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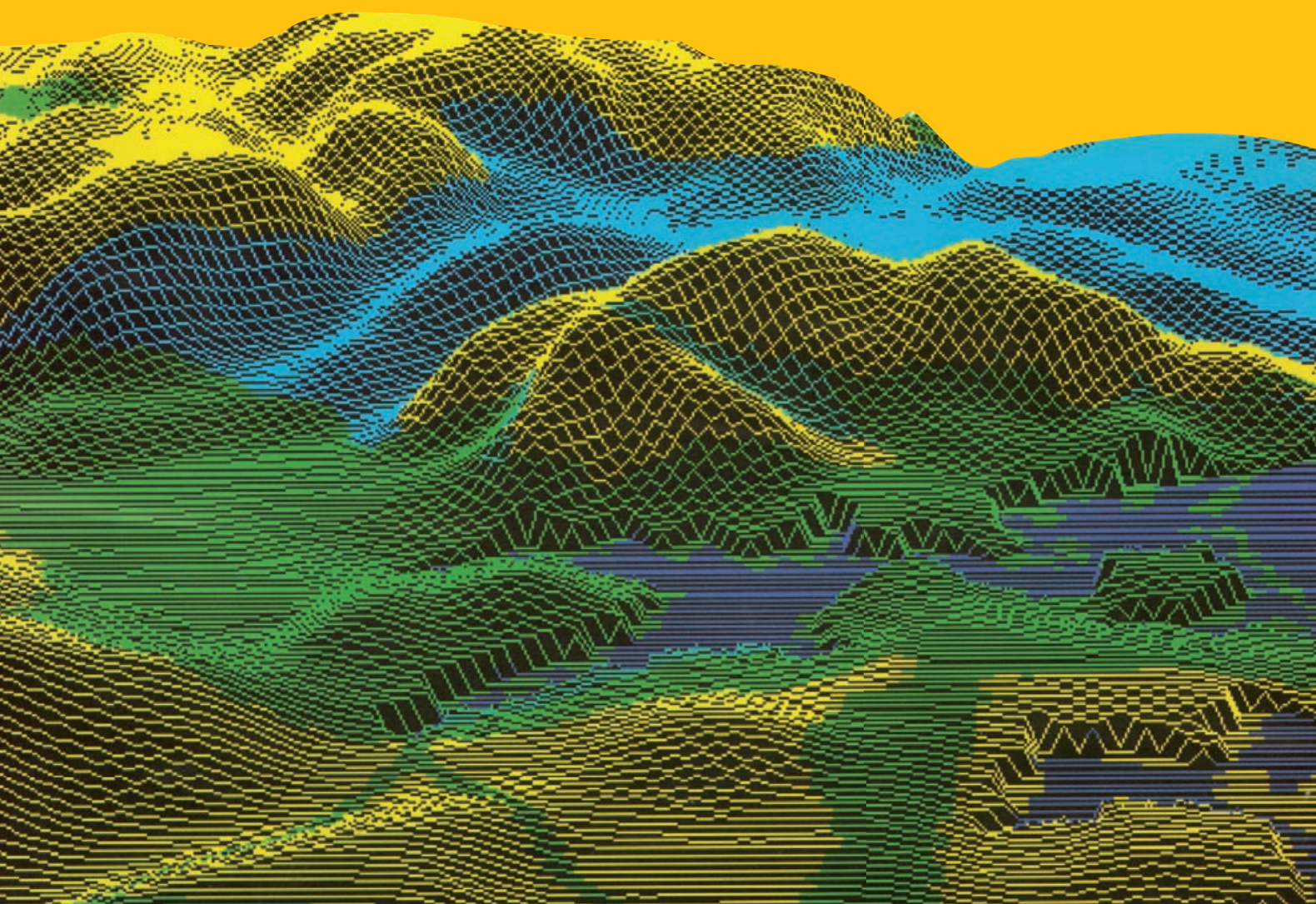




Fig. 2: Orlické hory Mts. with the massif of the Králický Sněžník / Snieżnik

(Photo M. Hrádek)



Fig. 7: Cottage of the typical local architecture (village Mladkov, CR)

(Photo A. Vaishar)

Illustrations related to the paper by A. Vaishar et al.

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(25 let Ústavu geoniky Akademie věd České republiky)

THE ROLE OF FOREIGN DIRECT INVESTMENTS IN HUNGARY'S REGIONAL DEVELOPMENT

Györgyi BARTA, György KUKELY

Abstract

With privatization having come to end, Hungary enters a new stage of foreign direct investment. Hungary's competitive advantages and its attractiveness for foreign investment relative to neighbouring countries have diminished.

As to individual regions, foreign direct investments (FDI) appear in Hungary in an extremely concentrated form, 80-85% being located in Budapest, in the capital's agglomeration and in the region of Northern Transdanubia. This region has become part of what we can call a new Central and Eastern European growth pole or dynamic area. The volume of investments has been much smaller in other parts of the country. No significant changes have been recorded in the spatial structure of investments. Investors could be observed to give preference to expanding existing companies by means of new investments or to increasing their capitalization as opposed to greenfield investments. For this reason, substantial modifications in the regional pattern of FDI location can hardly be expected in the foreseeable future.

Regional development policies have sought to encourage investments in disadvantaged areas by improving the infrastructural environment (primarily by means of constructing motorways and industrial parks) as well as other incentives. At the same time, it is difficult to strike the right balance between the requirements of efficiency and solidarity. The task of improving the relative positions of backward regions has certainly slowed down the overall growth of national economy.

Shrnutí

Vliv přímých zahraničních investic pro maďarský regionální rozvoj

S ukončením privatizace vstupuje Maďarsko do nové fáze přímých zahraničních investic. Konkurenční výhody Maďarska a jeho atraktivita pro zahraniční investice se ve vztahu k sousedním zemím snížily.

Pokud jde o jednotlivé oblasti, přímé zahraniční investice se v Maďarsku objevují v mimořádně koncentrované formě – 80-85 % jich je umístováno v Budapešti, v aglomeraci hlavního města a v regionu severního Podunají. Tento region se stal součástí něčeho, co můžeme nazývat novým středo- a východoevropskými póly růstu či dynamickou oblastí růstu. V ostatních částech země je objem investic mnohem nižší. Na rozdíl od investic na zelené louce upřednostňují investoři využití nových investic pro další rozvoj stávajících firem anebo pro zvyšování jejich kapitalizace.

Z těchto důvodů se dají podstatné změny v regionálním modelu distribuce přímých zahraničních investic v dohledné budoucnosti očekávat jen stěží.

Regionální rozvojové strategie hledají cestu pro povzbuzení investic ve znevýhodněných oblastech zlepšováním jejich infrastruktury (zejména prostřednictvím výstavby dálnic a průmyslových parků) i dalšími pobídkami. Současně je těžké postihnout správnou vyváženost mezi potřebami efektivnosti a solidarity. Úkol zaměřený na zlepšení relativního postavení zaostalých regionů zcela jistě zpomalil celkový růst národní ekonomiky.

Key words: *foreign direct investment, regional development, regional policy, location, cluster, growth pole, Hungary.*

1. Introduction

As a consequence of the system change, Eastern and Central European countries experienced a political and economic crisis which in many cases was further exacerbated by economic debt. A high-level of capital injection was required to stabilize the economies of ex-Communist countries and to reduce their technological

backwardness. Capitalization in turn necessitated the large-scale privatization of state property. Since significant amounts of wealth could not be accumulated under the state-planned economy, one key solution was the involvement of foreign direct investment (FDI) (Atzinger, Bellak, 1999; Blažek, 2003; Brento, di Mauro, Lücke, 1999; Carter, 2000; Domański, 2003; Hunya, 1999;

Pavlínek, 1998, 2004; Smith, Ferenciková, 1998; Smith, Pavlínek, 2001; Tondl, Vuksic, 2003). The competitiveness of these countries still depends significantly on their FDI-attracting potential. One crucial indicator of their success is the amount of FDI arriving there.

Conditions for attracting FDI have changed considerably during the last fifteen years after the system change. The dividing line can be drawn at around 2001 or 2002, although the relevant processes have not coincided exactly in different countries of Central and Eastern Europe (which discrepancy is mainly due to the different timing of privatization). In the 1990s privatization was chiefly motivated by the search for new markets and available cheap labour. After 2000 the location (and share) of FDI developed less favourably. This was mainly to be attributed to global economic recession. However, the situation has also changed in the countries of Central and Eastern Europe relative to ten years earlier. The supply of cheap and comparably qualified labour was exhausted, while infrastructural services requiring minimal investments were already exploited. As a result, new FDI-attracting factors have become more important such as advantages to be gained from economic clustering, externalities generated by cooperation among the already operating companies, new economic policy measures encouraging the location of FDI, prospects and new realities of EU membership, etc. (Antalóczy, Sass, 2002; Dicken, 2000; Kalotay, 2003; Szalavetz, 2003; UNCTAD, 2004).

Foreign companies, especially multinational firms, played a central role in bringing about the economy's structural transformation (Guerreri, 1998; Carter, 2000; Hunya, 2002; Szanyi, 1999). They imported new professional and management know-how, increased productivity, improved technological standards. At the same time, they contributed significantly to the emergence of the so-called 'dual' economy (Barta, 2002; Domański, 2003). That is to say, a large gap appeared in terms of technological standards, capitalization and even profitability with companies in foreign ownership and their subcontractors on the one side and mostly Hungarian-owned SMEs (small and medium enterprises) on the other. Moreover, duality is meant to refer not only to discrepancies but also to the existence of hindrances obstructing the interaction between these two groups of economic actors. Foreign companies are slow to strike root in the economies of host countries. They seldom rely on local R&D (research and development) capacities. Subcontractors and business partners of multinational companies tend to be again firms in foreign ownership.

FDI has contributed to transforming the economy's spatial structure. The clustering of FDI is a spontaneous development as characteristic of Western European

economies (Brühlhart, 2001) as of Central and Eastern European countries (Carter, 2000; Blažek, 2003; Domański, 2003; Pavlínek, 2004). Moreover, in some Southern European countries the concentration is even greater than in Central and Eastern Europe. Thus in Portugal 80% of total FDI is located in the region of Lisbon, while in Spain 70% of total FDI is concentrated in Madrid and Barcelona. The spatial structure of FDI and the regional level of economic development are strongly correlated. In short, FDI has become a crucial factor in shaping the economic space (Antalóczy, Sass, 2005; Kiss, 2001). FDI continues to strengthen the most developed regions (by reinvesting profit generated from greenfield and privatization investments) and can thereby significantly increase the spatial differentiation (Domański, 2003).

These main features apply to all countries of Central and Eastern Europe. At the same time one can observe differences in the development of FDI, too. Hungary, for example, differed to some extent due to a greater openness of the economy, early appearance of large-scale privatization and relatively high labour costs.

Foreign direct investments (FDI) have become an integral part of the Hungarian economy becoming a crucial factor in ownership, sectoral employment and spatial structures and driving technological innovation as well (Barta, 2002). The success of the Hungarian economy in the early 1990s and its growing output is intimately tied up with the activities of foreign companies. It is no exaggeration to claim that neither the Hungarian economy as a whole nor any of its important aspects can be today studied separately from FDI. By the mid-1990s the share of foreign companies settled around 10% of all enterprises operating in Hungary. In 2000, foreign companies owned two-thirds of total subscribed capital, realized 60% of all investments, employed one-third of working population and paid around a half of Hungarian wages. The contribution of foreign companies to Hungarian exports was particularly significant reaching 83% by the turn of the century.

Although this feature is slowly becoming less prominent, the Hungarian economy continues to be characterized by duality that reflects primarily in a marked performance gap between the large foreign companies (primarily multinationals) and the Hungarian small- and medium enterprises (SMEs). A three-fold and a four-fold difference (concerning net revenues per employee and added value per employee, respectively) was recorded between the productivity of foreign companies on the one hand and that of entirely domestically owned companies on the other (Csáki, 2000). An equally large discrepancy exists in terms of technological standards. The superiority of foreign companies in high-tech sectors of the economy has been unchallenged. Nor do

the current trends point towards a healthier balance. On the contrary, domestic enterprises were specializing to a much larger extent in labour-intensive, low-grade technological activities during the 1990s than their foreign counterparts, while their activities in sectors based on medium-high and high-tech were incrementally contributing to the increasing productivity of foreign companies (Kopint, Datorg, 2004).

No doubt, FDI is definitely advantageous for the Hungarian economy. At the same time, one may wonder whether FDI has been playing an equally positive role in the regional development? Can we say that the appearance and spread of FDI has helped to reduce regional differences within the Hungarian economy? This study takes a closer look at the spatial impact of FDI in order to answer these questions.

2. FDI location in Hungary

Foreign investors first choose a country for their company and only then do they turn to identifying a preferred region and town in that country. Most important criteria for the choice of country include geographical situation, political stability, government's economic policies, macroeconomic conditions and the level of business environment. In deciding on a town or a region, the criteria of highest weight are accessibility, character and development of local economy and local economic policies. In Hungary, the first phase of FDI ended in about 2000. The next phase set in with an initial, quite significant drop in FDI. This was primarily to be attributed to the world economy's volatility although the domestic FDI-attracting potential also changed. Privatization offering the most advantageous conditions for foreign investors had in effect ended by this time. The positions of economic players became more stable. Investment conditions changed in other respects too. Production costs significantly increased primarily due to the growth of wages initiated by the government and the administrative increase of minimum wage. In the region of Northern Transdanubia and in the Budapest agglomeration the supply of qualified, young workforce began to run short. This was a particularly worrying tendency in the period of the geographical clustering of foreign companies (i.e. when new investors seek locations in the vicinity of companies belonging to the same sector or cluster).

Starting from 2000, another important consideration began to influence location of foreign firms, namely the fact that changing attitudes towards FDI reflected in the Hungarian government's economic and regional development policies. Rather than looking for new ways of attracting foreign capital, the Orbán-cabinet (1998-2002) sought to set off the impact of economic recession and the plummeting of foreign investments by

stimulating the domestic economy and by intensifying the state demand. The socialist-liberal coalition which was to follow in 2002, announced a new strategy that stressed once again the importance of FDI. A slow increase is now already perceptible after formerly negative tendencies.

And what about the regional development? Despite all political rhetoric to the contrary, policies focusing on economic growth can conflict to some extent with the essentially balancing objectives of regional development. The incumbent government accepted an ambitious programme of regional development (NSDC 2005). It remains to be seen, however, whether or not this programme will indeed be capable of resolving this inherent contradiction.

3. Territorial distribution of foreign companies in Hungary

Indicators of territorial distribution have hardly changed since the appearance of FDI in Hungary (Tab. 1). The region of Central Hungary, particularly Budapest and its agglomeration in the Pest County, have continued to be the most attractive area for foreign investors. Nearly two-thirds of all FDI is concentrated in this region. This is hardly surprising in the light of the fact that capital cities, especially if their economy is of significant size, are most important targets for investors everywhere. The capital-attracting potential of capital cities is even stronger in Eastern Europe where country capitals are often the only large cities or metropolises (e.g. the Czech Republic, Slovakia, Slovenia, Baltic countries, etc.)

The region of Northern Transdanubia is another important area for foreign investors partly due to the proximity of Western European markets and partly due to relatively developed conditions in this region (which has the only cross-border motorway, a better qualified workforce, higher industrial standards and, last but not least, favourable attitudes towards foreign investment - Barta, 2002). Multinational car manufacturers, electronics companies and their subcontractors dominate in this region. Budapest agglomeration and the region of Northern Transdanubia received 80-85% of all FDI in the last 15 years (Fig. 1).

It must be noted that notwithstanding a stable territorial distribution there has been some change as well. Thus Budapest has clearly lost some of its former appeal in recent years. This is to be explained by the end of privatization and by the growing prospective costs of investments. When taken together with the agglomeration zone, however, the attractiveness of the Budapest metropolitan area has not decreased. It is only that investors have become more interested in areas located beyond the administrative boundaries of

Region	Foreign share of subscribed capital		Foreign share of company statutory capital		
	1995	2001	2001	2002	2004
Northern Transdanubia	10.3	7.5	12.4	13.3	11.7
Central Transdanubia	6.9	9.4	8.3	8.4	10.1
Central Hungary	64.2	67.7	65.0	63.5	65.5
Southern Transdanubia	3.8	1.8	2.0	2.0	1.6
Northern Hungary	5.1	6.2	5.0	4.7	4.0
Northern Great Plain	4.5	3.5	4.1	5.2	4.8
Southern Great Plain	5.2	3.9	3.2	2.9	2.3
Total	100.0	100.0	100.0	100.0	100.0
Budapest	55.9	53.3	53.9	51.9	50.2

Tab. 1: Territorial structure of FDI (%)

Source: Hungarian Statistical Yearbooks, Budapest: Central Bureau for Statistics [KSH], 1996, 2001, 2002, 2003, 2004.

the capital. This is because the Budapest's municipality has sought to curb industrial activity by all available means and because brownfield investments are far more costly than greenfield projects which are still feasible in the agglomeration ring and there are other reasons, too. Territorial shares have been changing in Northern Transdanubia as well: Komárom, Esztergom and Győr

have improved their positions, while Székesfehérvár has fallen somewhat back. The share of the regions of Northern Hungary and the Northern Great Plain has improved by a few percentage points whereas the country's southern regions, i.e. the regions of Southern Transdanubia and the Southern Great Plain, have fallen behind.

