unmarried Mothers and/or Mothers with Children under the Age of Three' takes active measures aimed at their securing permanent employment.

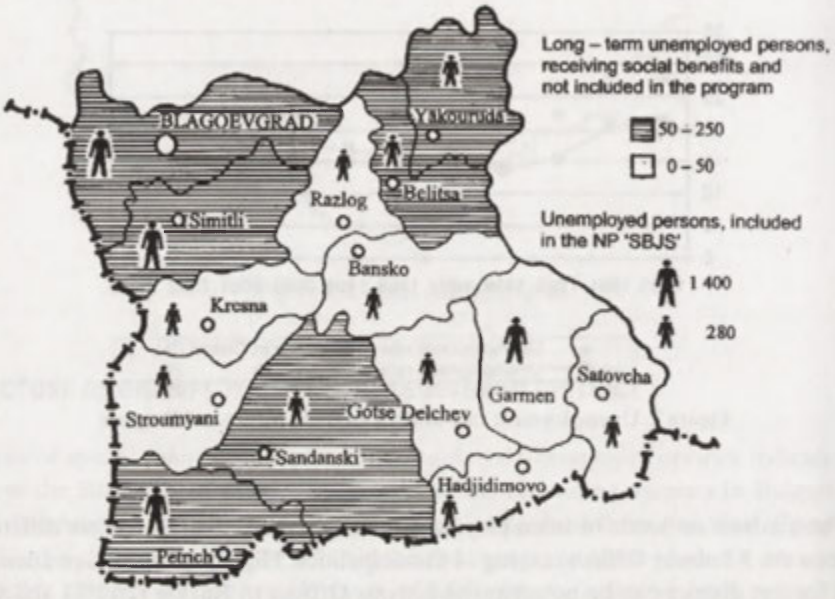

Figure 3. Implementation of the national program 'From social benefits to job supply in 2003'

A Very important problem is that of youth unemployment. In 2003, the registered unemployed, aged under 29, represented 1/5 of the total in the district. Their share is nevertheless lower than the average for the country. In comparison with 1995, the number of unemployed young people has decreased. The share is higher among unemployed young people without qualifications and with just secondary or even primary educational attainment—something which impedes their finding a job (Figure 4).

The other age groups below 55 have also experienced a decline in the share of unemployed persons. Most affected by unemployment are those over 50, who are faced with the worst job opportunities, because of poor mobility and a negative attitude on the part of employers.

In considering the analysis as regards the professional structure of the unemployed in the district, it becomes obvious that the number of jobless workers is tending to decrease, unlike the number of unemployed specialists. This second category of unemployed persons in the district (17.4% in 2003) constitutes a share slightly than in the country as a whole (17.1%—2003). They are primarily people who have specialized in the humanities, pedagogic and engineering. Most of them have graduated recently and have not so far

had the opportunity to begin work. The situation is further aggravated by the fact that employers usually require young specialists to have several years of service.

The share of unemployed people without any special education still remains the highest. These are also the major component within the group of continuously unemployed persons, due to low-level qualifications and education, and to poor mobility. In 2003 they accounted 57% of all unemployed people and denoted an increase of 5.4 percentage points as compared with 1995 (Figure 5). Their share is lower than the average for the country (60.9%—2003) but in three of the Labour Offices (Gotse Delchev, Petrich and Sandanski) it is higher than the average for the district.

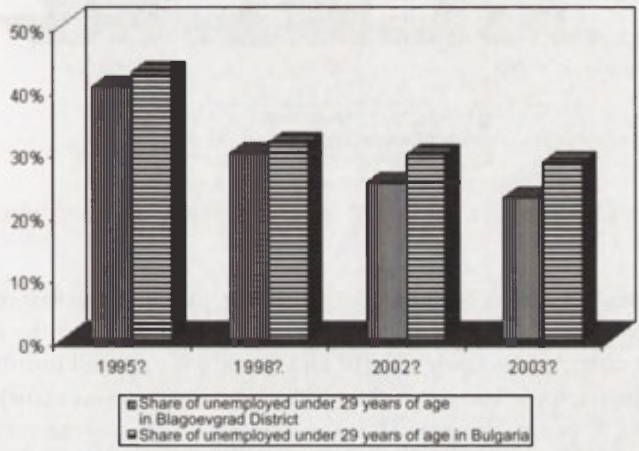

Figure 4. Share of unemployed people under 29 years of age in Bulgaria and Blagoevgrad District

Unemployment is closely associated with the workforce's educational level. A characteristic feature of the unemployment in the district is that over half of those registered with Labour Offices have a low educational level (50.8% as of 31 December, 2003) which prevents them from finding a job. At the same time the district total for jobless people with a university education is increasing. Most of those in question are young, aged below 29, or else older than 50. Their share is higher than the national average (6.6%). The number of unemployed persons with secondary special and secondary vocational education is tending to decrease.

The regional analysis indicates that the share of unemployed people who have stayed on the labour market for longer than a year is growing, and that the duration of their registration as unemployed depends on their qualifications. Simultaneously, the existing trend towards a decline in the number of unemployed persons who have been registered on the labour market for less than a year is continuing. In 2003 they were 53.6% of all unemployed in the district, i.e. their share was higher than the average for the country (46.7%). In recent years, this share has diminished, mainly as a result of the implemented National Program 'From Social Benefits to Job Supply'.