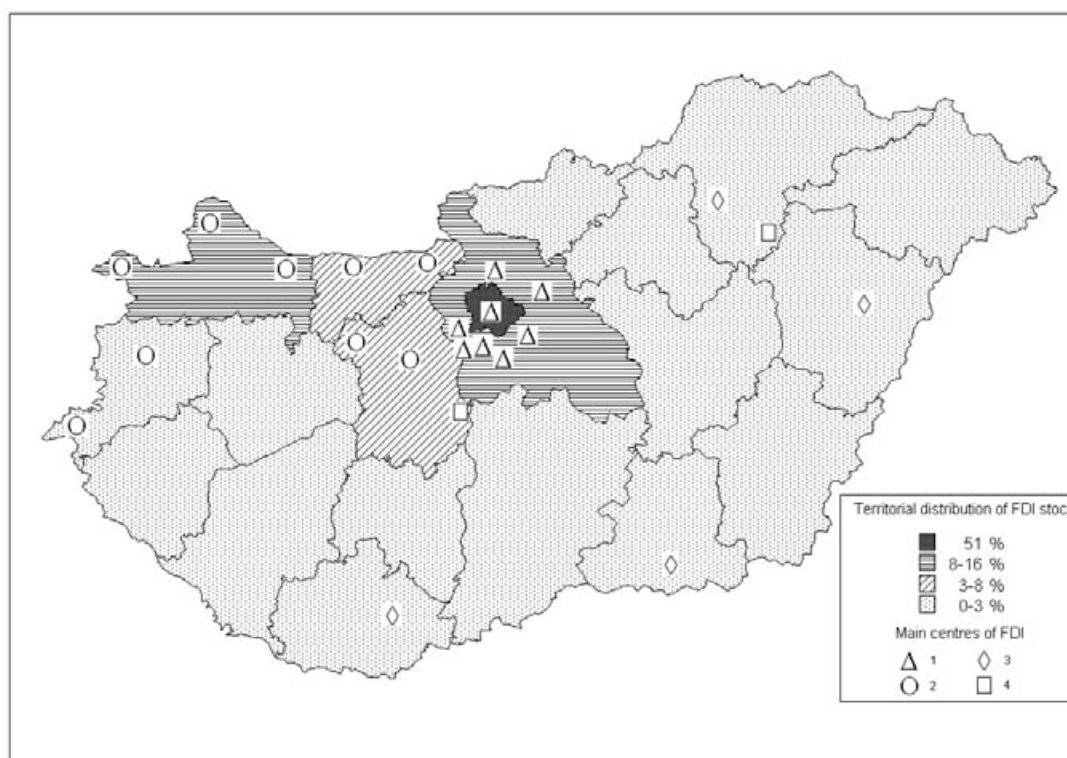


Fig. 1: Territorial distribution of FDI in Hungary

Notes: 1 – Budapest and agglomeration, 2 – Centres of automotive industry and electronics, 3 – Main regional centres, 4 – „Survivor” industrial towns

4. New developments in the territorial location of FDI

New developments could be observed in the territorial location of FDI in recent years. Privatization has largely come to an end. As a result, FDI is today largely made up of greenfield investments and additional investments of foreign companies already present in Hungary (Antalóczy, Sass, 2002). The role of investments belonging

to the latter category has increased. This leads to the stabilization of the FDI spatial structure. Concentration has increased and so has spatial clustering. Cooperation and partnerships among companies have become stronger, regional clusters have appeared, in some sectors even networks can be said to have struck root. The territorial concentration of foreign investment has been quite pronounced all over Eastern and Central

Europe. A significant share of foreign investments is concentrated in a 500-kms wide stretch in north-south direction located closest to Western Europe. At the same time, a new growth pole is beginning to take shape in Eastern and Central Europe in the Vienna – Brno – Bratislava – Győr – Budapest area.

Territorial clustering

We are talking, therefore, about an extended process that begins with agglomeration and continues through the appearance and networking of clusters. A new spatial structure of capital and production emerges leading to the increasing spatial differentiation and to the establishment of new growth poles. FDI plays a catalysing and multiplying role in this process. As regards the Hungary's example, we would like to stress that even though we partly present facts supported by the statistical evidence (especially on FDI clustering), most of the developments described here are still at a foundation stage. Therefore, the points referring to these may not always be backed up by empirical research. We hope, however, that by corroborating or denying our hypotheses a more detailed picture can emerge of main economic tendencies currently taking place in Central and Eastern Europe.

The sectoral and territorial concentration of FDI has been exceptionally strong. Territorial agglomeration signals, on the one hand, the satisfaction of investors with the performance of a certain region, but it also points to their readiness to exploit the advantages of spatial concentration and regional networking, on the other. FDI already present exerts a significant multiplying effect on the rest of the economy. Large investors have been quickly followed by their foreign suppliers and in many cases by their competitors too (as in the electronics industry, for instance). Some sectors have witnessed a marked concentration of manufacture (e.g. electronics and telecommunications industry, road vehicle manufacture) which in turn has also led to spatial clustering. Accordingly, the electronics industry has focused on Central Transdanubia, road vehicle manufacturing on Western Transdanubia and services centres on the Budapest agglomeration. Relations among the clustering companies have been of varying strength.

In some sectors clusters have emerged in order to promote manufacturing co-operations (e.g. car manufacturing clusters), elsewhere subcontracting networks have taken shape (e.g. electronics industry). Emerging clusters have been mainly constituted by multinationals in Hungary. These prefer to engage in co-operations inside their own networks and are less interested in geographical proximity (Szalavetz, 2001). Networking is driven primarily by foreign companies and by their foreign subcontractors, although more and more domestic companies have been able to take part as well (e.g. Videoton, Rába). Owing to networking the embedding of foreign companies has improved albeit at a slow pace.

Growing re-investment

Hungarian FDI has entered a mature phase (Antalóczy, Sass, 2000). The structure of FDI has undergone considerable changes. The share of FDI is still on the increase but the rate of re-invested revenues from total FDI has become increasingly significant. In 1997 the amount of re-invested profits has been relatively negligible. By contrast, since 2000 new investments have ceased to dominate and been overtaken by re-invested revenues (Tab. 2). Foreign companies have been ploughing back their profits into their enterprises to an ever growing extent. Approximately 60% of their net disposable income after taxes has been re-invested.

At the same time, it is also worth noting that the growing volumes of invested capital have been accompanied by a decreasing number of enterprises since 2002. This indicates the intensification of foreign investments. In other words, the capital concentration and the amount of foreign investment per enterprise have both grown.

The increasing readiness to re-invest tells of investor satisfaction and their future intentions to consolidate their presence in Hungary. Only Slovenia can boast with such a high rate of re-investment in this region. In other Central and Eastern Europe countries new investments continue to dominate (Antalóczy, Sass, 2002).

This shows that Hungary has entered a new and more intensive stage of FDI in which privatisation and greenfield investments no longer take the first place.

year	Reinvested revenues (in billion Hungarian Forint, HUF)	% of FDI increase	% of after taxes revenues
1996	77.9	17	58
1997	246.5	19	72
1998	251.1	35	56
1999	268.4	24	52
2000	297.3	55	53
2001	372.7	52	57
2002	462.6	66	59

Tab. 2: Development of re-invested revenues
Source: Central Bureau for Statistics [KSH], 2004

This fact has had significant territorial implications. The decreasing share of greenfield investments has slowed down changes in spatial structure. This is because, characteristically, re-invested capital is ploughed back in areas where profit was generated at the first place. That leads to the conservation of territorial structures. This also explains why the location structure of FDI has hardly changed and the strong spatial concentration, which already emerged in the early 1990s, has not been reduced (Antalóczy, Sass, 2005). In some other instances, however, the territorial distribution of FDI has been altered to some extent. Foreign companies located in Hungary begin to develop their own networks inside the country as well (e.g. GE, Chinoín, Flextronics, Bosch, Samsung, trade companies, etc.) – although this is true more of trade and other services than of manufacturing. Also, new greenfield investors discover new attractive settlements, typically in the areas of better accessibility. The government's targetted location-orientation policies promoting regional development objectives can also play an important role in bringing this about (e.g. Hankook investments in Dunaújváros, Electrolux in Nyíregyháza, Bosch in Miskolc).

New growth pole

The territorial clustering indicated above takes place in a macro-regional development zone. FDI in Central and Eastern Europe is concentrated in a 500-kms wide stretch running in the NS direction. Most investments are realized in the central and western regions (Carter, 2000; Pavlínek, 1998, 2004). Boundaries of core areas of the European Union have expanded eastwards, enabling the affected regions to become a part of the European economic structures owing primarily to their performance in the manufacturing sector.

The majority of the most significant investments have targeted the regions of capital cities (Warsaw, Prague, Bratislava, Budapest) and the regions of good accessibility situated geographically close to old EU member countries (Gdansk, the Poznan district, Lower and Upper Silesia, the central region of the Czech Republic, western Slovakia, north-western Hungary). Territorial clustering has been particularly pronounced in the dynamically expanding sectors of machine industry in Central and Eastern Europe. Vehicle manufacturing, for instance, is marked by the emergence of a multi-country regional cluster around multinational producers. Local enterprises have also joined this cluster although in much lower numbers. They only play a more significant role in the Czech Republic and Poland where this sector has been traditionally more established (van Tulder, Ruigrok 1998; Worrall, Donnelly, Morris, 2003). Road vehicle manufacturing industry of the Czech Republic, Poland, Hungary, Slovakia and Slovenia is located within a circle of 500km in diameter (UNCTAD,

2004). Individual production sites are integrated into an international manufacturing network via their respective parent companies. In the region of Central and Eastern Europe itself, they have become increasingly interlinked. The significance of cross-border relations has increased, indicating that this region is in fact on the way to establish itself as a unified sectoral cluster. For example, Volkswagen based in Slovakia uses engines manufactured in Hungary and Poland for its cars produced there. For the new joint PSA-Toyota investment in the Czech Republic several spare parts manufacturing plants were set up in southern Poland. Suzuki based in Hungary delivers engines for the Polish production site of a jointly developed vehicle of GM-Opel and Suzuki.

In our hypothesis, inside this dynamic economic region a new Central and Eastern European growth pole has been taking shape in the Vienna – Brno – Bratislava – Győr – Budapest area. In this region, the foreign investment is targeted on large cities which also compete with one another, and with the areas of high manufacturing potential located in between. This region has already attracted a total of more than \$100 billion worth of FDI. Regional cohesion has also improved, partly owing to the investments of regional players among each other. Austrian FDI has been particularly concentrated: in Budapest and the region of Northern Transdanubia in Hungary (EUR 3.5 billion) and in the Bratislava agglomeration in Slovakia (\$1.9 billion). The export of Hungarian FDI only began to gather pace in recent years but has continued to increase ever since. An important target area for the Hungarian FDI is Slovakia (investments by MOL, OTP etc. amount to almost EUR 1 billion) once again with a marked preference for this region. The Hungarian FDI in Austria exceeds EUR 30 million (Fig. 2).

5. Growing importance of regional development policies in economic policy-making?

In some cases, governmental regional development policy seeks to influence foreign investors' choice of location in order to offset the strong territorial concentration and to channel investors into areas previously neglected by FDI.

Newly-appearing FDI can contribute significantly to the economic recovery of the country's eastern and southern parts. It can provide impetus for both employment and higher value-added production in backward areas. However, this is conditioned by some improvements of the investment environment. These would involve primarily infrastructural developments and a rethinking of the system of financial incentives currently in place. EU-membership has modified the toolkit used by economic policy. Several non-EU-compatible instruments of economic policy formerly used had to be

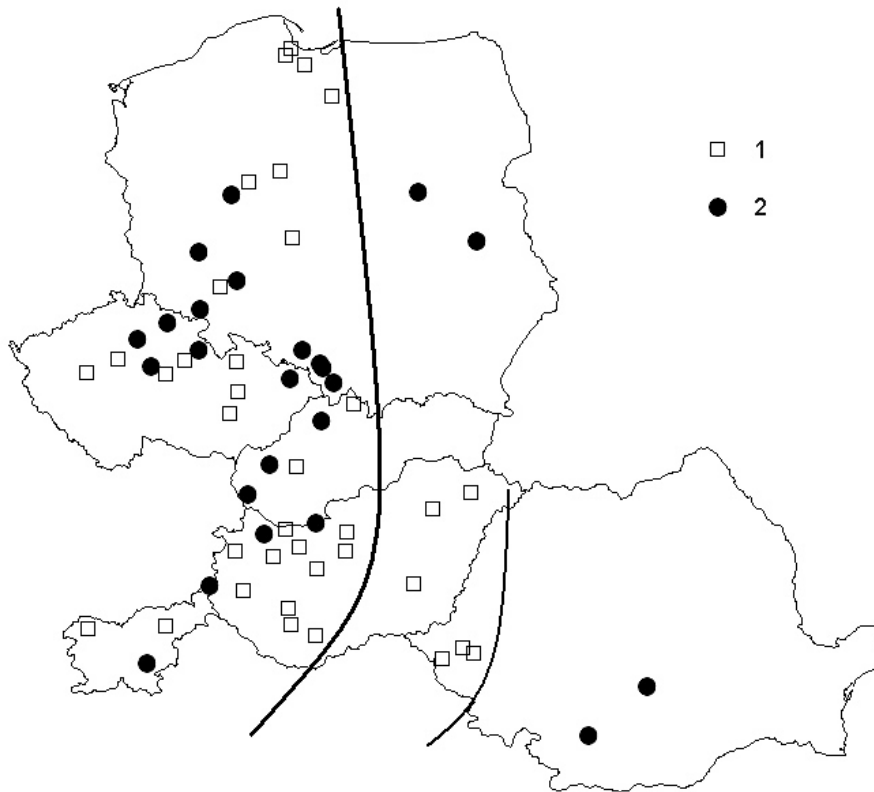


Fig. 2: The location of electronics* (1) and car manufacturing (2) companies in the countries of Central and Eastern Europe

Source: Kalotay, 2003; Kukely, Czira, 2006

*contract electronics manufacturing

abandoned or altered. At the same time, new resources of development have been made available (Structural Funds and the Cohesion Fund). Government's efforts to promote the regional development can be said to have been substantial in two specific areas. First, in the construction of motorways in order to improve the accessibility of deprived or slowly developing regions and second, in providing direct incentives to encourage the location of foreign companies.

The government's development priorities, at least at a level of planning, have begun to emphasize measures aimed at the recovery of backward areas. Investment promotion has given preference to non-financial instruments and to infrastructural development. In recent years the programme for the construction of motorways, which also serves to open up the backward regions, has quickly gathered pace. The Act on Motorways (2003/CXXVIII.) was passed in 2003 regulating the development programme for motorways and clearways until 2007 (e.g. definition of planned road-stretches, identification of budgetary resources, etc.). To complement the state financing, it is planned that other resources will be used as well. For the construction of motorways the government has not relied until now on EU-financed resources. Moreover,

the EU does not support the construction of motorways leading to non-member countries (such as Ukraine in the case of the M3 and Serbia in the case of the M5), even though these form a part of international transport corridors. Consequently, especially since 2004, PPP-type schemes with the inclusion of private investors have been used to finance constructions. This provides a considerable source of financing in addition to the budgetary resources. Nevertheless, the need of finance for building motorways was one of the main reasons for the imbalanced state budget.

The further development of the motorway network, especially the continuation of the M3 and the M5, and the construction of the first stretch of the M6 already started, have been expressly aimed at improving the accessibility of regions marked by slower economic growth. Improving the infrastructural conditions have already produced perceptible results. Foreign investments have appeared with increasing frequency in hitherto neglected regions of the country as well. In 1998 Bosch established a new production site in Hatvan. Keeping pace with the advancing construction of the M3 motorway, it has since then been shifting the focus of its investments gradually towards the country's eastern parts. Thus Bosch chose Eger and Miskolc for its latest investments in 2004.

The passing of the Act on Regional Development accorded a more prominent role to regions and to subsidies awarded on a regional basis. Since 1996, as a means of investment promotion more emphasis has been given to regional tax benefits to be claimed by investments realized in supported regions (e.g. entrepreneurial districts, counties with an unemployment rate above 15%). Investments to the value of at least 3 billion HUF¹ (approx. EUR 10 million) in backward regions profit from a full tax exemption for ten years. In so-called entrepreneurial districts every investment has received a tax exemption for the duration of five years. For machinery, appliances and infrastructural investments investors can claim a 6% tax cut in preferred regions and have in addition access to loans under more favourable conditions (Antalóczy, Sass, 2000).

In addition to the financial support, other incentives have been introduced as well. Until Hungary's accession to the European Union, this included the option to establish industrial tax-free zones. These tax-free zones were not identified on a territorial basis. Rather, manufacturing companies could establish them on a chosen production site and hence territorial considerations played only an insignificant role. This method contributed considerably to attracting export-oriented greenfield investments during the second half of the 1990s (Antalóczy, 1999). Since, however, this was not an instrument compatible with EU-regulations normal domestic tax conditions had to be extended to former tax-free zones by 2004. This in effect put an end to this important capital-attracting opportunity.

Accession to the European Union in 2004 altered the structure of investment incentives and transformed the system of governmental subsidies as well. Since this date, priority has been given to financial incentives. The rate of corporation tax was set at 16%, one of the lowest in Europe. Ten-year tax holiday for development was extended to investments of at least \$13 million and to at least \$4.3 million for supported regions. This could in practice amount to exemption from as much as 80% of the corporation tax. Subsidies for investments can be applied for via relevant calls of the Operational Programme for Economic Competitiveness and the so-called Smart Hungary Investment Promotion Programme. A more important role is now played by subsidies awarded by the government on an individual basis earmarked to support large-scale investments of major multinational companies, namely for investments in manufacturing above EUR 50 million and above EUR 10 million in the case of regional services centres.

Since Hungary's accession to the European Union (2004-5) the Hungarian government has committed

itself to pay 50 billion HUF (approx. EUR 170 million) in investment incentives until 2010 (while investors have pledged to spend a total of 350 billion HUF - approx. EUR 1,100 million - creating 10 thousand of new jobs). A considerable share of these investments is associated with already operating enterprises. Only a handful of new players have appeared. The government seeks to direct the greenfield investments to regions formerly overlooked by FDI (e.g. Nyíregyháza and Dunaújváros).

Most of the new investments can be linked to a few sectors. Car manufacturing (e.g. Audi, Suzuki, new tire producing sites of Hankook, Bridgestone, Michelin, vehicle glass production by Asahi) and the telecommunications sector (Nokia, Elcoteq, Balda) remain the best performing sectors. At the same time, a higher percentage of FDI has been spent on establishing service centres which have become more numerous in Hungary recently (e.g. IBM, Jabil, Cisco). These centres play an important role in raising employment as each one of them increases the number of employees by several thousand people at once.

Ultimately, the question is whether these measures can genuinely help to alter the spatial structure of FDI and whether they can perceptibly accelerate the recovery of backward regions?

6. The prospects of significant territorial changes in the location of FDI

What changes are to be expected in FDI? Can the territorial distribution of FDI be modified in accordance with (or contrary to) the government's intentions?

According to forecasts the industrial investments in the GDP will begin to increase once again after a period of temporary decline in recent years. The relatively high level of wages and its expected further growth is expected to move foreign investors to relocate relatively simple assembly-line, labour-intensive type of activities and to promote the settling of more complex activities in Hungary instead. The share of greenfield investments has steadily decreased. Externalities generated by sectoral and geographical clustering are seen as increasingly attractive. These tendencies favour industrialized counties, especially in the Northern Transdanubia and in the Pest county, but they also contribute to industrial development of large towns in Northern Hungary.

Tertiarization, the expanding range of business services and growing demands in terms of their quality, the increasing value of knowledge-bases favour metropolitan centres, especially Budapest's economy.

¹ HUF – Hungarian forint

The tendencies described above consolidate previously established territorial structures rather than encourage movements in space. Meanwhile, EU and government objectives outlined in the previous section can indeed contribute to accelerate the development of disadvantaged regions through the construction of motorways and the targeted location of new greenfield investments.

In light of the resources made available, we have reasons to doubt, however, whether or not these regional development policies will really be capable to offset the investment objectives of private investors which are driven by different priorities. It is equally questionable whether the state support for the regional recovery can counterbalance investments that contribute much more effectively to the country's economic growth and that, for obvious reasons, give preference to the most developed regions. The latest regional development blueprint rests on the notion of growth poles advocating the concentrated development of the seven largest Hungarian towns. It is yet to be seen, however, whether this programme will in fact be capable of amassing sufficient resources to reduce inequalities among urbanized regions.

Neither the current regional distribution and directions of FDI nor foreseeable short-term changes in the private sector predict significant new territorial developments. By contrast, concentrated regional development may succeed in bringing about perceptible changes. It is unrealistic to expect the essential reduction of territorial inequalities. Even the best scenario foresees only that the growth of territorial differences may be successfully halted. Urban centres of the regions may become

stronger and in their function as growth poles they may be able to exert a positive impact on the surrounding areas as well.

7. Conclusion

Privatization having come to an end, Hungary entered a new phase of FDI. At the same time, relative to neighbouring countries its competitive advantages and capital-attracting potential have decreased.

Territorially speaking, FDI has appeared in Hungary in an extremely concentrated fashion. 80-85% of all FDI is located in the Budapest agglomeration and in the region of Northern Transdanubia. This area has become part of a new Central and Eastern European growth pole, i.e. a dynamically developing economic zone. The volume of investments is significantly lower in other parts of the country. Changes in the territorial distribution of investments have been negligible. Nor can we look forward to major transformations in the future since the share of re-investments by companies already present has grown at the expense of new investments.

Regional development policies have sought to direct investments towards less preferred regions and to reduce territorial discrepancies by improving the infrastructural environment (construction of motorways and industrial parks in particular) and by providing financial incentives to investments. It is difficult, however, to strike the right balance between the principles of effectiveness and solidarity since the latter does not motivate private investors.

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DEMOGRAPHIC LOSSES OF THE SOVIET UNION IN THE PERIOD OF WORLD WAR II

Piotr EBERHARDT

Abstract

The paper brings a statistical analysis aimed at the determination of demographic losses suffered by the Soviet Union during World War II. The starting point is constituted by the presentation of opinions on the subject of Russian demographers and historians, which became the basis for a critical analysis of the substance matter and the statistical aspect of the issue. This analysis allowed the author for questioning about the scale of the war losses, as it was calculated and publicly announced in Russia. This scale was determined at a level of 26 million people. However, after the consideration of various aspects, the irreversible demographic losses of the Soviet Union caused by World War II were estimated by the author as equal to approximately 22 million. These losses can be subdivided into military – roughly 9 million, and civilian – approximately 13 million.

Shrnutí

Demografické ztráty Sovětského svazu v období 2. světové války

Článek přináší statistickou analýzu zaměřenou na stanovení demografických ztrát Sovětského svazu během 2. světové války. Výchozím bodem je prezentace názorů ruských demografů a historiků na tuto problematiku, které se staly základem pro kritickou analýzu podstaty a statistickým aspektem této problematiky. Tato analýza umožnila autorovi dotazování o velikosti válečných ztrát, neboť údaje o nich byly v Rusku zveřejněny. Rozsah ztrát byl stanoven na úrovni 26 milionů osob. Po zvážení různých aspektů byly však nenávratné demografické ztráty Sovětského Svazu způsobené za 2. světové války autorem odhadnuty na přibližně 22 milionů. Tyto ztráty lze dále dělit na vojenské – zhruba 9 milionů, a civilní – přibližně 13 milionů.

Key words: *Soviet Union, World War II, demographic losses*

1. Introduction

The domain associated with the precise determination of demographic losses borne by the USSR in the years of World War II was heavily charged in the Soviet period with a specific mythology, purposeful deformations and simplifications. It was only after the systemic changes and liquidation of rigorous censorship that Russian historians, geographers and demographers could start a comprehensive study of this difficult research problem. The subject is nowadays enjoying a high interest in Russia. This applies both to the media and the specialised scientific journals which verify the knowledge to date and put together various demographic balances, showing the losses that the USSR suffered during the years of the so-called „Great patriotic war“. The reports published represent differentiated competence and knowledge. They are charged with a high emotional load which impacts on their degree of objectivity. Yet, many detailed questions have been already fully explained. Other ones still give rise to doubts and require a further study and precision. This problem area is little known outside Russia and the former USSR, and it is also

subject to a definite mystification. Thus, it may be valuable to present in a critical manner the Russian research record in this domain, and to develop certain balance calculations showing the size of demographic losses of the Soviet Union in the years of World War II. In particular, the information concerning the number of soldiers of the Soviet Army killed during the war may be of special interest. They exceed common losses of all military formations of countries participating in World War II.

The precise estimation of total demographic losses of the Soviet Union requires a rejection of numerous myths common in the Russian literature and an uncovering of the true course of the political and military events. As mentioned before, this was not possible in the Soviet period. During the first years after the war the opinion pronounced by Stalin was repeated, who said in February 1946 that the Soviet nation lost a total of 7 million people in the war. This information was later on rectified only by Khrushchev, who said that 20 million Soviet citizens perished in the years of World War II.

2. Demographic issues in Soviet Union during WWII

The first basic condition allowing a proper assessment of demographic losses caused by war is to be able to precisely establish the population number and structure at the beginning of the war and then at its end. The resulting difference constitutes the premise for all kinds of calculations. It does not indicate automatically the size of irreparable losses since it neglects other important demographic parameters influencing the population numbers. An essential aspect impacting upon the population number is population migrations. The freewill or forced movements of migrants during the war may impact upon the post-war population numbers. A similar role is played by the net balance of natural processes, the number of births and the number of natural deaths. War losses can also have a quite differentiated character. Side by side with the direct casualties, we are dealing with the indirect war victims, whose number is often hard to determine. Political boundaries of the USSR underwent quite an essential change due to World War II. All kinds of demographic analyses have to account for the increase or decrease of the population numbers caused by the shift in the political reference unit. In the case of the Soviet Union we dealt with the incorporation into the country of a vast area in 1939-1940, whose population was already included in the post-war statistics.

For these numerous reasons significant divergences may exist in estimated statistics, resulting from simplifications and from the omission of causal factors impacting upon the population numbers. Without an appropriate and consistently applied methodological procedure one runs a risk of making errors influencing the ultimate outcome of the demographic balance. Statistical analyses referring to the estimates of the number of war victims are usually misleading since they are established on the basis of population censuses. It is obvious, though, that the censuses are not carried out at the beginning and at the end of the war. There are usually definite time spans between the last pre-war census and the beginning of war, as well as between the end of war and the first post-war census, these time differences hampering also the conduct of precise demographic balance calculations. This requires additional estimations for the peace period, which brings about further complications in the calculation of the war losses. Considering all these complex research issues Russian authors do usually not account for all the involved questions mentioned above in an appropriate and exhaustive manner. And so, one has to do in this domain with a lot of subjectivity, arbitrariness, and lack of precision. There is a tendency in current Russian elaborates to overestimate the number of war victims. This tendency can be identified on the basis of a survey of the Russian literature devoted to the subject in question.

There were two population censuses carried out in the Soviet Union just before the war. The first of them took place in 1937, while the second one was dated only two years later: in 1939. These two censuses constitute an essential reference point for the initial consideration of the magnitude of demographic losses borne by the USSR during World War II. According to the first of these censuses the population number was equal to 162.0 million (including 2.9 million being at a disposal of the Peoples Commissariat for Internal Affairs, NKVD, and 2.1 million – at a disposal of the Peoples Commissariat for Defence, NKO). The information on this census was made secret, and its organisers were submitted to persecutions. The reason for the punishment was the fact that the census revealed the enormous number of victims of the 1930s, associated with the collectivisation of agriculture and the deadly famine. The results of this census were found and publicized only in the 1990s. In 1939, another census was carried out at Stalin's order. After the census had been carried out it was officially announced that the population of the USSR was 170.5 million. This was a tendentiously overestimated value since a true population number on the day of the census (17 January 1939) was equal to 167.3 million (Vsesoyuznaya ..., 1999, p. 10). The subsequent population census took place only a dozen years after the war, in 1959, and reported the population of 208.8 million. Knowledge of the demographic situation from the period 1939-1945, and especially from 1941-1945, is fragmentary. A definite facilitation, allowing for a more precise statistical analysis, is provided by the information from the Soviet statistical services that after the end of the war, on 31 December 1945, the population of the USSR within the new political boundaries was 170.5 million people (Gorod..., 2001, p. 49). These basic statistical data are a starting point for the estimation of direct war losses borne by the population of the Soviet Union. This would imply that the issue is relatively simple and should not give rise to any more serious scientific controversies. The situation is completely different, though. Between the two censuses there were important politically motivated migrations and an essential change of the Soviet Union boundaries. These factors significantly influenced the population number. In demographic analyses they are explained in a differentiated way. That is why the estimates provided by Russian authors differ significantly and give rise to serious statistical and substantial reservations.

The initial stage of the World War II made it possible for the USSR to gain important territorial acquisitions. The Soviet Union, after the aggression against Poland, incorporated into its territory Polish eastern lands (according to the Soviet terminology: western Ukraine and Belorussia), the area inhabited, as of 31 August 1939, by 13,199,000 people (including the region of Vilna, incorporated for a short period of time into the

independent Lithuania)¹. Subsequent acquisitions are connected with the incorporation of three Baltic states (Lithuania, Latvia and Estonia) in 1940, populated by 6.1 million inhabitants. The annexation of the entire Bessarabia and the northern Bukovina in the same year increased the population number of the USSR by further 3.0 million people. When, after the aggression against Finland and a war lasting several months, the region of Vyborg and the area of Petsamo on the Barents Sea were included in the Soviet Union, the resulting demographic change was, however, not significant, since the Finnish population living there was to a large extent resettled to Finland. Thus, a total population number on the territories incorporated by the USSR in 1939-1940 amounted to approximately 22.3 million.

In order to determine the demographic losses suffered by the USSR in 1941-1945 it is necessary to calculate the population number for the date of 22 June 1941. The starting point is the actual population number of the Soviet Union at the instant of the last preceding census, i.e. in January 1939. After verification, this number was estimated to be 167.7 million. One should modify this number by accounting for natural increase having taken place in 1939 and 1940, and in the first half of 1941. We can admit that during two years and a half before Hitler's aggression the population of the Soviet Union increased owing to the surplus of births over deaths by 6.7 million people. One should add to this the population inhabiting the areas incorporated into the Soviet Union, estimated at 22.3 million. This would mean that the population number of the USSR, within the new boundaries, was on 22 June 1941 equal to 196.7 million. A similar calculation was carried out by B. C. Uralis (1966, p. 20), who estimated that the population of the USSR on the day the Soviet-German war begun was equal to 199.0 million. The difference between the two calculations is contained within the range of the statistical error (here around 1.5%).² Yet, even this difference has an important bearing on the estimates of war losses which are considered by Russian scholars in quite a variety of manners. A critical presentation of more known views on the subject and then of an own view may altogether constitute a valuable

material facilitating the development of the opinion on this important historical issue of the Soviet Union.

A valuable publication in this domain is the report of V. I. Kozlov (1989, p. 132-139), which may be treated as an example of the approach of a Russian demographer, trying to explain this difficult and controversial research problem. Irrespective of the lack of arithmetic precision the author lists all categories of demographic losses which the Soviet society suffered during World War II. He starts his considerations with the hypothetical balance presented by Yu. A. Polyakov (1989, p. 87), in which a demographic forecast is shown based on the assumption of non-participation of the USSR in World War II. According to this fully hypothetical scenario the Soviet Union would have had in 1946 approximately 212-215 million inhabitants. According to the author the population of the USSR was in reality equal at the beginning of 1946 to roughly 167 million. The difference between the hypothetical and the actual population numbers would therefore amount to 45-48 million. When presenting these calculations V. I. Kozlov treats them even as an underestimation and proposes that were it not for the war the population number of the USSR would have been higher in 1946 by at least 50 million than the actual one. He is not accounting however for the essential issue, namely for the fact that the territorial gains of the Soviet Union after 17 September 1939 and the associated increase of the population number of the Soviet empire was linked already with the beginning of World War II.

In his further considerations V. I. Kozlov (1989, p. 135-138) passes over to demographic details, that is – to the determination of actual war losses. His estimations start with the assessment of the significant deficit of births during the war. In accordance with his evaluation, owing to the recruitment of men to the army and harsh living conditions, 10 million children less were born during the years of war than would have otherwise been born. Then the author goes on to estimate military losses. He accounts not only for the direct death toll of the military action, but also for the Soviet POWs killed by Nazis. The

1) One of the myths, constantly repeated in the Soviet historical literature, was the opinion that the lands of eastern Poland, taken by the Soviet Union owing to the Ribbentrop-Molotov treaty, were inhabited uniquely by the Belarussians and Ukrainians. In reality these areas were characterised by quite a complex ethnic structure. They were, namely, inhabited by 5.1 million Ukrainians, 4.5 million Poles, 2.1 million Belarussians, 1.2 million Jews, and 0.3 million of other nationals (these data encompassing also the Białystok district). Source of Poland's ethnic composition before the WW II data: Concise Statistical Year-Book of Poland September 1939-June 1941, published by The Polish Ministry of Information, London 1941.

2) These issues give rise to controversies and excite interest among the Russian demographers. Recently, the question was taken up by Y. Degtyarev (1999, pp. 3-4), who assumed that the population number of the Soviet Union on 1 January 1941 was 198.7 million, of which on the areas incorporated after 17 September 1939 – 20.7 million (including 8.2 million in the so-called western part of the Ukrainian Soviet Socialist Republic, 4.8 million in the „western part“ of Belorussia, 1.6 million in Bessarabia and Northern Bukovina, 3.0 million in Lithuania, 2.0 million in Latvia, and 1.1 million in Estonia). By adding the natural increase in the period between 1 January 1941 and 22 June 1941 Degtyarev arrives at a round number of 200.0 million people (Y. Degtyarev, 1999, p. 4). It can be judged that the author overestimates the number of USSR population within the boundaries as at the beginning of 1939, while underestimating by approximately 1.6 million the number of people living on the territories annexed by the Red Army in the first phase of World War II. This author, though, does not specify whether he accounts in his calculations for the district of Białystok, occupied by the Soviet Union between 28 September 1939 and 22 June 1941.

thus calculated military losses amount in his opinion to 11-13 million. Later on, subsequent Russian analyses brought more precision into this question.

The author writes also about the issue that used to be a taboo in the Soviet literature, namely about the losses among Soviet citizens collaborating with the Nazi occupational authorities. When speaking of losses among the civil population he mentions the death of 800,000 inhabitants of Leningrad under siege. According to his assessment the number of Jews killed was equal to approximately 2.5 million. He comments also on demographic losses in territories not occupied by Germans. Here, he writes about the fate of deported nations (though not mentioning Poles), and about the deadly regime in Stalinist camps. A very rough estimate of losses among the civilian population, given by this author is 15-20 million. Summing up the calculations made this author arrives at a total estimate of direct losses between 26 and 33 million people. Yet, in closing remarks he maintains that a general demographic loss amounted to 40 million people.

The calculations presented, giving rise to numerous doubts, became a starting point for further studies in which attempts were made to bring more precision into the estimated size of demographic losses in the Soviet Union. A valuable publication is the study by V.G. Pervyshyn (2000) who returns once again to this issue, still constituting the subject of debate in the Russian society. This author, in turn, provides a number of new findings unknown to date. He attempt at a general balance of demographic losses borne by the population of the Soviet Union in the war years. That is why it is worthwhile to quote some more important elements of Pervyshyn's reasoning and calculations. Thus, in particular, when showing the scale of direct military losses he refers to both German and Soviet sources³.

The same scholar, when speaking of losses among the civilian population, estimates for instance the number of losses caused by the blockade of Leningrad at 2.3 million people, which is a significant overestimation since official estimates range between 642,000 and 900,000. He then

goes over to the general demographic balance of war years, providing the calculations existing in the literature on the subject, as well as his own assessments. A starting point for the author is the estimate for the day of 22 June 1941, that is: 200.1 million inhabitants (although it can be supposed that the actual population number was lower by 3.5 million). He then gives the number of births recorded during the war, namely 9,194,000. According to post-war data quoted by Pervyshyn, the population number of the Soviet Union on 31 December 1945 was 170.5 million. This would amount to stating that total losses resulting from the war were equal to approximately 38,794,000 people. This latter calculation, though, gives rise to substantial reservations. Not only because of the purely mechanical way of calculating the balance, but also in view of a definite statistical inaccuracy.

One can find more reliable calculations in the book Gorod... (2001, p. 49), which refers to the work of three Russian statisticians (Andreev et al., 1990). Here, the analysis is based upon the population numbers as of the middle of 1941 (196.7 million) and the beginning of 1946 (170.5 million). It was calculated that in the latter population 159.5 million were the persons born before the war. This would suggest that 37.2 million of Soviet citizens did not survived until the end of war. By subtracting the assumed normative deaths for the period of 4.5 years (11.9 million), the authors arrive at a conclusion that the demographic losses amounted to 25.3 million, this number being then yet modified by same marginal calculations to attain ultimately 26 million.