Figure 5. Professional structure of unemployment in Blagoevgrad District

The slow rates of ongoing economic restructuring, the small number of newly-established private firms and the inadequate investments adversely affect the labour market in Blagoevgrad district. The newly-created and vacant jobs are still insufficient, though the number of unemployed people, applying for one vacancy is lower compared to other districts. In 2003, 10 people competed for each vacancy, i.e. 5 fewer than at national level. There is a persistent trend, which started in 1999, for the number of vacancies in private enterprises to grow; in 2003 these accounted for 72% of the total number.

Most vacancies are available in the following economic sectors: manufacture of clothing, of textiles and knitwear, and of food, beverages and tobacco; trade; repair of automobiles and household equipment; and agriculture. The Labour Offices in Blagoevgrad and Sandanski provide the greatest number of vacancies and the Labour Office in Razlog the smallest.

LABOUR MARKET POLICIES

The labour market policy is directed towards increasing the demand for and reducing the supply of workforce, with a view to limiting the spread of unemployment and shortening its duration. About one third of the new jobs have been created through employment programs financed by the government. It emerges that more important for the normal functioning of the labour market are the active measures, an account of the passive ones requiring a great deal of financing and having short-term effects only. A priority component of the active labour market policy is training of a workforce (Figure 6). Various training programs have been devised with the aim of the qualifications of staff being improved higher employment guaranteed employees reoriented to new jobs and adaptability

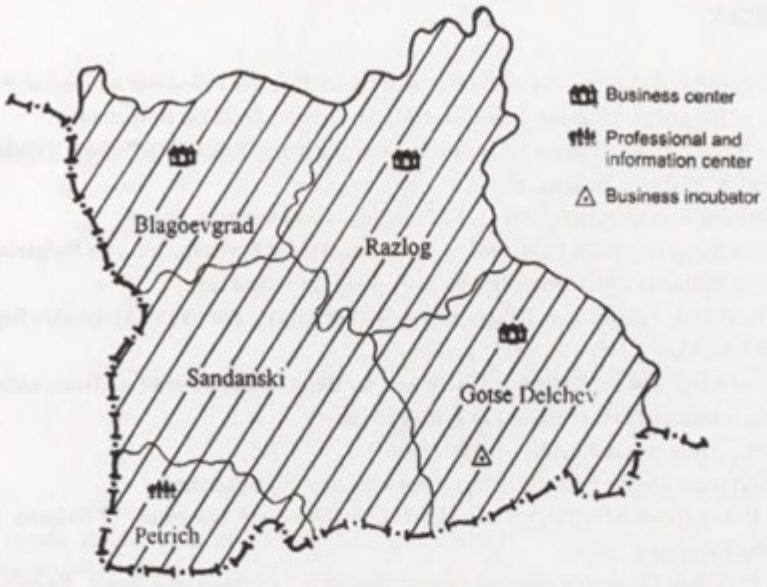

Figure 6. Centres for consultation and support of the local labour markets (2003)

facilitated. It is worth mentioning the National Program on 'Computer Training of Young People', the 'Program for Employment and Encouragement of Youth's Entrepreneurship', the 'Bulgarian-German Centre for Professional Training', etc. These training programs aim to provide jobs both for young people who have completed their school education, and for unemployed persons, as well as to promote independent economic activities.

A very important function performed by the Labour Offices in Blagoevgrad district is their intermediary activity. Owing to the latter, as well as to the Programs for Temporary Employment, the number of unemployed persons who have found jobs is increasing steadily. Alongside the intermediary activity, 23 individual consultations about job applications (esp. about the filling in of application forms, behaviour modelling, professional orientation, etc.) have been held.

Passive measures involve activities guaranteeing social protection of unemployed persons. In 2003, the sums paid from the 'Professional Qualification and Unemployment' fund in the form of relief funds, unemployment compensations, expenditures on the publishing of registration materials, etc., were greater than those in 2002. Throughout the surveyed period, the expenditure structure of the 'Professional Qualification and Unemployment' fund has been dominated by expenses needed to implement the passive measures.

In recent years the economic growth and active district and municipal policy aimed at creating new jobs have stimulated the existing trend towards a decline in unemployment.

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REGIONAL DISTINCTIONS IN THE AUTOMOBILIZATION PROCESS IN RUSSIA

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Key words: Russia, level of motorization (automobilization), individual passenger cars, the 'perestroika' period

INTRODUCTION

The level of motorization (automobilzation) measuring by the number of individual passenger cars per 1000 inhabitants is the most sensitive indicator of the wealth of local and regional population. This level was near zero in Soviet times. The car's owner at that time was very wealthy, but now it is usual case. 13% of Russian population has own cars and 25% will have it in next 7–8 years. But this motorization level is not the final point. The U.S.A. population has 775 cars per 1000 inhabitants. Many European and Asian nations (Table 1) have very high level of motorization too.

The motorization level has big dispersion: from leaders (U.S.A., Luxembourg, Italy, Germany, Australia, Malta, Austria, Iceland, Canada, France, Belgium, Sweden) to 'paupers' (countries of Africa, Asia, Latin America), which have very low level. Russia and most CIS countries take the middle position between both poles.

REGIONAL DIFFERENCES IN RUSSIA

Motorization level is varying inside Russia by regions: from maximal one (200–250 cars per 1000 inhabitants) to minimal (9–27). What are regional distinctions and what causes of such big differences? Which regions are wealthier and which are poorer, who are leaders and who are outsiders? We try to answer to these questions in this article. The available statistics of motorization's level is presented in Table 2. It contains the dates for the last 30 years. We put all regions in order of decreasing motorization level for 1970, 1985, 1993, 1997, 2000.