3. Soviet army casualties

The number of roughly 26 million (most often, actually, 26.6 million) entered already the Russian literature of the subject as a proven fact and is in principle not being questioned⁴. A further question which became the object of study and calculations, was the division of the entire volume of losses into parts concerning the military forces of the USSR and the civilian population. Owing to the publication of monumental work, devoted

3) Thus, in particular, the question was in principle fully explained, which for several decades could not be openly discussed in the Soviet Union, namely the one of the number of the Soviet POWs, taken by Wehrmacht. According to German historian D. Gernes the Nazi army took altogether 5,754,000 Soviet soldiers as prisoners of war, namely 3,355,000 in 1941, 1,653,000 in 1942, 565,000 in 1943, 174,000 in 1944, and 32,000 in 1945. Similar calculations were presented by Russian scholar B. V. Sokolov, according to whom the number of the Soviet military taken POWs by the Germans was 6,206,000, since it was higher in 1941, reaching 3,807,000. The first year of war brought the biggest losses among the Soviet soldiers. According to the information provided in the report the military losses in action and among the POWs amounted in 1941 alone to 6,460,000 (with 3,900,000 having been the POWs). Until February 1942 only 1,100,000 of the POWs survived in German camps. It is altogether estimated that approximately 4 million Soviet military, taken POWs by the Germans, have not survived the war (Pervyshyn, 2000, pp. 118-119). There are, however, highly significant divergences in this domain, since another Russian book gives the information that in 1941 Germans took 2,561,000 Soviet soldiers as POWs (of whom 300,000 in the area of Białystok, 103,000 – of Humań, 450,000 – of Vitebsk and Homel, 180,000 – Smolensk, 665,000 – Kiev, 100,000 – Chernihiv, 100,000 – Mariampole, and 663,000 – in the area of Viaz'ma, see Krivosheev, 2001, p. 461)

4) It is assumed in the Russian literature that the war, in which USSR took part, lasted between 1941 and 1945. In terms of such an interpretation the war with Finland, the aggression against Poland, co-ordinated with Germany, the military incorporation of a part of Romania, as well as Latvia, Lithuania and Estonia, and the conflict with Japan, that is – the events of years 1939-1941, belonged in the „period of peace“.

to this subject (Rossiya..., 2001), it can be stated that the first of these difficult questions was already to a large extent explained. Yet, before considering the subject, one should mention military conflicts directly preceding Hitler's aggression against the Soviet Union. Thus, in the Soviet-Japanese war, which took place in August 1939, military losses of the Soviet side amounted to 9,703 soldiers and officers. The joint aggression with Germany against Poland in September entailed the death of 1,475 Soviet military. The conflict with Finland brought much more serious losses. During heavy fights in the winter of 1939/1940 as many as 126,875 Soviet military were killed. The additional military casualties (wounded, shocked, etc.) of the Red Army in the war with Finland amounted to 264,900 people (Krivosheev, 2001, p. 179, 187, 213). These losses, though by no means small, only marginally influenced the population of the Soviet Union. On the other hand, the Soviet-German war brought enormous consequences and weighed heavily on the demographic potential of the USSR. The irreversible losses of the Red Army were extremely high and that is why they require a more detailed reporting.

Losses suffered by the Soviet army were highest during the first phase of the war. Let us note that in the period from 22 June 1941 – 9 July 1941 the losses in terms of death numbers amounted to 341,100 within the Belorussian part of the front, and to 172,300 at the Ukrainian front, while in the period from 10 July 1941 – 30 September 1941 at the Leningrad front – to 214,100. The heaviest losses were the effect of the encirclement

of Soviet troops near Kiev. This operation, having taken place in the days between 7 July 1941 and 26 September 1941 ended with losses on the Soviet side amounting to 616,300 soldiers and officers. Losses were getting smaller in the later, victorious phase of the war. Thus, for instance, in the final Stalingrad battle (19 November 1942 – 2 February 1943) 154,900 Soviet military were killed. Then, in turn, in the largest armoured battle of the 20th century, below Kursk (5 July 1943 - 23 July 1943), losses of the Soviet army amounted to 70,300. Taking of Berlin and the ultimate annihilation of Hitler's army (16 April 1945 - 8 May 1945) entailed life victims of 78,300 Soviet military. Total losses of the Soviet army between 22 June 1941 and 9 May 1945 equalled to 11,273,100 persons⁵. On the Far East front, in the struggle with the Japanese, only 12,000 Soviet soldiers were killed (see Tab. 1).

The army losses (11,285,100 persons, or, after certain additional estimations – 11,444,210) were split up into several categories. The first of them includes those killed directly in action and having died of wounds yet within the battlefield (5,226,800 persons), followed by those having died in hospitals behind the frontline (1,102,800). A separate group was constituted by the military having died due to diseases, in accidents, and shot upon the verdicts of military courts (555,500). Quite a vast category consisted of persons considered lost or taken prisoners by the enemy (3,396,400). The remaining categories of losses of the military amounted to altogether 1,162,600 persons.

Periods of war	Campaigns	Numbers of days	Military losses	
			number, '000	percent of the total
First: 22.06.1941- 8.11.1942	Summer-autumn: 22.06.1941 – 4.12.1941	166	2,841.9	25.2
	Winter: 5.12.1941 – 30.04.1942	147	1,249.0	11.1
	Summer-autumn: 1.05.1942 – 8.11.1942	202	2,064.1	18.3
	Subtotals for the first period	515	6,155.0	54.6
Second: 9.11.1942 - 31.12.1943	Winter: 9.11.1942 – 31.03.1943	133	967.7	8.6
	Strategic break: 1.04.1943 – 30.06.1943	91	191.9	1.7
	Summer-autumn: 1.07.1943 – 31.12.1943	184	1,393.8	12.3
	Subtotals for the second period	408	2,553.4	22.6
Third: 1.01.1944 - 9.05.1945	Winter-spring: 1.01.1944 – 31.05.1944	152	801.5	7.1
	Summer-autumn: 1.06.1944 – 31.12.1944	214	962.4	8.5
	European: 1.01.1945 – 9.05.1945	129	800.8	7.1
	Subtotals for the third period	495	2,564.7	22.7
The Soviet-German front: 22.06.1941 – 9.05.1945		1 418	11,273.1	99.9
The Soviet-Japanese front: 9.08.1945 – 2.09.1945		25	12.0	0.1
Grand totals		1 443	11,285.1	100.0

Tab. 1: Demographic losses of the Soviet Army in the years of the World War II
Source: Krivosheev (2001, p. 263)

5) The essential part of these losses took place within the territory of the USSR. In the final phase of the war, though, a lot of the Soviet military were killed outside the Soviet Union boundaries, namely: 600,200 in Poland, 139,900 in Czechoslovakia, 140,000 in Hungary, 102,000 in Germany, 69,000 in Romania, 26,000 in Austria, etc., see Krivosheev, 1995: Ob itogakh statisticheskikh issledovaniy poter vooruzhennykh sil SSSR v Velikoy Otechestvennoy Voynе (On the results of the statistical studies of the losses suffered by the military forces of the USSR in the Great Patriotic War; in Russian); in: Ludskiye poteri SSSR v Velikoy Otechestvennoy Voynе, Sankt Peterburg, p. 80.

Yet, it must be emphasised that not all the categories mentioned can be classified as so-called irreversible losses. Thus, the POWs and the lost category included many of those who in fact survived the war. It is estimated that there were 2,775,700 of the survivors. Hence, the quoted statistical documentation gives the irreversible losses at 8,668,400 of the officers and privates⁶.

The latter number, though, is also questioned, since it does not account for the complete balance of changes in the military staff. According to the Russian scholar G. F. Krivosheev (1995, p. 76) such a complete estimate ought to take into account Soviet POWs who survived the war in German camps (1,836,000 persons), recruits having effectively entered the army, but not officially registered (500,000), and Soviet soldiers who left the ranks of the Soviet army in the first phase of war, to get mobilised into it again (939,700 persons). After this rectification the author establishes the irreversible losses of the Soviet army as equal to 9,168,400. The arithmetic difference with respect to the previously reported statistical documentation results from the fact that Krivosheev assumes as the starting point a direct demographic loss of the Soviet army in the years of war to be equal to 11,944,100.

It should be judged that these relatively small differences do not have any substantial importance. We can, therefore, conclude that due to the war some 9 million Soviet military died⁷. In terms of nationalities this number includes 5,756,000 (66.4%) of Russians, 1,377,400 (15.9%) of Ukrainians, 252,900 (2.9%) of Belorussians, 187,700 (2.2%) of Tatars, 142,500 (1.6%) of Jews, 125,500 (1.5%) of Kazakhs, 117,900 Uzbeks, etc. (Krivosheev, 2001, p. 238).

4. Civil population casualties

The issue of the magnitude of losses among the civil population of the Soviet Union has not been until now unambiguously explained⁸. The losses among the civil population were due to a variety of reasons. These reasons were not only associated with the terror against the civil

population on the territories occupied by Germans, as this was being explained in the Soviet literature during decades. We do not mean to play down these losses, which were certainly very acute. One should account, though, for the fact that this terror and the resulting losses, had a selective character, since they applied primarily to the Jewish population, and same areas of Belorussia'. A much greater impact on the overall losses of civil population resulted from hardships behind the frontline. The food supply situation was critical. This situation brought about increased mortality, especially among the elderly and the infants. The extraordinary mortality rates affected, in fact, the entire civil population. Besides, hundreds of thousands of people died in camps, which functioned continually in Siberia and in a so-called Far North. According to recently published data, in 1941-1943 as many as 516,800 persons died in the Gulag camps, while in subsequent years – 104,800 persons (Zemskov, 1991, p. 176). Decisions were made of deporting the entire nations (Tatars, Kalmyks, Germans, Chechens, etc.). These movements caused high casualties among the deportees. The losses occurred during many weeks of escorting and then at the places of destination that were completely unprepared for the reception of mass transports of people. Not only hundreds of thousands of deportees died of hunger and exhaustion. The fate of the entire population, working hard for the needs of the army in conditions of constant under-nourishment, was not much better.

During the front passage through towns and military operations in them (Stalingrad, Leningrad, Voronezh, Smolensk, Sevastopol) a lot of civilians died. The general conditions caused a radical decrease of the number of births and a steep increase of mortality. This issue has been so little studied, that it is hard to estimate whether mortality among the civilian population under the Nazi occupation was higher than behind the frontline on the Soviet side. Immediately after the recapturing of the Baltic states, the western Belorussia and Ukraine pacification measures were adopted to liquidate the anticommunist guerrilla. Following these actions subsequent deportations were carried out, bringing further acute losses among the population.

6) This category of irreversible losses includes the killed in action, the dead of wounds and diseases, the executed by Soviet military courts, and those not having returned from the enemy camps. These losses, amounting to 8,668,400 are equivalent to 71.4% of all the military losses suffered by Russia, USSR and Russian Federation in all the military conflicts of the 20th century, i.e. of the total of 12,132,700. The consecutive places in this statistics are taken by World War I (the death of 2,254,400 Russian soldiers), the civil war of 1918-1920 (980,700 dead), the Finnish-Soviet war of 1939-1940 (126,900), and the Russian-Japanese war of 1904-1905 (52,500), see Krivosheev, (2001), pp.594-595. This list, though, does not mention the Polish-Soviet war of 1919- 1920.

7) A separate treatment ought to be reserved for Soviet citizens who entered the military detachments organised by Nazi authorities. The troops composed of the former Soviet citizens fighting on the German side, counted several hundred thousand soldiers. These troops included the ROA divisions of general Vlassov, several Waffen SS divisions, including two Latvian ones (the 15th and the 19th), two Russian ones (28th and 30th), one Ukrainian (14th), and one Estonian (20th), then the 15th Cossack corps of general Von Pannwitz, the 16th Turkestani division, and the „Dneper“, „Berezyna“, and „Volga“ groupings, composed of the Muslim soldiers and the inhabitants of Caucasus (Anders, 1997, pp. 149-176). These troops suffered heavy losses. They fought mainly at the eastern front. In case of being taken prisoner by Soviets these soldiers were shot. Many of them were passed after the war to Soviet authorities by western allies. They were treated as traitors and most of them were executed.

8) In March 1995 a conference took place at the Institute of History of the Russian Academy of Sciences, devoted to the demographic losses of the civil population of the USSR in the years of World War II. It resulted in an ample publication consisting of a dozen reports, which indicate the necessity of conducting further studies in order to explain this difficult problem (Ludskiye..., 1995).

Estimates of Russian scholars as to the scale of losses among the civilian population are divergent and give rise to serious reservations. Thus, for instance, A.A. Sheryakov (1995, p. 180) estimates that losses of civilians under German occupation amounted to 20.8 million people including 11.3 million subject to organised extermination, 6.5 million people died of hunger, and 3.0 million people perished while on forced labour in Germany. These estimates are far from reality. The respective losses are usually assessed as lower, and are determined on the basis of an arithmetic calculation. The total of (irreversible) losses amounted to 26.6 million, with those of the military equal to 8.7 million. Hence, the losses among the civilian population would amount to 17.9 million (Krivosheev, 2001, p. 519)⁹. Such a reasoning would be justified, were it not for the influence of net migration flows (which were by no means equal to zero), and the important changes of boundaries of the USSR between 22 June 1941 and 31 December 1945. That is why the quoted figures require further study and verification.

5. Influence of migrations and border changes for the Soviet population

It is beyond any doubt that the decrease of the population number between 22 June 1941 and 31 December 1945 attained an extremely high level of approximately 26.2 million (1941 – 196.5 million; 1945 – 170.5 million)¹⁰. This is, of course, not to say that this number of people died in the period of the Soviet-German war. Let us indicate some questions neglected by the above quoted authors. Thus, there were definite boundary changes between 1941 and 1945. In particular, the region of Białystok, which was incorporated to the USSR in the period 1939-1941, returned to Poland, similarly as a borderland area close to Przemyśl. These areas encompassed 23,000 sq. km, and were inhabited in 1939 by 1,343,000 persons¹¹. Immediately after the war the Transcarpathian Ruthenia with some 800,000 inhabitants was annexed to the USSR. The difference resulting from the two annexations amounts to 543,000 persons, and this is by how many persons the population of the Soviet Union decreased due to the reasons mentioned. The remaining border changes did not bring any population – related consequences, since after the inclusion of the northern part of East Prussia the entire German population was resettled in Germany until 1948. Similarly, the Finnish population was removed from the area of Vyborg and from Karelia

(295,800 persons), and the Japanese population from the northern Sakhalin and the Kuriles Islands (424,000 persons), see V.M. Kabuzan (1996, p. 233).

The greatest population exchange took place between the USSR and Poland. It was caused by the important eastward shift of the Polish-Soviet border. A bilateral agreement was concluded, on whose basis a large part of the Polish population having remained on the Soviet side of the border was allowed to move to Poland. Within the framework of this official repatriation 1,507,000 persons came to Poland. Side by side with the formal repatriation nearly 700,000 persons moved to Poland from areas lost by Poland to the advantage of the USSR. Thus, it is estimated that the broadly conceived repatriation encompassed altogether 2.2 million people. The population census carried out in Poland in 1950 brought the number of 2,136,000 persons, whose place of residence on 1 September 1939 was within the territories to the East of the Curzon line, and who found themselves in 1945 within the boundaries of the Soviet Union. At the same time, on the basis of agreements signed, 480,000 of Ukrainians and 34,000 of Belorussians left Poland for the USSR just after the war. Hence, the negative balance of migrations with Poland was at approximately 1.7 million persons (Eberhardt, 2002, p. 227).

Following the Russian demographer S.I. Bruk (1994, p. 61) we can also add that in the years 1939-1944 roughly 600,000 Germans left the territory which was incorporated into the USSR in 1940. This number has to be treated separately from 1,157,000 Germans, having inhabited the northern part of East Prussia, who were resettled after the war in Germany. Yet, the group of Germans mentioned was not accounted for in the respective balances, since they lived until 1945 in the territory constituting an integral part of Germany.

The three Baltic states were left during the war by approximately 230,000 Lithuanians, Latvians and Estonians. Besides, some 34,000 Czechs, having lived in Volhynia, a region of the present-day Ukraine, left for Czechoslovakia.

During the retreat of the German army more than half a million persons of a variety of nationalities left also the territory of the Soviet Union, with the largest group among them constituted by Ukrainians. This group was

9) One of the few Russian demographers, who assume the possibility of a lower level of the demographic losses caused by World War II, is S. N. Mikhailev (1995, p. 84). He considers three figures: minimum - 21.2 million, intermediate - 23.6 million, and maximum - 25.9 million.

10) The state as of 31 December 1945 was determined on the basis of the census of 1959 and the data on the natural demographic processes having taken place between 1 January 1946 and 15 January 1959. This means that neither the Germans staying until 1948 in the northern part of East Prussia, nor the Poles waiting for the resettlement from the former eastern territories of Poland to the post-war Poland, were accounted for in the estimate concerning 31 December 1945.

11) The district of Białystok in north-eastern Poland and small areas on the eastern side of the river San in south-eastern Poland belonged formally to the USSR in the period between 28 September 1939 and 22 June 1941, to then return to Poland on the basis of the agreement between Poland and the USSR concluded on 16 August 1945. These areas were mainly inhabited by Poles (around 850,000), but also by Belorussians (220,000), Jews (180,000) and Ukrainians (120,000).

composed of various categories of fugitives. Side by side with the members of military detachments formed of the Soviet citizens, who fought on the German side, there was also a lot of the civilian population who feared the return of the Soviet authorities and the punishment for the collaboration with the Nazi occupants.

Numerous Soviet citizens were deported during the war by the Nazi authorities to forced labour on the German territory. This group included also the Soviets taken POWs. All these persons were subjected after the war to so-called repatriation action, that is – they were formally obliged to return to the USSR. According to the official documentation, presented in the report by V.N. Zemskov (1990, p.26), there were 6,979,500 Soviet citizens outside the Soviet borders after the war, among whom 2,000,700 were the former Soviet military, taken POWs by the Germans. In the effect of the organised repatriation 4,304,400 persons returned to the USSR. Yet, another report (Liudskie..., 1995, p. 180) gives the information that on the areas liberated by the Soviet and western Allied troops there were altogether 5,917,000 Soviet citizens of whom 2,016,000 were former POWs. After the repatriation 688,000 Soviet citizens would have stayed in the West. The latter number, though, is clearly underestimated, since numerous German data indicate a much higher number of persons who did not obey the order of repatriation¹². The population decrease of the Soviet Union between 1941 and 1945, amounting to approximately 26.2 million people, includes also all these

migration- related losses, summing up to more than 3.5 million people. Thus, taking into account the negative migration balance and a certain marginal decrease of the population number entailed by the change of boundaries, we can conclude in a justified manner that irreversible biological losses of the USSR caused by war amounted to at most 22 million people. This figure can be divided into the military losses – 9 million and the losses among the civil population – about 13 million.