Table 1. The motorization level of population of the some countries (number of private passenger cars per 1000 inhabitants)

Countries	The level of motorization	Year
U.S.A.	774.7	1998
Luxembourg	567.9	1998
Italy	524.1	1995
Germany	507.8	1998
Australia	498.6	1997
Malta	490.1	1997
Austria	481.6	1998
New Zealand	470.1	1998
Switzerland	461.0	1996
Iceland	460.9	1996
Canada	449.5	1997
France	442.4	1997
Belgium	440.6	1998
Sweden	428.5	1998
Slovenia	409.6	1998
Portugal	408.3	1996
Norway	405.3	1998
Finland	393.2	1998
Spain	389	1997
Japan	386.9	1997
U.K.	377.1	1995
Netherlands	372.4	1997
Czech Republic	358	1998
Denmark	343.9	1998
Saudi Arabia	324.9	1996
Ireland	313.0	1997
Estonia	310	1998
Bahrain	238.5	1997
Lithuania	238	1997
Greece	237.6	1997
Israel	222.4	1998
Slovakia	222.2	1998
Croatia	222.1	1998
Poland	220.5	1997

Hungary	218.5	1998
Bulgaria	217.8	1998
Latvia	195.1	1998
South Korea	165.0	1998
UAE	145.6	1996
Russia	132.4	2000
Macedonia (FYROM)	132.0	1997
Argentina	130.8	1995
Belarus'	125.2	1998
Romania	125.1	1998
South Africa	101.2	1995
Ukraine	101.1	1998
Mexico	93.6	1997
Georgia	85.9	1993
Chile	84.6	1998
Venezuela	80.0	1995
Malaysia	77.7	1998
Brazil	64.5	1995
Turkey	60.2	1998
Kazakhstan	57.8	1997
Moldova	46.9	1997
Dominican Republic	45.4	1997
Tunisia	44.0	1996
Kyrgyzstan	40.0	1998
Azerbayjan	36.9	1998
Thailand	34.6	1996
Egypt	23.1	1997
Columbia	21.7	1995
Iran	13.6	1995
China	4.7	1997

The motorization level in Soviet times reflected the spatial structure of the wealth of the society of those time. So, there were 4 types of regions which had its maximal level in 1970: 1) the capital cities with the high share of officials, political and cultural Soviet elite in population (Moscow, Leningrad, Moscow region; 10–14 cars per 1000 inhabitants); 2) main industrial areas, where the industry workers had got the cars by centralized lists distributed from Moscow (Chelyabinsk, Kemerovo, Sverdlovsk regions; 6–8 cars); 3) areas with rich peasants (kolkhozniki): Rostov, Krasnodar, Saratov, Stavropol', Samara regions with 6–9 cars per 1000); 4) Caucasian areas, which always were the richest in Soviet times, than in another areas (6–7 cars per 1000). The rest of regions had this level

lower than middle one (5,5). The regions of Siberia, Far East, Far North had the middle level of motorization, because its population was richer than in another areas. The lowest ranks (less than 4 cars per 1000 inhabitants) took the 'paupers' of that time—Kursk, Kareliya, Tambov, Dagestan, Altay, Kostroma, Vologda, Hanty-Mansiyskiy district, Bryansk, Arkhangel'sk, Chuvashiya.

The mean motorization level of Russia increased from 5,5 in 1970 to 44,5 in 1985, i.e. 9 times. The former leaders (Moscow and Leningrad cities, Moscow region and Chelyabinsk region) made way for the rich areas of North Caucasus, Volga region and Southern Siberia (they had 56–66 cars per 1000 inhabitants in 1985). But Baltic republics (Estonia—109, Lithuania—92, Latvia—79) and Georgia (71) had the highest level at that time. Moscow city took only 18th rank (1st in 1970), Moscow region—33rd (4th in 1970), Leningrad city—44th. Adygeya (66), Karachaevo-Cherkessiya (66), Kabardino-Balkariya (66), Kurgan region (65), Stavropol' region (64), Hakasiya (62), Krasnodar region (61), Orenburg region (61), Rostov region (60), Volgograd region (58) became the leaders in 1985. Many regions of Siberia, Far East, the Urals took middle position (near 44), and the most of regions of Central and Chernozyom areas—the low part of the ranking 'tail'. Regions of European North, Chuvashiya and Chukotka (6,3) regions were the poorest ones as usually.

The 'perestroika' period meant the start of population enrichment: the average motorization level increased from 44,5 in 1985 to 58,6 in 1990, 75,7 in 1993 and 93,3 in 1995. The big flow of cheap second-hand cars from European and Asian countries (mostly from Germany and Japan) in the beginning of the 1990s has increased the motorization level in the regions located near state borders (Kaliningrad, Primorskiy, Sakhalin, Kareliya) and in the centres with the highest income of population (Moscow and St.-Petersburg cities, Samara and Tyumen' regions). It has jumped in Moscow city from 50,3 in 1985 to 70,6 in 1990, 93,6 in 1992, 113,1 in 1993, 138,3 in 1994, 153,5 in 1995 (so, in 3 times). The former southern leaders were replaced step-by-step by new leaders of 'early capitalism'. So, old Soviet leaders (Adygeya, Kurgan, Hakasiya, Krasnodar, Orenburg, Rostov, Kabardino-Balkariya, Volgograd regions) remained as leaders in 1993, but gave up their first positions for new leaders till 1997 (Sakhalin, Kaliningrad, Kamchatka, Murmansk, Irkutsk, Primorskiy, Kareliya regions, Moscow and St.-Petersburg cities). Up to 1997 the first position was taken by Sakhalin, 2nd—Kaliningrad region, Moscow city—3rd, Primorskiy kray—4th, Hanty-Mansiyskiy district—5th, Tyumen' region—6th, St.-Petersburg city—7th, Habarovsk region—8th, Samara region—9th. Only two old leaders didn't loose their positions (Krasnodar region and Adygeya with 10th and 12th ranks), but another 'former' leaders moved to the middle or tail ranks.

Financial crisis of August 1998 temporarily stopped the growth of motorization, but only for a short time. The brand new and luxury cars from abroad have became the most popular after this event. The motorization boom accelerated in 1999–2000, and the ranking of regions changed finally (Table 2, Figure 1, 2). As to 2000, Moscow and St.-Petersburg cities became the leaders again as originally in 1970. The first 20 ranks took the new rich regions, which 1) used its profitable geographic location at the borders (Kaliningrad, Primorskiy, Sakhalin, Kamchatka, Kareliya, Leningrad, Magadan, Murmansk, Belgorod, Amur regions); 2) are the wealthiest because of gas and oil deposits (Hanty-Mansiyskiy

Figure 1. Level of motorization in Russia, 2002

Table 2. The motorization level of population of Russian regions in 1970–2000 (number of private passenger cars per 1000 inhabitants). The regions are ordered by the decreasing of this level in 2000. The ranks of regions were determined for each year by decreasing of the level of motorization (from maximal to minimal scores)

Region	Motorization of population (number of private cars per 1000 inhabitants)					Growth in 1993–2000		Ranks of regions by their motorization level					Changes of ranks in	
	1970	1985	1993	1997	2000	Absolute increase	B %%	1970	1985	1993	1997	2000	1985–2000	1993–2000
Moscow city	14.3	53.0	113.1	188.8	223.8	+110.7	+97.9%	1	18	2	3	1	+17	+1
Kaliningrad	5.8	40.2	106.1	205.2	208.0	+101.9	+96.0%	16	47	4	2	2	+45	+2
Primorksiy kray	5.1	44.0	95.7	181.4	202.1	+106.4	+111.2%	26	36	8	4	3	+33	+5
Hanty-Mansiyskiy district	2.1	37.6	87.4	180.1	198.9	+111.5	+127.6%	72	55	21	5	4	+51	+17
St.-Petersburg (city)	10.4	40.9	90.9	147.9	183.7	+92.8	+102.1%	2	45	15	7	5	+40	+10
Sakhalin	5.5	49.2	134.7	206.9	183.0	+48.3	+35.9%	20	26	1	1	6	+20	-5
Tyumen	3.5	43.1	85.5	150.7	170.4	+84.9	+99.3%	43	39	26	6	7	+32	+19
Krasnodar	7.6	60.8	93.7	140.9	166.7	+73.0	+77.9%	6	7	11	10	8	-1	+3
Kamchatka	4.4	45.1	105.9	140.1	165.7	+59.8	+56.5%	34	31	5	11	9	+22	-4
Samara	6.8	49.7	84.3	147.2	163.0	+78.7	+93.3%	10	25	28	9	10	+15	+18
Adygeya	4.2	66.4	111.3	135.4	154.4	+43.1	+38.7%	35	1	3	12	11	-10	-8
Kareliya	2.5	39.2	89.2	130.0	148.7	+59.5	+66.7%	66	52	20	15	12	+40	+8
Moscow region	8.6	44.3	81.3	131.5	148.5	+67.2	+82.7%	4	34	32	13	13	+21	+19
Hakasiya	...	62.1	97.2	121.9	148.0	+50.8	+52.3%	...	6	7	21	14	-8	-7
Yamalo-Nenetskiy district	1.4	10.9	59.2	126.5	147.9	+88.7	+149.8%	78	84	59	19	15	+69	+44
Rostov	9.2	59.6	89.8	127.1	141.6	+51.8	+57.7%	3	9	18	18	16	-7	+2
Stavropol'	6.8	63.9	81.9	122.5	140.3	+58.4	+71.3%	9	5	31	20	17	-12	+14