6. Conclusions

The information, provided by the Russian literature concerning the subject, namely that the demographic losses of the Soviet Union amounted to 26 million, should be put to doubt. Yet, a more difficult problem is constituted by the territorial division of the losses. It can be supposed that in relative terms the highest losses were suffered by Belorussia and by the Baltic states. An even harder issue is the assessment of losses by nationalities. The most acute losses were definitely suffered by the Jewish population¹³. Then, the proportionally highest losses among the civil population affected the Lithuanian, Polish and Belorussian populations. Without any doubt, the largest number of soldiers died during the war was of Russian nationality since it was the Russians who constituted the core of the Soviet Army. All these issues have not been fully explained to date. Moreover, we can also expect that some of them will stir constant controversies, finding their expression in the respective literature.

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12) The persons deported to labour in Germany from the Baltic states and from the eastern part of Poland, incorporated into the USSR, usually declared to western allied officers their citizenship from the period before 1939, which allowed them to avoid repatriation to the USSR.

13) M. Kupowetskii (1995, pp. 134-155) undertook to evaluate the losses suffered by the Jewish population. According to this author, during World War II 1,100,000 Jews having had Soviet citizenship before 1939 perished. Besides, 1,600,000 Jews inhabiting areas annexed by the Soviet Union in the years 1939-1940, did not survive the war either.

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THE IMPACT OF SUBURBANISATION IN THE HINTERLAND OF PREŠOV (SLOVAKIA)

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Abstract

The impact of suburbanisation on the hinterland of Prešov, the third largest town in Slovakia, is presented in the current study. Significant aspects of suburbanisation – selective migration, the spatial differentiation of housing conditions in the suburban zone, social and economic segregation, as well as commercial activities and their distribution, and/or the collapse of a geographical hierarchy – are singled out for particular attention. A theoretical framework is outlined in the first part, based on a brief review of the suburbanisation process and its conceptualisation, as well as its attributes and spatial forms. The specific situation in post-communist countries is briefly analysed. The empirical research subsequently reported in this study, explores basic processes occurring in the Prešov hinterland due to suburbanisation.

Shrnutí

Projevy suburbanizace v zázemí města Prešova (Slovenská republika)

Príspevok zaznamenáva prvotní projevy suburbanizace v zázemí Prešova, třetího největšího města Slovenska. Cílem je především poukázat na některé výrazné aspekty suburbanizace v příměstské zóně, jako jsou selektivní migrace, prostorová diferenciacie bydlení, sociální a ekonomická segregace, stejně jako komerční aktivity a jejich rozšíření v zázemí města, či kolaps geografické hierarchie. Teoretická část podává stručný přehled o procesu suburbanizace, konceptualizace příměstské zóny, následně i o attributech a prostorových formách suburbanizace. Stručně jsou analyzovány i specifika suburbanizace v postkomunistických zemích. Empirická část příspěvku představuje základní suburbanizační procesy v zázemí města Prešova.

Keywords: *suburbanisation, suburban zone, hinterland, Prešov, post-communist towns, intra-urban structures, selective migration, Slovakia*

Introduction

Suburbanisation is one of the main transformation processes that participate in the changes of the spatial organisation of towns, especially their suburban zones, in the post-communist countries. It is the process occurring in the industrial and post-industrial phase of urbanisation. Through this process the rate of urbanisation is growing of areas lying in the suburban zone and spatially separated from the compact town (the core of town agglomeration). The increase of urbanisation results largely from the development of residential areas as a consequence of the immigration of inhabitants from the inner compact town motivated by desire for higher quality of living and healthier environment, being conditioned by technological progress in transport. On the one hand, the residential suburbanisation is followed by the movement of jobs and commercial activities from the town centre and inner city into the suburban zone, and on the other hand, it is accompanied by the rise of

new activities and their permanencies, i.e. commercial suburbanisation, which can at its advanced stage lead to existence of rival marginal towns competing with the original agglomeration. Eventually, the suburbanisation process may end in the change from a mono-centric urban structure into a polycentric one (Matlovič, Sedláková, 2004).

Theoretical – methodological concept of suburbanisation (a brief survey)

According to Matlovič (2001), suburbanisation is a complex transformation process of contemporary post-communist cities. It occurs in all partial structures of the town (morphological, functional, and socio-demographic). Key space for suburbanisation is represented by a so called suburban zone (rural-urban fringe). Reasons for transformation processes in post-communist cities vary in literature. However, most authors agree on two general factors: (1) factor of socio-economic transformation

conditioned by the fall of social regime at the turn of the 1980s and 1990s; (2) factor of globalisation (Matlovič, 2001). The first case concerns the transformation from communist to capitalist city. The process is accompanied by the change of centrally planned economy to market controlled system, changes in private property, ground rent, and democratisation of political life. In the case of globalisation, trends observed in post-communist cities are as follows: internationalisation of investment and labour, deregulation of public sector force, deindustrialisation, technological changes, community polarisation, sustainable development advocacy, and the postmodern way of urban life (Matlovič, 2001). According to Zborowski (2000), a tertiarisation occurs in the centre of big Central European cities (concentration of hotels, financial centres, business) and commercialisation and commercial suburbanisation occurs not far from the centre, around the administrative town limits (hypermarkets, shopping centres). A new space of residential suburbanisation is forming in the suburban zone. Bednář (2003) maintains that the process of commercial suburbanisation in post-communist towns emerges mainly from the transformation and change in the spatial distribution of retail network. Transformation has been realised through price liberalisation, private business opportunities, dissolution of state monopoly, entry of new business entities, privatisation, etc. Transformation appeared with the establishment of the new concept of retail sale – hypermarkets which have brought a radical change into the use of farmland. It mostly concerns land properties at town peripheries. The process of suburbanisation brings the turn of migration from city towards periphery, change in housing structure in town, social segregation, and social stratification. Suburbanisation depends on the size and significance of a town. Most significant signs of suburbanisation could be found around big cities and metropolises. Less significant signs of suburbanisation are to be found also in the vicinity of medium-sized towns.

Suburbanisation development outcomes generally in extensive colonies of family houses built on “green field” in the suburban part of a town. Administratively, this area is not a part of the town but rather of its nearby communities. Eventually, there are changes in the distribution of population between the city and the suburban zone. Central city is losing its population at the expense of its rural hinterland. Residential suburbanisation is followed by commercial suburbanisation characterised by the shift of services, business and manufacture activities to the suburban zone. In some cases, the central city consequently shows stagnation or even decline. In the last decades, a new phase of suburbanisation and a postmodern suburbanisation are observed (Matlovič, Sedláková, 2003). This phase is characterised by the formation of suburban downtowns that are independent from the

core of the city or from the metropolitan area. Suburban downtowns grow mostly owing to cityward flow from other suburban areas (Ouředníček, 2002 in Matlovič, Sedláková, 2003). Besides the typical commercial activities (wholesale, hypermarkets, industrial parks, transport infrastructure) in the postmodern phase of suburbanisation there are also other non-production activities emerging (*high-order business services*) which were until recently dominant in the city (e.g. banking, insurance, economy consultancy, real estate agencies, computer and information services, management and marketing firms, solicitorship, science and research).

Sprawling of towns into their surroundings has various forms. New developing areas might be concentrated around the compact town, but also individually scattered in many small localities and rural settlements in wide town surroundings. Sprawling town creates areas with the developing residential and commercial suburbanisation. Agriculture land is replaced by residential and commercial structures. New residential areas and reconstructed parts of villages are accompanied by growing shopping centres, hypermarkets, supermarkets, stores, and industrial zones. One of the typical forms of spatial growth of towns is so-called *urban sprawl*. Sprawl is typical for US countries. Other suburbanisation forms include *leapfrog development*. It is a non-compact development resulting in individual urban areas separated by an open space. Town expansion into the open country is not rapid and regular, but it spreads haphazardly, making marked and fast steps only in one or few directions; other areas, on the other hand, do not develop or even stagnate. The development goes usually along radial communications leading off the compact town. In that case we speak of *ribbon development*.

The impact of suburbanisation on the example of Prešov hinterland

Suburbanisation has significant economic, social, and environmental consequences. Low density building brings a marked spatial segregation of human activities like living, housing, employment, shopping, etc. Suburban forms of settlement impose higher claims upon energy, time, space, and finance. People living in isolated residential zones are intensely dependent on commuting by their own car to work, school, for services, culture, and entertainment. The high spatial concentration of certain functions and their considerable spatial segregation produce constant transportation flows impacting environment quality. The social impact of suburbanisation is characterised mostly by segregation and selective migration. There are migrations from the central town to suburban zones realized by households with higher social status. Successively, a segregation between the suburban and inner parts of a town may

emerge. Luxurious family houses in rural land are being established almost exclusively by inhabitants with above-average incomes and with academic education. Their social status is in a conspicuous contrast with that of the country's autochthonous population (Sýkora, 2001).

In connection with the impact of suburbanisation on the society, Pahl (1965) speaks of a so-called collapse of geographical and social hierarchies. Instead of rounded bundles of functions at particular hierarchical levels collected at appropriate nodes, the whole process precipitates by population's mobility. Likewise, the

segregation of incoming groups with their links back to the city undermines the traditional social hierarchies of rural areas. Functions and services move towards customers from centre to suburbs. Unexploited land properties remain in inner cities with old industrial deteriorating buildings, and with markedly soil-polluted areas (*brownfields*). Developers prefer *greenfields* for new construction. The purchase of land for development leads to the loss of productive farmland, smaller units, and fragmentation of holdings (Sedláková, 2003).

In the following part of the paper we will describe some of the problems concerning the impact of suburbanisation.

SLOVAKIA



Fig. 1: The geographical location of Prešov and communes in its suburban zone

Selective migration in the hinterland of Prešov

Migrations from central town to suburban zones realized by households with higher social status is generally a typical feature of suburbanisation. The town is distinguished by the fall of migration increase, gradually changing into migration decrease of its population. On the contrary, the hinterland of a town and the surrounding villages notice the inflow of city like immigrants who participate in residential suburbanisation in that area. However, the intensity of migration within the suburban zone is distributed unequally. There is a qualitative and quantitative selection, namely the number of immigrants, their education, origin, and the target area they have

selected. These tendencies are being observed in the hinterland of the town of Prešov as well (Tab. 1, 2).

A recent analysis has shown that the suburban zone of Prešov was in 1996–2003 spatially differentiated in terms of migration increase of population (Tab. 2). Villages with the highest average annual migration increase (over 10%) were Lubotice, Záborské and Petrovany. A rather high migration increase (7-10%) can be identified also in Podhradík, Dulová Ves, Fintice, Velký Šariš, Vyšná Šebastová, and Župčany. Other villages experienced either a less significant migration increase (Bzenov, Haniska, Kapušany, Kendice, Malý Šariš, Rokycany, Ruská Nová Ves, Teriakovce), or even

YEAR	Number of population	Migration increase/ decrease		Natural increase/ decrease		Total increase/ decrease	
		abs.	%	abs.	%	abs.	%
1991	87 475	656	7.5	823	9.4	1479	16.9
1992	88 954	292	3.3	812	9.1	1104	12.4
1993	90 058	100	1.1	805	8.9	905	10.0
1994	90 963	484	5.3	566	6.2	1050	11.5
1995	92 013	168	1.8	506	5.5	674	7.3
1996	92 687	-12	-0.1	472	5.1	460	5.0
1997	93 147	-70	-0.8	384	4.1	314	3.4
1998	93 461	-24	-0.3	353	3.8	329	3.5
1999	93 790	-111	-1.2	298	3.2	187	2.0
2000	93 977	-127	-1.4	208	2.2	81	0.9
2001	92 774	-207	-2.2	122	1.3	-85	-0.9
2002	92 584	-366	-3.9	132	1.4	-234	-2.5
2003	92 375	-471	-5.1	132	1.4	-339	-3.7
total:		312		5.613		5.925	

Tab. 1: The population movement balance in Prešov in 1991 - 2003

COMMUNITY	1996	1997	1998	1999	2000	2001	2002	2003	1996 - 2003
	Migration increase/ decrease (%)								
Bzenov	8.70	7.03	5.55	-1.39	-18.23	-2.74	9.67	0.00	1.07
Dulová Ves	0	17.95	10.70	1.76	-3.51	15.25	6.71	9.98	7.36
Fintice	-5.47	-2.04	10.82	16.58	6.47	11.10	3.06	16.15	7.08
Haniska	7.68	-1.90	15.04	-15.30	7.60	5.33	29.31	-10.53	4.65
Janov	0	-3.94	11.90	0	-15.75	3.61	-7.09	14.49	0.40
Kapušany	13.51	6.20	2.04	-0.50	7.55	11.24	-2.44	3.38	5.12
Kendice	8.20	-4.79	11.52	8.60	12.31	6.16	1.24	0.61	5.48
Lubotice	19.08	3.52	1.74	18.08	8.04	-6.29	46.15	32.76	15.39
Malý Šariš	1.81	5.27	1.68	-6.60	-1.59	-12.42	19.70	16.31	3.02
Petrovany	4.86	19.21	16.61	-6.48	0	14.70	21.75	15.18	10.73
Podhradík	-6.08	6.02	3.05	9.26	-8.93	45.32	5.88	28.65	10.40
Radatice	-8.96	-13.00	-14.27	11.78	1.30	-5.26	-3.96	0.00	-4.05
Rokycany	4.59	3.01	-2.97	-1.45	2.84	0	4.03	-3.96	0.76
Ruská Nová Ves	9.07	-3.38	-10.20	4.41	12.04	6.51	-6.38	6.27	2.29
Teriakovce	5.17	-23.75	-13.30	0	12.95	23.02	2.53	10.05	2.08
Velký Šariš	19.87	0	-30.00	10.17	9.77	6.62	23.10	31.97	8.94
Vyšná Šebastová	8.20	10.09	0	0	3	5.23	19.65	22.91	8.63
Záborské	4.68	2.34	6.94	-2.34	47.40	53.53	26.48	12.17	18.90
Župčany	0	16.55	7.78	-3.39	11.07	7.43	12.37	8.72	7.57
Prešov	-0.13	-0.75	-0.26	-1.18	-1.35	-2.23	-3.95	-5.11	-1.87

Tab. 2: The migration balance between Prešov and its hinterland communities in 1996-2003

Source: Statistical Office of SR

a migration decrease (Radatice). In terms of absolute figures, most people moved to Kanaš¹, Záborské, Kendice, Vyšná Šebastová.

An important factor when identifying suburbanisation and evaluating the selective migration and suburbanisation impact in the hinterland is the origin of immigrants moving to the suburban zone. By the origin of immigrants we mean the place from which the immigrants moved (their former residence). An important and peculiar feature to suburbanisation is in that case a rather

high percentage of immigrants coming from the town of Prešov. The greatest share of immigrants from Prešov (over 70%) shows the commune of Kanaš and the community of Vyšná Šebastová. Other villages with a high share of immigrants originating from Prešov (60%-70%) are Lubotice, Velký Šariš, Podhradík, and Haniska. The immigrants of Prešov origin predominate also in the village of Záborské, Malý Šariš, and Fintice (50%-60%). Immigrants coming from other, mostly neighbouring communities and towns dominate in the remaining part of the area under study.

1) Kanaš – a commune within the administrative area of Velký Šariš. In further analyses we will concentrate only on Kanaš, not on the town as a whole.

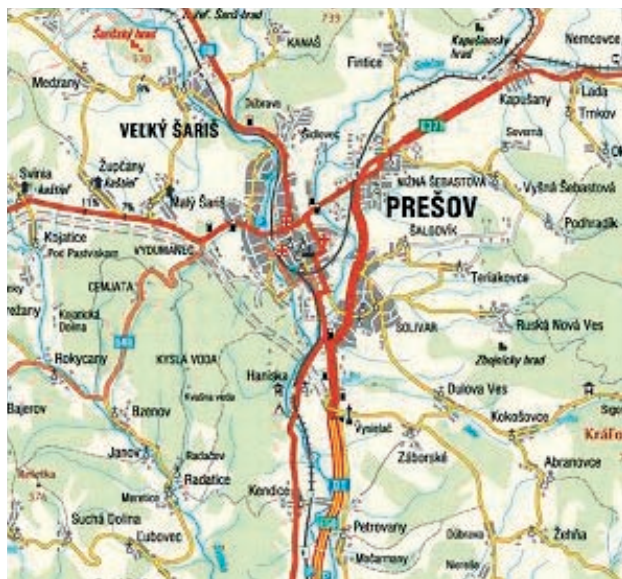


Fig.2: The town of Prešov and its hinterland

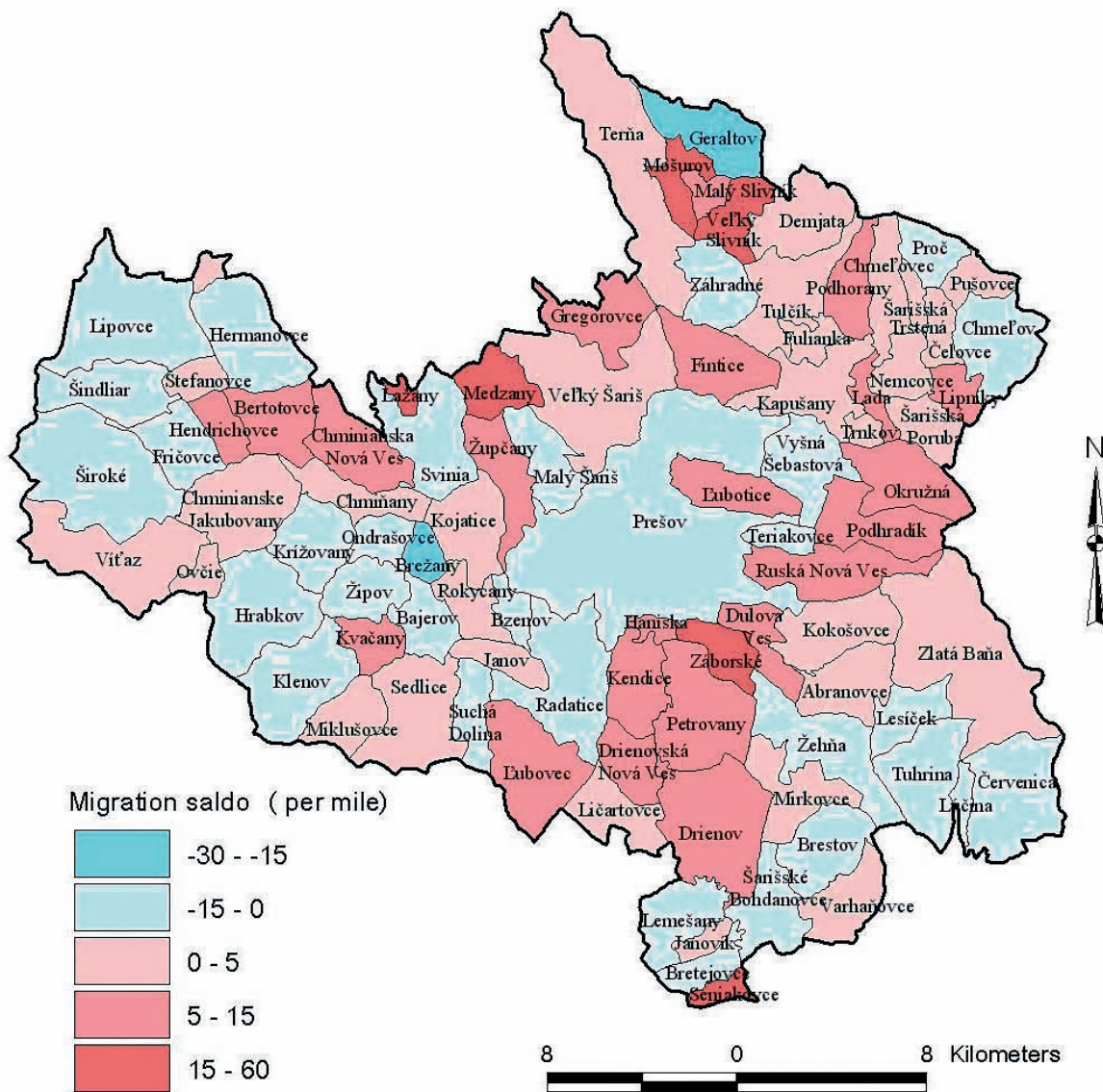


Fig. 3: The balance of migration within communities of the Prešov district in 1996-2004

The social structure of population movement has been studied on the basis of migration characteristics, since no more detailed data were available at the moment. It

would be also useful to take into account data concerning the economic structure and the financial situation of residents. This would also help to even closer specify the

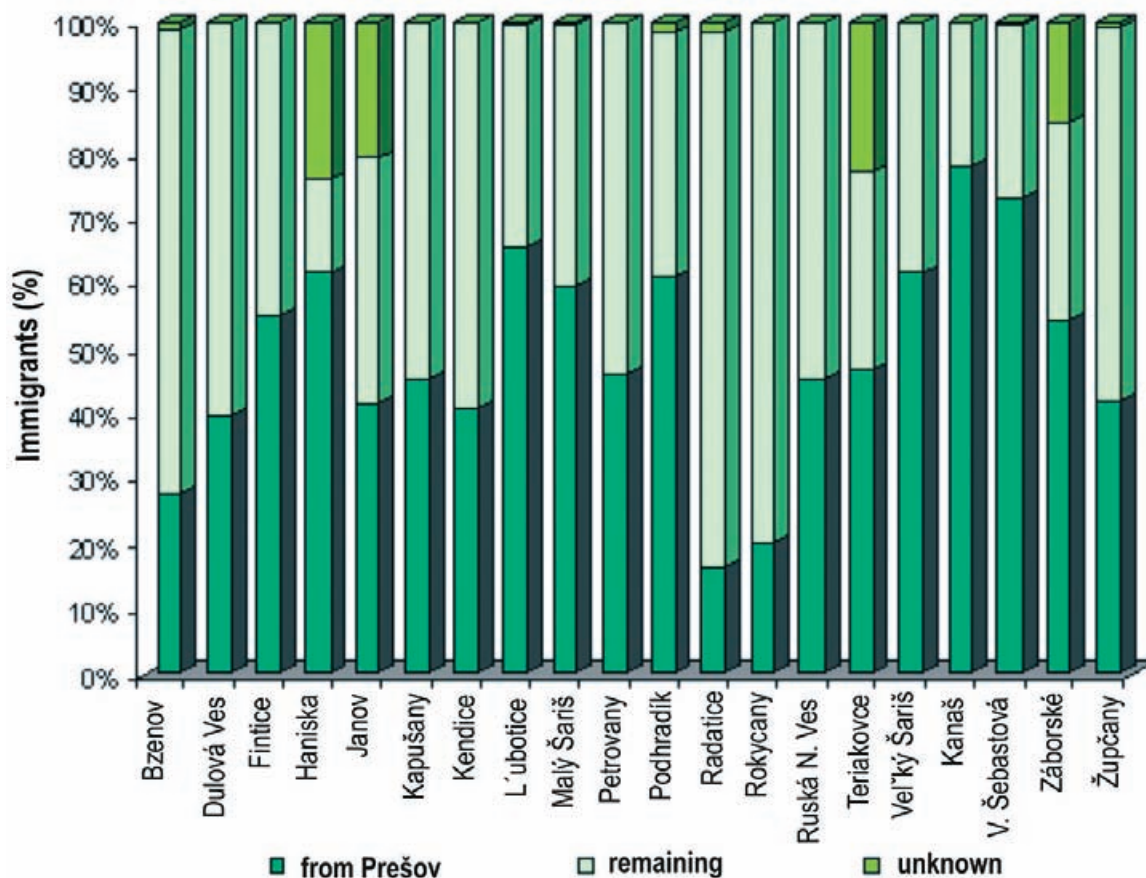


Fig. 4: The origin of immigrants coming from selected communities of the Prešov hinterland (1991-2002)

areas with the developing suburbanisation, which will be the goal of a further research.

Contrast in the population's education structure in the Prešov hinterland

Education of immigrants is another factor that contributes to social disparities among people in the suburban zone. People moving from the inner town to peripheries are usually of a higher social status, their education being mostly academic. Gradually, a significant contrast may grow between people from the inner town and its periphery. Within our research area of Prešov and the town's surroundings we have identified communities which recorded a significant increase of inhabitants with academic education emigrating from Prešov in the last years. Suburbanisation is quite well developed in these communities.

In 1991, the highest shares of highly educated inhabitants were recorded in Lubotice (6.7%), Haniska

(5.2%) and Velký Šariš (4.2%). A rather low percentage of people with academic education was found in Janov, Podhradík, Rokycany, Radatice, Teriakovce, and Záborské (Fig. 5a). The situation changed at the end of the 1990s. Several communities come to the fore, the number of people with academic education is growing there rather markedly (Fig. 5b). Significant changes in educational structure, especially the growth of highly educated people, were identified in Lubotice, Podhradík, Haniska, Vyšná Šebastová, Záborské and the town Velký Šariš with its commune of Kanaš.

Spatial differentiation of housing in the suburban zone, solitary residential areas with above-standard housing

The process of residential suburbanisation brings a certain differentiation of living and housing in the town hinterland. The process does not develop evenly in all directions, but there is a qualitative selection. People coming from the town prefer a quiet, tranquil and

Fig. 5a: Year 1991

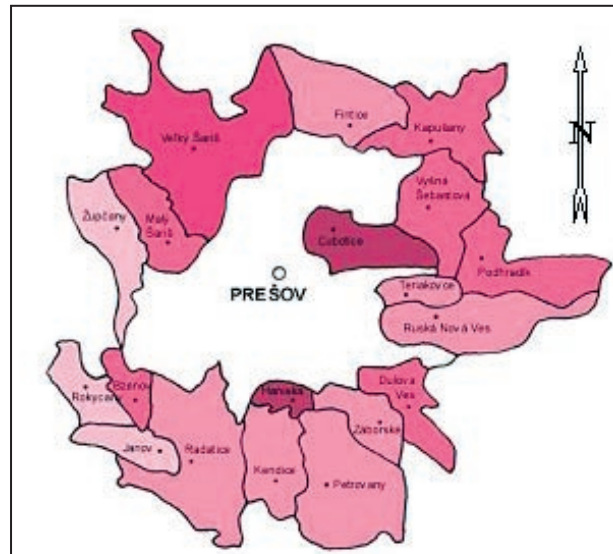


0 2 4 6 8 10%



Share of inhabitants with academic education

Fig. 5b: Year 2001



Figs. 5a, 5b: Development of the share of population with academic education in the hinterland of Prešov in 1991-2001.

healthy environment with an easy access to the city and with a high-quality infrastructure. The new residential areas are characterised by a specific architectural style - mostly family houses, villas, houses built to order and above-standard houses. We have identified such constructions and areas in the commune of Kanaš in the town Veľký Šariš, Záborské, Lubotice, and Teriakovce (Figs. 6-10 – see cover p. 3). In the near future it is possible to identify the suburbanisation processes (with reference to the number of building permits and structure of builders – Fig. 11) also in Vyšná Šebastová, Teriakovce, Malý Šariš, Kapušany, and Fintice. In terms of spatial form, it is a dispersed development accompanied by the construction of solitary objects on the open land in the above communities. Another spatial form of residential suburbanisation in our area is a leap-frog development, which has a character of smaller clustered family houses separated from other compact areas by unbuilt open lands. Allochthonous inhabitants strongly contrast with autochthonous people and create spatially and socially isolated zones within or at the periphery of the community. Immigrants from the city bring with them the urban way of life, intensely bound to the city both in terms of work and recreation.

Commercial suburbanisation and its impact in the hinterland of Prešov

As we have already mentioned, residential suburbanisation is followed by the movement of new jobs and commercial

activities from the centre and inner city into the suburban zone. This is accompanied by the rise of new activities and their permanency, i.e. commercial suburbanisation, what can in its advanced phase lead to the development of rival marginal towns competing with the original agglomeration. Eventually, the suburbanisation process may end in the change from monocentric urban structure into polycentric one. Commercial areas such as shopping centres, hypermarkets, supermarkets, department stores, warehouses, industrial objects, car services and car stores, and services of various character nowadays follow the trend of suburban development, concentrating along the important transport communications, slip roads and railways and leaving the central city. Commercial areas are distributed unevenly and sporadically on greenfields. They take and fill the areas formerly exploited by agriculture. The model of such a suburban development is slowly emerging also in the hinterland of Prešov. There are several areas with the concentration of commercial objects in this town, whose highest density is observed along main roads leaving the city: international communications E 50, 1/68, highway D1 Prešov – Budimír (community 11 km NE from Prešov), and 1st class road No. 18 with the following streets: Bardejovská, Duklianska, Košická, Levočská, and Petrovanská (see Figs. 12, 13).

However, the processes of commercial suburbanisation in the town of Prešov are of lesser significance and their impact is therefore rather low, too. Some persisting

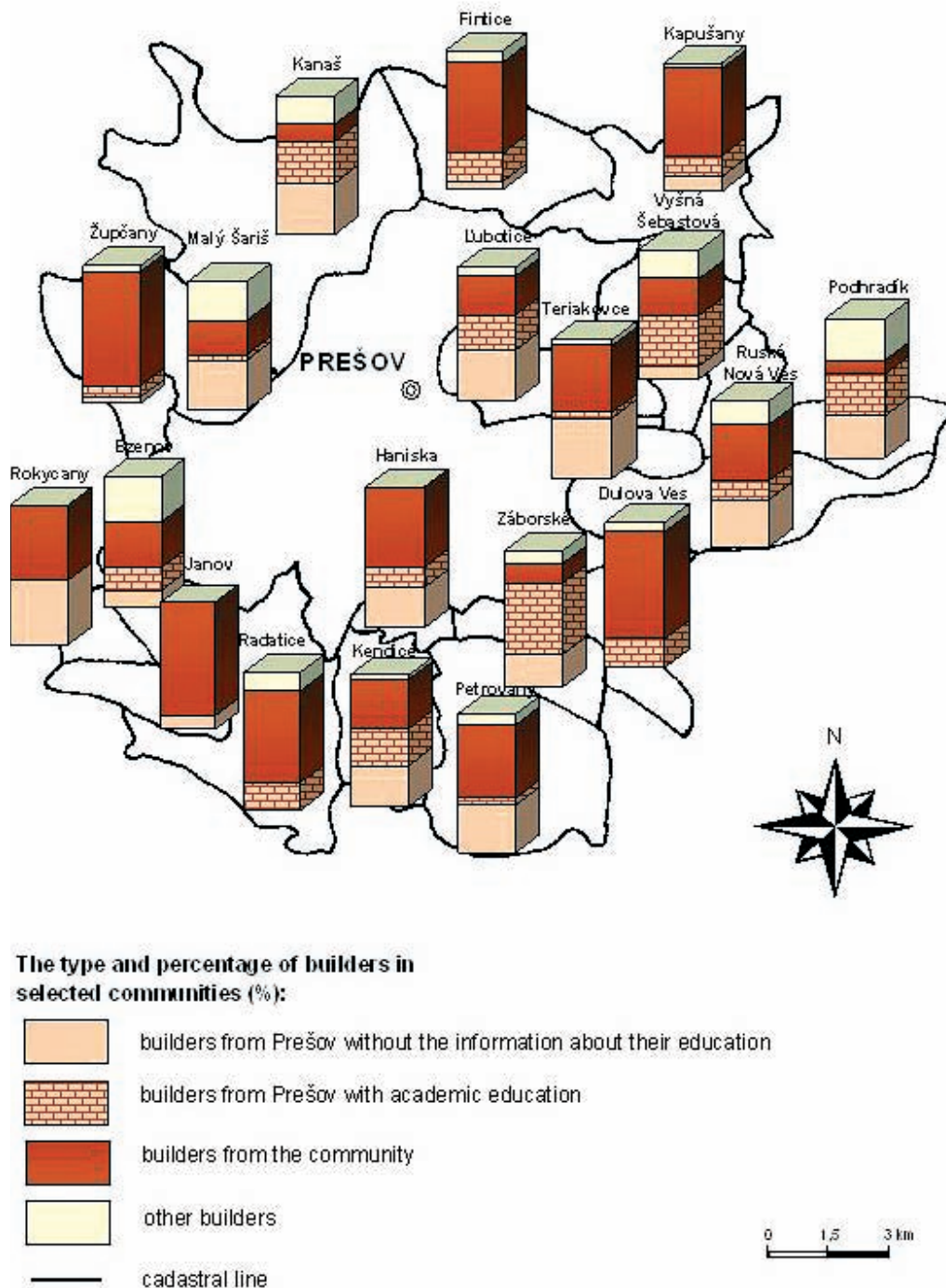


Fig. 11: Builder types and percentages in selected communities (%)
 Author: A. Sedláková

problems are seen in unregulated development, land fragmentation, high heavy trafficked roads, impersonalization, and many others. In the Prešov area there are many commercial objects situated not exclusively along the important communications, but they can be also found in housing estates and near the centre (e.g. Kaufland in the housing estate of Sídliško III., Billa in the housing estate of Sekčov). On that account we state the opinion that the commercial suburbanisation in the hinterland of Prešov is now in its initial phase of development.

Conclusion

Suburbanisation is one of the main transformation processes that participate in the changes of the spatial organisation of towns, especially their suburban zones, in the post-communist countries. The process is characterised by the development of residential areas q.v. the result of immigration of inhabitants from the inner compact town motivated by the desire for higher quality of living and healthier environment, and is conditioned by the technological progress in



Fig. 12: Supermarket Baumax in the hinterland of Prešov
(Photo A. Sedláková)



Fig. 13: Supermaket Kaufland in the hinterland of Prešov
(Photo A. Sedláková)

transport. The residential suburbanisation is followed by the commercial one. There are two general factors for the transformation processes in post-communist cities according to the majority of authors: the factor of socio-economic transformation conditioned by the fall of social regime at the turn of the 1980s and 1990s, and the globalisation factor. Suburbanisation has significant economic, social, and environmental consequences. Low density building brings a considerable spatial segregation of human activities such as living, housing, employment, shopping, etc. High spatial concentration of certain functions and their considerable spatial segregation produce constant transportation flows which impacts the quality of living environment. The social impact of suburbanisation is characterised mostly by segregation

and selective migration. Luxurious family houses in rural land are being established almost exclusively by inhabitants with above-average incomes and academic education. Commercial areas are distributed unevenly and sporadically on greenfields. They concentrate along important transport communications, slip roads and railways leaving the central city. They take and fill the areas formerly exploited by agriculture. However, the processes of commercial suburbanisation in the town of Prešov are of less significance, therefore their impact is rather low as well. To conclude, as many authors say, it is impossible to stop the process of suburbanisation therefore it is inevitable to take measures for its controlled development.

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METHODOLOGY OF THE EVALUATION OF THE GEOGRAPHIC POTENTIAL FOR TOURISM IN THE PLZEŇ REGION

Marie NOVOTNÁ

Abstract

This article describes the methodology based on a geographic information system (GIS), that was developed in order to map the geographic potential of tourism. The methodology comprises four stages: (1) appropriate variables to evaluate the potential for tourism were chosen, (2) chosen prerequisites were processed into map layers, (3) the geographic objects were evaluated by the Delphi method, (4) general evaluation of the potential for tourism was processed using the method of map algebra – GIS analytical procedures. The work output is a map describing the spatial range and the size of tourism potential in the chosen region. The approach is demonstrated on the Plzeň region.