Leningrad	4.5	32.2	59.8	96.5	139.8	+80.0	+133.8%	32	65	57	44	18	+47	+39
Belgorod	3.5	44.0	89.8	112.8	137.3	+47.5	+52.9%	42	35	19	26	19	+16	0
Magadan	3.2	31.1	85.8	113.7	136.7	+50.9	+59.3%	51	67	24	24	20	+47	+4
Amur	3.3	42.2	85.1	130.5	134.7	+49.6	+58.3%	48	42	27	14	21	+21	+6
Murmansk	5.1	53.9	91.7	112.4	134.2	+42.5	+46.5%	25	16	12	27	22	-6	-10
Irkutsk	5.1	56.6	90.6	128.4	133.4	+42.8	+47.2%	24	15	16	16	23	-8	-7
Orenburg	5.3	60.8	91.1	117.6	132.6	+41.5	+45.6%	23	8	14	22	24	-16	-10
RUSSIA	5.5	44.5	75.7	113.7	132.4	+56.7	+74.9%	—	—	—	—	—	—	—
Lipetsk	3.4	38.5	60.3	97.1	131.6	+71.3	+118.2%	44	54	56	40	25	+29	+31
Habarovsk	3.2	32.8	72.1	147.5	130.0	+57.9	+80.3%	50	64	41	8	26	+38	+15
Chelyabinsk	8.2	52.1	82.9	107.2	126.0	+43.1	+52.0%	5	20	29	33	27	-7	+2
Omsk	4.6	44.7	69.2	103.1	125.3	+56.1	+81.1%	30	32	45	36	28	+4	+17
Altayskiy kray	3.2	56.9	82.9	110.4	125.1	+42.2	+50.9%	49	13	30	30	29	-16	+1
Bashkiriya	3.8	44.4	70.9	108.0	124.6	+53.7	+75.7%	40	33	43	32	30	+3	+13
Tomsk	4.0	48.6	93.8	98.7	124.2	+30.4	+32.4%	38	28	10	39	31	-3	-21
Saratov	7.5	53.6	85.6	110.2	123.3	+37.7	+44.0%	8	17	25	31	32	-15	-7
Tambov	2.5	34.5	61.4	94.1	122.7	+61.3	+99.8%	67	59	54	50	33	+26	+21
Volgograd	6.0	58.3	86.4	104.2	122.4	+36.0	+41.7%	14	11	23	34	34	-23	-9
Pskov	3.1	42.0	71.0	104.1	119.3	+48.3	+68.0%	53	43	42	35	35	+8	+7
Tula	4.7	39.7	65.0	94.2	116.1	+51.1	+78.6%	27	49	52	49	36	+13	+16
Kemerovo	6.7	50.2	74.6	101.1	114.8	+40.2	+53.9%	11	24	37	37	37	-13	0

Table 2 *cont.*

Ul'yanovsk	3.4	39.5	65.0	94.2	114.8	+49.8	+76.6%	46	50	53	48	38	+12	+15
Kaluga	4.7	42.4	67.0	94.6	114.0	+47.0	+70.1%	28	41	47	47	39	+2	+8
Tver'	3.0	33.0	61.0	83.7	113.6	+52.6	+86.2%	58	62	55	61	40	+22	+15
Kurgan	5.8	65.4	98.3	114.9	113.4	+15.2	+15.5%	17	4	6	23	41	-37	-35
Northern Osetiya	6.5	56.8	72.6	99.9	113.4	+40.8	+56.2%	13	14	40	38	42	-28	-2
Jewish district	...	27.7	48.9	90.2	113.2	+64.3	+131.5%	-	75	72	52	43	+32	+29
Vologda	2.1	26.9	49.9	89.4	113.1	+63.2	+126.7%	71	78	71	54	44	+34	+27
Oryol	3.0	38.6	65.5	94.7	112.7	+47.2	+72.1%	57	53	51	45	45	+8	+6
Krasnoyarsk	4.7	49.0	93.9	112.1	111.9	+18.0	+19.2%	29	27	9	28	46	-19	-37
Ryazan'	3.4	35.2	58.2	88.1	111.7	+53.5	+91.9%	45	57	61	57	47	+10	+14
Udmurtiya	5.4	43.8	66.4	87.1	109.7	+43.3	+65.2%	21	38	50	59	48	-10	+2
Yakutiya	4.5	43.9	79.1	113.3	108.5	+29.4	+37.2%	31	37	33	25	49	-12	-16
Tatarstan	2.8	31.1	54.4	97.1	108.2	+53.8	+98.9%	64	68	65	41	50	+18	+15
Chita	3.0	51.4	70.1	110.9	108.1	+38.0	+54.2%	59	21	44	29	51	-30	-7
Kursk	2.6	23.7	36.6	78.7	107.6	+71.0	+194.0%	65	80	79	69	52	+28	+27
Kabardino-Balkariya	7.6	65.9	87.0	94.6	106.9	+19.9	+22.9%	7	3	22	46	53	-50	-31
Voronezh	5.3	50.8	90.1	127.7	105.8	+15.7	+17.4%	22	32	17	17	54	-32	-37
Nizhniy Novgorod	4.1	33.6	53.7	80.0	105.0	+51.3	+95.5%	37	61	66	68	55	+6	+11
Kalmykiya	3.3	50.8	77.2	97.1	104.9	+27,7	+35.9%	47	23	35	41	56	-33	-21
Altay	2.2	39.3	75.0	86.6	103.8	+28.8	+38.4%	69	51	36	60	57	-6	-21

Perm'	2.9	29.3	47.5	67.8	102.8	+55.3	+116.4%	62	71	75	75	58	+13	+17
Vladimir	3.1	34.8	56.4	82.8	102.5	+46.1	+81.7%	54	58	64	62	59	-1	+5
Komi	3.1	40.2	58.0	96.9	102.4	+44.4	+76.6%	56	48	62	43	60	-12	+2
Penza	2.9	34.5	57.0	80.7	101.2	+44.2	+77.5%	60	60	63	64	61	-1	+2
Novgorod	3.8	32.9	48.7	81.4	100.5	+51.8	+106.4%	39	63	73	63	62	+1	+11
Smolensk	3.1	40.8	66.5	87.6	99.9	+33.4	+50.2%	55	46	49	58	63	-17	-14
Yaroslavl'	3.2	32.1	52.5	80.1	98.1	+45.6	+86.9%	52	66	68	66	64	+2	+4
Sverdlovsk	6.6	41.3	66.7	89.4	97.2	+30.5	+45.7%	12	45	48	53	65	-20	-17
Novosibirsk	5.6	52.3	73.3	88.6	96.2	+22.9	+31.2%	19	19	38	56	66	-47	-28
Astrakhan	2.9	31.1	59.0	77.4	95.9	+36.9	+62.5%	61	69	60	70	67	+2	-7
Ivanovo	3.8	29.2	44.9	88.7	95.4	+50.5	+112.5%	39	72	76	55	68	+4	+8
Kostroma	2.1	31.0	59.6	72.1	95.3	+35.7	+59.9%	70	70	58	72	69	+1	-11
Karachaevo-Cherkesiya	...	66.0	91.7	80.1	95.0	+3.3	+3.6%	—	2	13	67	70	-68	-57
Tuva	4.4	47.0	52.1	60.7	90.4	+38.3	+73.5%	33	29	69	78	71	-42	-2
Aginskiy district	5.8	57.8	79.0	92.0	89.4	+10.4	+13.2%	18	12	34	51	72	-60	-38
Arkhangel'sk	1.7	27.2	51.5	71.4	85.7	+34.2	+66.4%	75	77	70	73	73	+4	-3
Kirov	2.8	35.6	52.9	69.2	83.6	+30.7	+58.0%	63	56	67	74	74	-18	-7
Mordoviya	1.7	28.2	47.9	65.9	78.6	+30.7	+64.1%	76	74	74	76	75	+1	-1
Buryatiya	4.1	45.2	72.6	75.1	76.2	+3.6	+5.0%	36	30	39	71	76	-46	-37
Mariy El	1.8	28.7	43.5	61.9	75.4	+31.9	+73.3%	73	73	77	77	77	-4	0
Ust'-Ordynskiy district	...	59.4	67.6	80.6	69.7	+2.1	+3.1%	—	10	46	65	78	-68	-32

Table 2 *cont.*

Chuvashiya	1.6	19.4	33.8	51.7	64.3	+30.5	+90.2%	77	81	82	79	79	+2	+3
Bryansk	1.7	24.3	34.6	45.6	57.6	+23.0	+66.5%	74	79	80	81	80	-1	0
Checheno-Ingushetiya /since 1997—Ingushetiya	5.9	42.5	...	38.8	54.8	...	...	15	40	—	83	81	-41	—
Nenetskiy district	0.8	17.0	34.2	42.3	54.0	+19.8	+57.9%	80	83	81	82	82	+1	-1
Dagestan	2.3	27.5	38.6	45.7	53.5	+14.9	+38.6%	68	76	78	80	83	-7	-3
Taymyrskiy district	0.4	10.4	17.2	25.0	40.9	+23.7	+137.8%	81	85	84	84	84	+1	0
Komi-Permyatskiy district	1.0	18.9	23.0	19.4	27.2	+4.2	+18.3%	79	82	83	85	85	-3	-2
Koryakskiy district	0.1	...	8.3	...	16.6	+8.3	+100.0%	82	—	87	—	86	—	+1
Chukotskiy district	...	6.3	9.5	14.1	15.1	+5.6	+58.9%	—	87	86	86	87	0	-1
Evenkiyskiy district	...	10.4	12.0	8.3	9.4	-2.6	-21.7%	—	86	85	87	88	-2	-2

and Yamalo-Nenetskiy districts, Orenburg region); 3) the wealthiest centres of the country (Moscow, Krasnodar, Samara, Rostov, Stavropol' regions). The middle ranks take the southern regions of Volga and Siberia, Chernozyom area; the low part—rest regions of the Central area, European North, Caucasian outsiders; the 'tail'—permanent outsiders (Arhangel'sk and Kirov regions, Mordoviya, Mariy El, Chuvashiya, Bryansk region, Dagestan), autonomous regions of Far North and new outsiders (Tuva, Buryatiya, Chechenia, Ingushetiya). Some old outsiders (Kursk, Vologda, Tambov, Perm', Pskov regions) improved its ranks.

REGIONAL CLASSIFICATIONS

We studied the dynamics of rank changes of each region and found out 17 types of such changes during last 30 years. We divided all regions into three big groups—leaders, middle-class, outsiders. These 17 types of dynamics of motorization process are as follows:

1. Regions-leaders, who give up their former high ranks step-by-step (Krasnodar, Hakasiya, Rostov regions). Their keep the positions inside the first 20 ranks, but are leaving this class.

2. Former leaders, who lost their positions, but returned back to leaders again (Moscow and St.-Petersburg cities; Kaliningrad, Moscow and Samara regions).

3. Regions, making no headway at the top of hierarchy with drastic movements inside leaders group (Irkutsk, Stavropol' regions).

4. Former leaders moved to the middle positions (so called impoverished 'industrial workers and peasants': Saratov, Kemerovo, Kurgan, Volgograd, Chelyabinsk, Kaluga regions; Udmurtiya, Northern Osetiya).

5. Former leaders transforming into outsiders (Sverdlovsk, Novosibirsk, Voronezh regions; Ust'-Ordynskiy and Aginskiy districts, Karachaevo-Cherkessiya, Kabardino-Balkariya, Chechenia, Ingushetiya).

6. Former middle-position regions transforming into leaders (Primorskiy, Sakhalin, Belgorod, Kamchatka, Amur regions).

7. Former outsiders transforming into new leaders (Hanty-Mansiyskiy and Yamalo-Nenetskiy districts, Kareliya, Tyumen' regions).

8. Middle-position regions, which became leaders, but returning slowly back to middle-class (Adygeya, Orenburg, Magadan regions).

9. Middle-class regions, who have visited class of leaders, but returned back soon to middle-class (Tomsk, Altay, Krasnoyarsk, Kalmykiya).