Shrnutí

Metodika hodnocení geografického potenciálu pro cestovní ruch na příkladu Plzeňského kraje

V tomto článku je navržena metodika hodnocení geografického potenciálu pro cestovní ruch založená na použití geografického informačního systému (GIS). Zpracovaný přístup zahrnuje čtyři kroky: (1) byly vybrány vhodné proměnné pro ohodnocení potenciálu pro cestovní ruch, (2) vybrané předpoklady byly v konkrétním území zpracovány do prostorové databáze, (3) objekty z prostorové databáze byly ohodnoceny metodou Delphi, (4) celkové ohodnocení předpokladů pro cestovní ruch bylo zpracováno pomocí mapové algebry - analytických procedur GIS. Výstupem práce je mapa zobrazující prostorový rozsah i velikost potenciálu zvoleného území pro cestovní ruch. Přístup byl demonstrován na území Plzeňského kraje.

Key words: *Geographical potential, tourism, GIS, map algebra, Delphi method, Plzeň region, Czech Republic*

1. Introduction

One of important topics studied by socio-economic (human) geography is landscape potential. The term is comprehended as a capability of all landscape components to meet various needs of the society. The landscape is used by people a lot, some of its components support human activities, some components limit them. The system of the landscape has a different potential for different activities. It is therefore necessary to evaluate the potential for a concrete activity. We evaluated its potential for tourism for a publication „The Potential Development of the Plzeň Region“ (2005), that was published by the Department of Geography, the West Bohemia University in Plzeň. For evaluating this potential we used a methodology based on GIS technologies and experts' opinion. The methodology is discussed in the following text.

The potential of landscape for tourism is expressed by the capability of the area to provide good conditions

which would allow the development of tourism (Mariot, 1983). The capacity of landscape potential for tourism is defined as utilization of all resources for tourism available in the specific region. Mostly we search the potential of the landscape for specific forms of tourism (such as water sports, down-hill skiing, hiking). In our study we focused on the most common forms of tourism that can be realized in the region under study.

It is possible to generalize the qualitative and quantitative characteristics of landscape natural and socio-economic potentials for tourism, and the method can be therefore used to evaluate other landscape potentials as well.

2. A Survey of Previous Research

Several works in the past dealt with the evaluation of conditions for tourism development. It is necessary to mention especially the comprehensive work by Dohnal et al. (1985) called “Rajonizace cestovního ruchu”

(Regionality of the tourism), enlisting tourist regions in the Czech Republic.

Several methodologies were elaborated to evaluate the landscape potential for different activities of tourism. For example Kliskey (2000) evaluates mountain areas in Canada that are suitable for development of snow scooter riding.

Other authors dealing with the potential for tourism were Míchal, Nosková (1970), Bína (2002), Vepřek (2002), Rost and Klufova (2003). The publication „Processing of the issue of tourism“ is one of most recent ones. All these works are based on spatial units evaluation – municipalities (e.g. Bína 2002), or on regular forms – squares, that cover the area of interest (e.g. Vepřek, 2002). Natural conditions (climate, morphology, terrain, intensity of insolation, snow conditions, geomorphological conditions, proportional representation of different landscape elements, natural attractions) or urban conditions (civic facilities for tourism, traffic infrastructure and accessibility, facilities for housing, sports facilities, cultural and historical attractions, hiking routes, cycling routes) are evaluated in these spatial units (Vepřek, 2002). Also, specific prerequisites for concrete tourism activities on a concrete area are being discovered.

According to Bína (2002), „there are three main forms of localization conditions for tourism: firstly, it is the landscape suitability for a specific activity of tourism (mainly related to environment, e.g. natural conditions favourable for cycling, winter sports, mountaineering etc.). Secondly, a municipality must be in some way attractive for tourists (cultural and historic sights, museums, out-door museums etc). Third form is the kind of attractiveness due to various cultural, sports and other events that may draw visitors. A level of rigidity and time permanency of localization conditions for tourism decreases from the level one to the level three“.

J. Vystoupil (1981) dealt with the rating of recreational potential in his dissertation work. He used some similar indicators, especially the natural potential and the cluster method. J. Vystoupil et al. (2006) published the Atlas of tourism, which is the most complex work of this kind in our country; it was very beneficial for our work with respect to methodology.

Most works use experts' opinions to evaluate the localization prerequisites. The experts make comments upon both qualitative and quantitative characteristics of these prerequisites. Complete potential is created when all different forms and types of prerequisites are put together. Areas with the same type of potential create the regions of the same type.

Apart from Vystoupil (1981), all methods consider only those preconditions that are presented in a particular unit and then calculate a whole potential of the landscape (territorial administrative units or squares of raster). The potential does not cover those which are not presented in the unit, but are spatially nearby. However, these spatially close prerequisites can increase the potential for tourism for the place that is researched.

3. Method

The development of tourism and recreation is typically a multi-layer and multi-source process, influenced by practically all components of the landscape sphere (natural factors as well as socio-economic activities). To simplify it we can determine 12 criteria (Kolektiv, 1999). Their status can affect the development of activities or forms of tourism both directly and indirectly:

- Morphology
- Climate
- Forests
- Surface waters
- Environment – impact of anthropogenic activities
- Architecture and historic values, natural sights, balneological function of the area
- Places of significant cultural and sports activities
- Sports facilities
- Civic facilities
- Technical infrastructure
- Transport infrastructure
- Transport accessibility from outside

Natural attractions for recreation and sports are defined by the factor of **landscape altitudinal segmentation**. The greater is the landscape's segmentation, the greater is its attractiveness for most forms of tourism. Lowlands or flat areas have a lower potential for tourism than highlands, hilly lands or mountains (Ježek, 2003). The statement however does not apply in general terms; other landscape characteristics must be considered, too.

Other factors influencing tourism that must be considered are **forests, climate** and the number of **lakes, streams and rivers**. The more forests are in the landscape, the more attractive for visitors the landscape is. Climate can influence the typology of recreational activities. In the observed area (the Plzeň region), the climate differences influence especially the possibility to use the landscape for winter sports (down-hill skiing or cross-country skiing). More detailed climate differences are not important for our observed region that is why we do not include them in our evaluation. The existence of standing and flowing water brings possibilities for water recreation and water tourism.

The above mentioned factors could be quantified in different perspectives and might be a bit subjective anyway.

Another factor that is influencing the potential of tourism is the **landscape aesthetics**. It is, however, impossible to measure it scientifically. The evaluation is based on how most people perceive the four types of landscapes. The highest value is generally attributed to hilly landscapes of lower density with forests, meadows and water surfaces. However, some plains or lowlands with a specific composition of water surfaces are very aesthetic, too (for example the Třeboňská pánev Basin). „Typical Bohemian and Moravian landscapes with scattered seats, towns or villages, with a mosaic of forests and fields, get medium values of the landscape aesthetics. Lowlands and undulating country with a higher share of arable land get relatively the lowest values on this scale.“ (Kolektiv, 1999).

Very complex factor is the **environment**. It is usually divided into two components: communal hygienic and landscape-urban. With respect to the previous factor which was dealing quite a lot with the second component, we will now discuss only the hygienic quality of the environment, which is anyway „the key factor in the evaluation of environment“ (Kolektiv, 1999). Considered will be the following indicators: air pollution (ash, sulphur dioxide), pollution of ground waters and ground traffic noise.

Another important factor for the evaluation of tourism potential is **the concentration of the objects of significant historical, architectural and cultural heritage and localizations of natural or technical objects of interest**. This factor influences many recreational

activities and stimulates the cultural-cognitive form of tourism. This factor can be evaluated by the density of these objects per square unit and/or by the demarcation of areas where they are unusually concentrated.

Similarly, the places of **significant cultural and sports activities** including sports facilities influence positively the development of tourism. These factors are important especially in two recreational activities – sojourn recreation or when people shortly visit a place for some sports or cultural event. Again – a density map of these objects could be created.

The last four factors – **civic facilities, technical infrastructure, transport infrastructure and transport accessibility** from outside, are factors of realization and they can vary. This work does not evaluate them.

Total potential of the area is aggregated from the above mentioned prerequisites. These general prerequisites were pointed as a set of concrete objects in the landscape. Then a database of these objects was made and they were then processed into digital topical map objects as following:

- points (four layers – locations of important mineral resources; objects of historic, architectonic or cultural significance; interesting locations in nature; locations with sports facilities, where sports and cultural events take place),
- lines (one layer – water courses used for recreation),
- surface – (six layers – digital model of terrain with sloping surfaces; aesthetically valuable areas; important forest areas; areas diversified according to hygienic environmental quality; areas for winter sports and water surfaces for recreational purposes).

	Prerequisites for tourism	typology of components	values
1.	hygienic quality of environment	polygons	0, -1, -2
2.	differences of the landscape according to sloping surfaces	polygons	1 – 5
3.	forests	polygons	1 – 5
4.	climatic prerequisites – snow more then 90 days per year, average temperature under 0°C in winter time (3 months)	polygons	1 – 5
5.	aesthetically nice landscape (large protected natural areas and natural parks; other territories)	polygons	1 – 5
6.	dams and ponds for recreation	polygons	1 – 5
7.	water courses for water tourism; fishing territory	lines	1 – 5
8.	mineral waters, peat utilized for therapeutic purposes	points	1 – 5
9.	natural showplaces, outlook towers and view places, national-historic objects (castles, church buildings, archeologically and historically interesting places, urban and rural reserves and zones, folk architecture, technical sights, birth places of celebrities, museums and out-door museums, galleries, ZOO, botanic gardens	points	1 – 5
10.	farms providing services – horse riding training, sports infrastructure – ski lifts, ski schools, mountaineering terrains, golf courses, airports with flight services, elevated locations with appropriate sites	points	1 – 5
11.	church objects with pilgrimage places, places where cultural events take place – theatres, concerts, festivals, folk festivals, locations with appropriate infrastructure to organize festivities, places where sports events take place	points	1 – 5

Tab. 1: Forms of tourism
Source: own elaboration.

The layers are described in Tab. 1.

We used the Delphi method to evaluate the quality of individual prerequisites. This method consists in repeatedly asked questions which are answered by experts. The purpose of the first part of the research is to gather the experts' opinions. These opinions are then categorized and evaluated. After that, the results are anonymously returned back to the experts, who are asked to evaluate the ordered results again. They are allowed to change their opinion in this second part. We addressed five experts, who know the Plzeň region very well. We provided the created databases of prerequisites and maps with objects locations. We asked them to make a significance order of these explicitly defined objects according to this scale: 5 – very high, 4 – high, 3 – average, 2 – low, 1 – very low. The respective objects in all layers we marked with the most frequent value according to the experts' opinion in this second part of the research. Two topics were the only exception: firstly the topic of hygienic quality of environment (with scale 0 – no ecological pressure, -1 or -2 areas under ecological pressure of different intensity). Secondly, the vertical diversification was evaluated

differently: plains were marked with 1 and the most morphologically diversified surface was marked with 5.

The evaluated layers were processed into the raster format. One square kilometre for all layers was defined as a size of one „cell“ (pixel). Polygons and line forms were converted directly from vectors to rasters. The cells of the raster covered by polygons got the value of these forms, similarly the cells of the raster that the lines went through, got the values of the lines. The raster surfaces were created from the point layers of evaluated objects (layers 9 – 11). When calculating all, we used a method of the kernel-smoothing: the value of the cell was calculated from the points that had been 5 kilometres from the centre of the cell. Different points make the final value of the cell depending on how far they are from the centre of the pixel. Then we used a map algebra calculation. The highest mark of the points in the respective place was finally associated with each pixel.

We used the map algebra operations to finalize the evaluation. After seven raster layers (layers 2 – 8 in the Tab. 1) were aggregated and the figure divided by seven, we obtained the potential of the natural environment (Fig. 1).

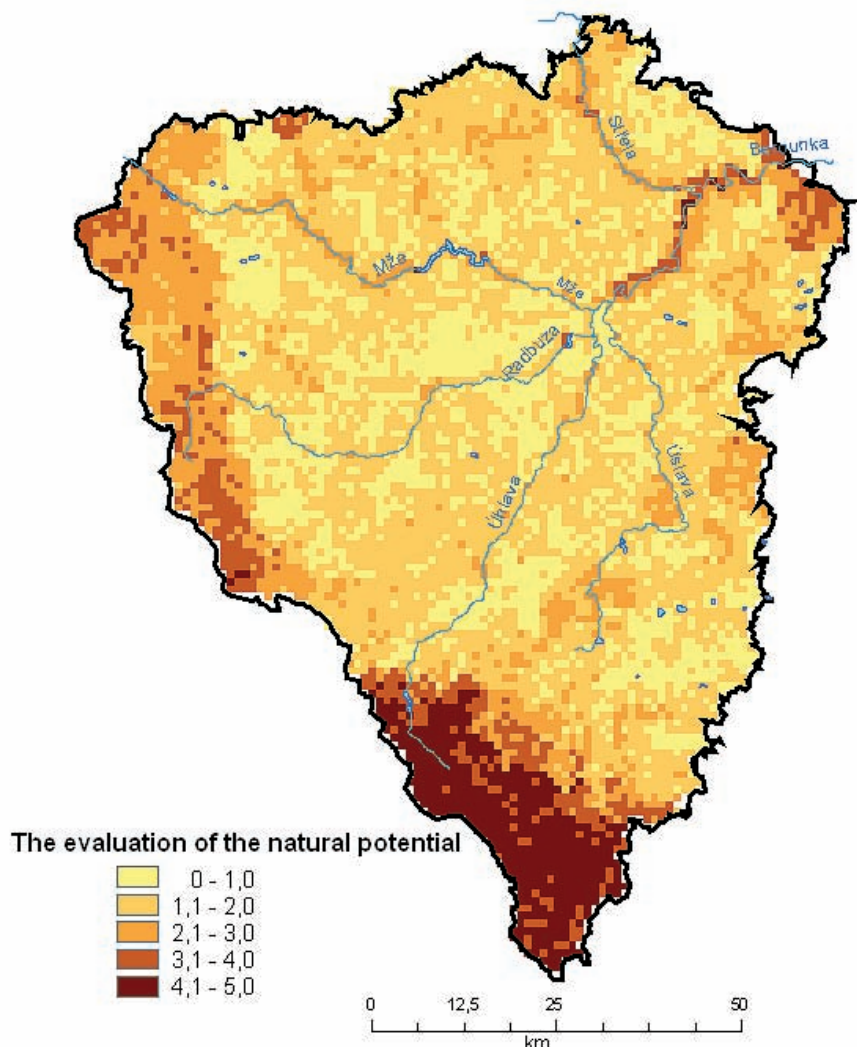


Fig. 1: The potential of natural environment for tourism in the Plzeň region
Source: own elaboration

Total potential of tourism we obtained when we added the figure of the surfaces with evaluated points and subtracted the figure of the surface of hygienic quality of the environment (Fig. 3).

Out of the point figures (layers 9 – 11) we created a density map of tourist attractions: we aggregated surfaces made of layers 9 – 11 and a total value of the cell was divided by the size of the cell (Fig. 2).

4. Data basis for the potential of tourism analysis

„The quality of spatial analysis results depends especially on a good quality of the database and on adequate processing methodology. The fundamental database of

spatial analysis is a digital spatial database containing information about the landscape“ (Voženílek, 2001).

Digital model 1:25 000 (DMU 25), digital database ArcČR 500 and topical digital maps from the Czech Hydrometeorological Institute (air quality assessment) became fundamental data sources for an analysis of the tourism prerequisites. The digital terrain model (DTM) was created on DMU 25. Then, through this DTM a morphological diversity was evaluated. We used landscape cover from ArcČR 500 and determined the main forest complexes. The other spatial information were taken from the Plzeň region's geographic information system developed in the department of geography. The list of topical layers created is presented in Tab. 1.

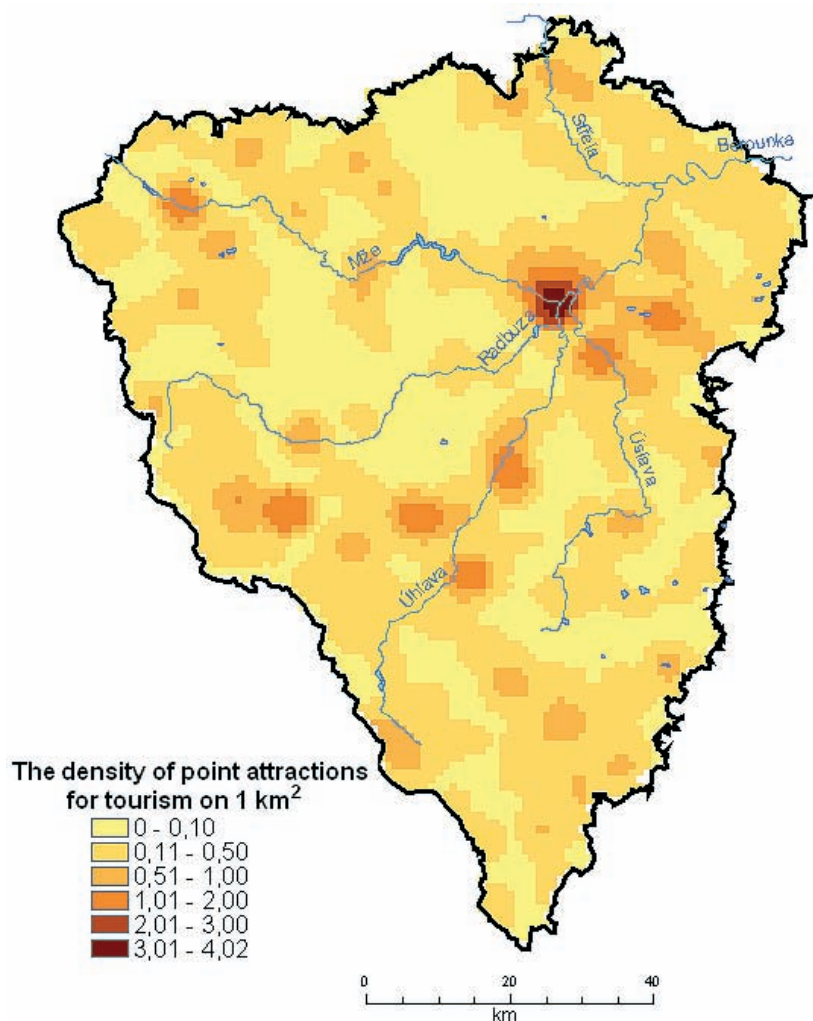


Fig. 2: Aggregative potential for tourism in the Plzeň region

Source: own elaboration

5. Results

In terms of natural environment in the region, a maximum value of the raster cell is 4.8 with an average regional value being 2.2. The map algebra processing allows to get maximum and average values immediately as well as territory percentages for the respective values of significance (Tab. 2).