10. Middle-class regions, who transformed into outsider, but then—into leaders (Habarovsk, Lipetsk, Leinigrad regions).

11. Middle-class regions made no headway (Yakutiya, Bashkiriya, Omsk, Ul'yanovsk, Perm', Tver', Vladimir, Ryazan', Tula, Oryol regions).

12. Middle-class regions, who became outsiders, but then returned back to middle-class (Nizhniy Novgorod region).

13. Middle-class regions transformed into outsiders (Tuva, Buryatiya, Komi, Yaroslavl', Ivanovo, Smolensk, Novgorod regions).

14. Outsiders who became middle-class members (Tambov, Vologda, Perm', Pskov, Kursk regions; Jewish district).

15. Outsiders who transformed into middle-class regions, but then returned back to outsiders (Tatarstan, Altay republic, Kirov and Chita regions).

16. Permanent outsiders (Penza region).

17. Permanent 'tail marginal' outsiders (Mordoviya, Arkhangel'sk, Kostroma, Astrakhan, Bryansk, Chuvashiya, Mariy El, Dagestan; autonomous districts of Far North—Nenetskiy, Komi-Permyatskiy, Taimyrskiy, Evenkiyskiy, Chukotskiy, Koryakskiy).

Table 3 demonstrates the mobility of regions between classes of hierarchy (determined by ranks of motorization level) in 1985–2000. 33 regions of 88 didn't change its position, 55 (62%) changed its original class and moved into another. 26 of latter reduced its status and 29 raised. So, the level of rank stability in 1985–2000 was 0,38, negative mobility—0,30 and positive mobility of regions—0,33. The changes of ranks of each region in 1970–2000 are indicated in the two most right columns of Table 2. The maximal shift from 'bottom' to 'top' of region ranks was made in 1985–2000 by Yamalo-Nenetskiy district (its rank increased by +69 points), Hanty-Mansiyskiy district (+51), Leningrad region (+47), Magadan region (+47), Kaliningrad region (+45), city St.-Petersburg (+40), Kareliya (+40), Habarovsk region (+38), Vologda region (+34), Primorskiy region (+33), Tyumen region (+32), Jewish district (+32), Lipetsk region (+29), Kursk region (+28). Next regions have moved from top to bottom level: Ust'-Ordynskiy district (its rank fell down by—68 points), Karachaevo-Cherkessiya (-68), Aginskiy district (-60), Kabardino-Balkariya (-50), Novosibirsk region (-47), Buryatiya (-46), Tuva (-42), Checheno-Ingushetiya (-41), Kurgan region (-37), Kalmykiya (-33), Voronezh region (-32), Chita region (-30), Northern Osetiya (-28). The rank almost didn't change (from + 4 points to—4points) for Arkhangel'sk region (+4), Omsk region (+4), Bashkiriya (+3); Ivanovo, Kaluga, Yaroslavl', Astrakhan regions and Chuvashiya (+2); Kostroma, Novgorod, Mordoviya, Nenetskiy and Taimyrskiy districts (+1); Chukotskiy district (0);

Table 3. The change of the hierarchy level (rank) of motorization of population (the number of private passenger cars per 1000 inhabitants) in Russian regions in 1985–2000. The number of regions, which moved from one class of hierarchy to another (arrow shows this change), is indicated; the number of regions who didn't change its position in the class is indicated by bold characters

Hierarchy classes (region groups with its ranks)	Highest (1–17)	High (18–34)	Middle (35–51)	Low (52–68)	Lowest (69–88)	Totally
Highest (1–17)	5	→6	→2	→1	→3	17
High (18–34)	→5	4	→3	→3	→2	17
Middle (35–51)	→4	→2	6	→4	→1	17
Low (52–68)	→2	→5	→4	5	→1	17
Lowest (69–88)	→1	—	→2	→4	13	20
Totally	17	17	17	17	20	88

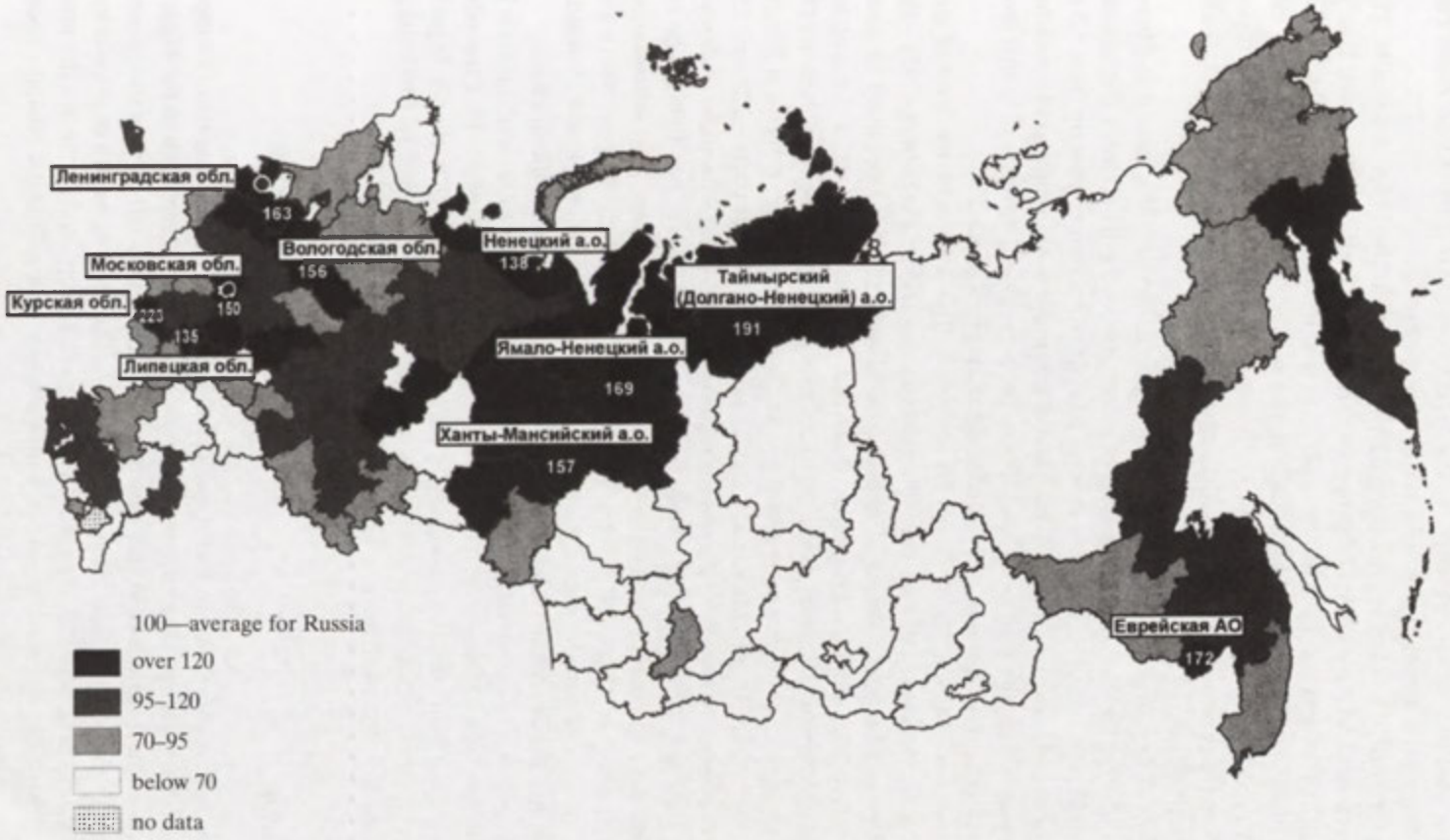

Figure 2. Increase of the number of cars in Russia, 1993–2002.

Krasnodar, Vladimir, Penza, Bryansk regions (-1); Evenkiyskiy district (-2); Komi-Permyatskiy district and Tomsk region (-3), Mariy El (-4 points).

The motorization level of regional population grew up in the 1990s drastically. The following regions had the highest absolute growth of this indicator in 1993–2000: Hanty-Mansiyskiy district (+111,5 private passenger cars per 1000 inhabitants), Moscow city (+110,7), Primorskiy region (+106,4), Kaliningrad region (+101,9), St.-Petersburg city (+92,8), Yamalo-Nenetskiy district (+88,7), Tyumen region (+84,9), Leningrad region (+80,0), Samara region (+78,7), Krasnodar region (+73,0), Lipetsk region (+71,3) and Kursk region (+71,0).

The shift of the social-economic conditions in Russia in the 1990s caused by liberal revolution of 1991 has changed 1) the level of motorization, 2) the regional distinctions between different parts of Russia. The average level of motorization grew up from 5,5 in 1970 to 75,7 in 1993 and 147,7 in 2002. The race of this process was unique, but nevertheless it remains behind the European level. There are big regional differences in this level between western and eastern, northern and southern regions of Russia.

The newest statistics for 2002 shows the following. The leaders by the level of motorization take Moscow (256 cars per 1000 inhabitants) and St.-Petersburg (195)—the wealthiest poles of modern Russia. The highest positions were also occupied by some border regions (Kaliningrad, Primorskiy, Sakhalin, Kamchatka, Karelia, Leningrad, Magadan and Murmansk regions; from 150 to 221 cars per 1000). Also the richest are the regions with high level of general regional product—northern areas of Western Siberia (oil-gas owners, like Khanty-Mansiyskiy and Yamalo-Nenetskiy districts—225 and 159 cars per 1000 respectively), richest agrarian regions in the South (Krasnodar, Adygeya, Samara, Stavropol', Belgorod and Orenburg regions; 160–180 cars per 1000). The regions, which have the middle level of motorization (120–150 cars per 1000 inhabitants), are southern areas of Volga and Siberia, some regions of European Center, North and Caucasus. Some old outsiders have got higher positions than before (Kursk, Vologda, Tambov, Perm', Pskov regions) due to the improvement of their economic situation.

The lowest level of motorization (between 50 and 120 cars per 1000 inhabtants) is in the permanent regional outsiders (Arkhangelsk, Kirov, Mordoviya, Matiy El. Chuvashiya, Bryansk, Dagestan) and new outsiders (republics Tuva, Buryatiya, Checheria, Ingushetiya). The northern autonomous districts (Komi-Permyatskiy, Koryakskiy, Chukotskiy, Evenkiyskiy) have the minimal level (9–35 cars per 1000 inhabitants).

CONCLUSION

The automobilization process in Russia has fast velocity, but it is delaying from Europe, Asia and North America. There are big differences in its level: from high in the biggest cities and wealthiest regions (150–220 cars per 1000) to minimal (10 cars) in the poorest and the most remote from European part of Russia. The level of wealth of population, big deposits of fuel, geographical proximity to Western Europe and Japan are the main causes of these differences. All regions are divided into leaders, 'middle-position' members and outsiders.

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