The regions of Šumava Mts., Český les Mts. (Bohemian Forest), Brdy Mts. and the area downstream the Berounka R. beneath Plzeň exhibit the highest natural potential for tourism, while the hilly region of the drainage divide of Mže R., Radbuza R., Úhlava R. and Úslava R. mostly used for farming shows the lowest potential. The difference is illustrated in Fig. 1.

Significance value for tourism	% of the territory
Very low (0 – 1 point)	27.2
Low (1.1 – 2 points)	45.2
Average (2.1 – 3 points)	15.5
High (3.1 – 4 points)	6.1
Very high (3.1 – 4 points)	6.0

Tab. 2: Territory division according to the significance value for tourism
Source: own elaboration

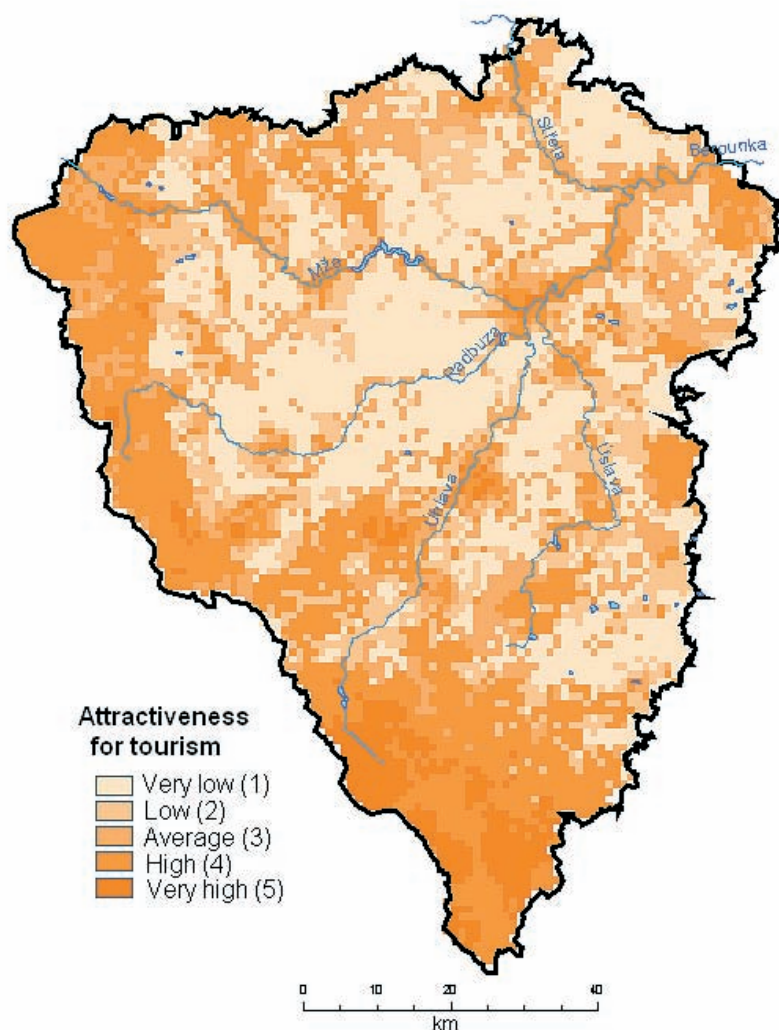


Fig. 3: Aggregative potential for tourism in the Plzeň region
Source: own elaboration

The evaluation of the point prerequisites was based on the calculation of tourist attraction density. An average density is 0.24 points per square kilometer. Tab. 3 shows percentages of density differences in the area.

The highest concentration of tourist attractions is in the surroundings of the towns of Plzeň, Domažlice and Klatovy. Differences are shown in Fig. 2.

Density per square kilometer	% of the territory
0 - 0.10	36.4
0.11 - 0.50	51.6
0.51 - 1.00	9.2
1.01 - 2.00	2.4
2.01 - 3.00	0.2
3.01 - 4.02	0.2

Tab. 3: The density of attraction points for tourism
Source: own elaboration

The average of the whole potential for tourism in the Plzeň region is 2.3 points. Almost 35% of the area has a high potential for tourism (see Tab. 4). The potential distribution is displayed on Fig. 3. High potential is

concentrated in the mountain areas and along the rivers, the lowest potential is in the hilly areas north and west of Plzeň.

Significance	% of the territory
Very low (1)	11.5
Low (2)	36.9
Average (3)	17.0
High (4)	29.6
Very high (5)	5.0

Tab. 4: Area division according to aggregative potential for tourism
Source: own elaboration

6. Conclusion

In this article we attempted to evaluate the area potential for tourism. We used a methodology based on experts' opinions of preconditions for tourism, and analysing and processing of these data by GIS. The experts' evaluation was made by Delphi method. We evaluated the potential for the whole Plzeň region because the spatial database of tourism prerequisites had been created prior to this analysis. The number of analysed prerequisites was, however, limited by the choice of experts. This methodology could be used as

well for evaluating the potential of specific activities in the context of tourism or other economic activities (e.g. agriculture).

This method is a good way to assess the potential of a particular area, it enables to get immediately the average, maximum or minimum values of the potential, and a percentage allocation of different potential levels in the territory. The graphic outcomes can be a foundation for discussion about what steps to take to develop the area.

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CROSS-BORDER REGION KRÁLÍKY - MIĘDZYLESIE

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Abstract

The situation of the cross-border region Králíky / Międzyzlesie (Czech – Polish border) is analyzed in this article. The objectives are to examine a common perception of the region, which has some physical as well as historical foundation. The region is peripheral to both Polish and Czech sides. Its population was almost completely changed after World War Two, and the level of qualifications is not high. Climate and soils are not conducive to agriculture. This peripheral geographical position results in a lack of investments. The region entertains some hope for the future with the development of tourism, with improvements in technical infrastructure as one of the preconditions. Tourism need not be the only direction for development, however, as agriculture is important at least for the maintenance of landscape. The local industry is suitable in creating jobs for people with corresponding qualifications. From a cultural point of view, it would be important to maintain existing educational services. It would also be advisable to localize various social services in the region such as houses for seniors.

Shrnutí

Přeshraniční region Králíky-Międzyzlesie

Příspěvek se zabývá problematikou přeshraničního regionu Králíky - Międzyzlesie (česko-polská hranice). Je zaměřen na společnou percepci regionu, který je podobný nejen fyzicko-geograficky, ale má částečně i společnou historii. Region je periferní jak z polské, tak z české strany hranice. Obyvatelstvo bylo v tomto regionu téměř kompletně dosídleno po 2. světové válce. Jeho kvalifikační struktura není vysoká, klimatické a půdní podmínky nejsou pro zemědělství příliš příznivé. Periferní geografická pozice je příčinou nedostatku investic. Region vkládá naděje do budoucího rozvoje cestovního ruchu, který je podmíněn zlepšením technické infrastruktury. Jen na rozvoji cestovního ruchu však nemůže být postavena prosperita území. Přinejmenším pro údržbu krajiny je nutné zachování určité úrovně zemědělství. Udržení místního průmyslu je důležité z hlediska tvorby pracovních příležitostí pro lidi s odpovídající kvalifikací. Z hlediska kulturní úrovně obyvatel je třeba udržet existující vzdělávací instituce. Vhodné by bylo i umístění různých sociálních služeb, například domovů důchodců.

Keywords: cross-border region, periphery, regional development, Králíky, Czech Republic, Międzyzlesie, Poland

1. Border region, borderland geography

The issue of the state border in traditional geography was usually connected with the issues of border delimitation or with the political and geographical aspects of state borders. In this sense the issue of state borders belonged in the discipline of political geography.

The issue of state border delimitation is however not too much up-to-date in the contemporary European geography. The geographical borders are more or less stabilized and there is a general consensus that the issue is not to be opened. Another question is the state border character, the impact of state borders on the social and economic situation of borderland regions and the perception of state borders. In this sense Europe has been experiencing essential changes that will continue

in the future. The 1990s saw the unification of Germany on the one hand and on the other hand the disintegration of the Soviet Union, Yugoslavia and Czechoslovakia. The process of European integration results in a rapidly changing character of state borders which are not any longer physical barriers to be crossed only with difficulties and ever more become an administrative limit of a certain psychological and cultural significance.

Geography has responded to this new situation. Changes of state borders in Central and Eastern Europe have given rise to a sub-segment of geography which can be called borderland geography (e.g. Grimm, 1995, 1998; Ravbar, 1999; Haase-Hudseljak, 2000; Bufon, 2001; Hardi, 2005, in Czechia e.g. Jeřábek, Dokoupil and Havlíček, 2004). The topical character of studying the borderland regions with respect to globalization processes and changes in

the significance of state borders is emphasized also in Western Europe (Anderson, O'Dowd, 1999). Another impetus to study the role of state borders was the change of their character in connexion with the enlargement of the European Union (Gorzelak, Jałowiecki, 2002).

One of serious problems of border regions is marginality. Marginal means standing on edge. The term can have two meanings in geography. It is either a pure expression of location – in this case marginal would be first of all used for borderland regions, or a comprehensive expression of location and significance – in this case marginal can be also used for inland regions while highly advanced borderland regions need not be marginal. Some authors use other terms such as peripheral or structurally weak regions (Danielczyk, 1998). The definition of marginal region differs in social sciences (Cullen, Pretes, 2000). In geography it is usually related to the centre/periphery concept. It follows that it depends on concrete conditions and on the scale of analyses.

Knox and Marston (2001) classify regions into core, semi-peripheral and peripheral. Core regions are dominated by business, control of most advanced technologies and high labour productivity. Peripheral regions are characterized by dependent and unfavourable business relations, by more primitive technologies and by narrowly specialized economy with a lower level of productivity. The core can grow only if the resources are withdrawn from the periphery whose market is under its control. Globalization has opened the scissors between core and periphery. At present the core's dominance over the periphery is not maintained by force but rather by economic and political tools. The issue of marginal regions can be also found in for example Leimgruber (1998) and in other authors.

Knox and Marston have in mind a global scale where the differences between developed and developing countries are quite obvious. It can be assumed however that analogical characteristics apply for the relation between core and periphery also in the relatively small Czechia. Even in such a small country the hierarchically graded cores control the commercial sphere through politics, concentrate advanced technologies through the connection with science and research, their products being therefore of a higher added value. On the other hand, the economy of peripheral regions concentrates on more traditional manufacturing industries. Economic and political instruments, lobbying and approach to contacts and information are preferred by core regions while the tools of regional policy strive for at least a little improvement of the unfavourable conditions of marginal regions.

Friedlein and Rudenko (2002) warn about the relativity of marginality in post-Soviet and post-socialist countries because in their conditions marginal cannot be identified with rural. Peripheral regions in the Czech Republic were specified by Marada (2001) on the basis of a statistical analysis and in Slovakia the issue was tackled by Pašiak, Faltan, Gajdoš as far back as 1995. The problem of looking for regional disparities on a national scale (e.g. Štika, 2004) has in Czech conditions usually a disadvantage of not descending below the level of districts. The reason is among other things exactly the use of statistical data which are more readily available for districts than for micro-regions. At this level, peripheral area appears quite logically to be little marginal (Hampl, 2000). The micro-regional level of the phenomenon in Czechia was studied by Jančák (2001). Important are also works dealing with the empiricism of individual rural borderland regions (Věžník, 1997; Zapletalová, Strachová; 1999, Vaishar et al., 2000; Vaishar, Zapletalová, 2005).

Studies made in border regions from a viewpoint of one country are valuable but cannot cover the entire range of problems. The picture should be combined with a view from the other side of the border. A certain suggestion was offered in a study dealing with euroregions (Peková, Zapletalová, 2005) but in the end the work puts the centre of attention on the analysis of the Czech side of the borderland, too. The objective of this paper is therefore to analyze the issue of the Czecho-Polish borderland micro-region of Králíky-Międzyzlesie which is marginal on both sides of the state border. We attempt at a relatively complex view of this area with an ambition to also tackle some possibilities of a more intensive cross-border cooperation.

2. Specific features of the case region

The region is on the Czech side delimited by the micro-region of Králíky as a commissioned authority.¹ The region includes municipalities Červená Voda, Dolní Morava, Lichkov and Mladkov. On the Polish side of the border, a strategic study² informs that the whole gmina³ (municipality) of Międzyzlesie has 22 settlements. The region Králíky – Międzyzlesie has 47 settlements together, a total population of 17.5 thousand of whom 6.9 thousand live in the two towns. The area of the region amounts to 35,767 ha. Of these, forests occupy 36.4%. Settlement and land use structure on both sides of the border are comparable (Fig. 1).

In this area, the Polish and the Czech side of the border are connected physico-geographically as the Králícká kotlina Basin constitutes a southernmost segment of the

1) Server of the public administration of the Czech Republic. URL: <http://www.statnisprava.cz>

2) Kierunki strategii rozwoju Gminy Międzyzlesie [study]. Biuro Planowania Przestrzennego Wałbrzych 1999, 50 pp.

3) Primary administrative unit in Poland – gmina is on average considerably larger than the Czech municipality; it contains a number of settlements and rather corresponds to Czech "small districts". The gmina of Międzyzlesie is therefore comparable with the attraction zone of Králíky as a commissioned authority.

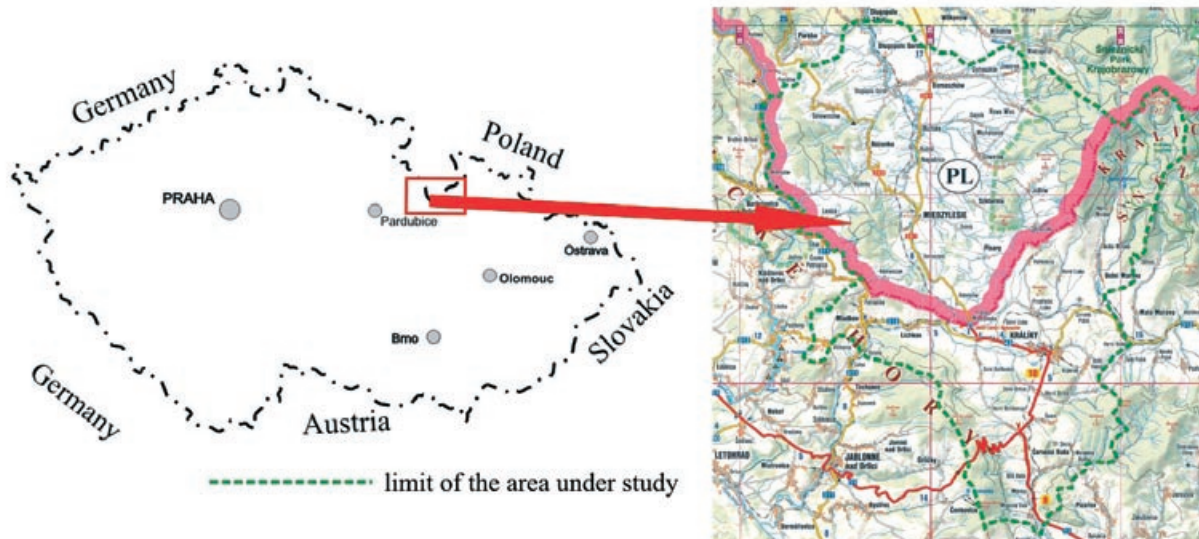


Fig. 1: Area under study

Kłodzko Basin being separated from the other territory of Bohemia and Moravia by relatively high-reaching and difficult-to-pass block mountains. It is assumed that the region of Králiky is likely to have been colonized after 1513 from the side of the Kłodzko Region (Kuča, 1998). There was even a common administrative citizenship for a certain period of time as the Counts of Althanne owned in the 17th century the estates of Králiky and Międzyzlesie with a seat in the town of Kłodzko (Felcman, Semotanová, 2005). The population in the region was mixed. Both sides of the today's state border were inhabited by Germans, Czechs and some Poles. The facts entitle us to look at the space of Králiky-Międzyzlesie as at a case region.

Marginality from both the Czech and the Polish side is a basic peculiarity of the territory. Reasons for marginality are distance from more important urban centres, physico-geographical barrier, borderland position and also consequences of ethnic population changes after World War II. Important long-distance roads pass through the area, but they are used preliminary for regional transport only in the modern era.

On the Czech side, the district town Ústí nad Orlicí which also represents one of the most deprived district centres in Czechia, is situated at a distance of 45 km. The substantially more important town Šumperk is distanced 35 km by Class 1 road No. 11. Theoretically, it represents an alternative, but Šumperk is situated in Moravia and gravity in this direction is not usual. The administrative regional metropolis Pardubice is situated at a distance of 88 km connected by secondary class roads. The actual metropolis of regional importance Hradec Králové is distanced 87 km by road No. 11.

In the case of Międzyzlesie, marginality results also from the fact that the territory is from three sides surrounded

by the state border. Connection with the Polish inland is therefore possible only via a single main communication. The district town Kłodzko is distanced 33 km and the regional center Wrocław 102 km. As to the distance, neither of the Czech centres represents any alternative to the gmina.

2.1 Natural conditions

The region of Králiky - Międzyzlesie is characterized by a very broken relief within the Sudeten mountain range. A central line running through the common territory in the north-south direction is the intermediate mass depression of Kłodzko Basin (Kotlina Kłodzka) whose floor surface is situated at altitudes from 400 - 550 m a.s.l. The Kłodzko Basin terrain is relatively little articulated with the prevailing flat and little inclined relief forms, stream valleys or their sections showing sporadically only a slight incision in the rock foundation. The width of the Basin in the northern part of the concerned area is about 10-5 km; its southern tail reaching into the Czech territory (Kralická brázda Furrow) is 5 to 2 km wide and ends outside the studied area at the town of Štítý.

The low-situated depression stands in contrast with two block mountain ranges rising with the steep and at some places composite scarps of fault origin on its edges. In the west, the range of Bystrické hory Mts. (Góry Bystrzyckie) reaches into Poland in the NNW-SSE direction being partitioned from the similarly stretched Orlické hory Mts. in the East Bohemia by the valley of Divoká Orlice R. flowing along the borderline. On the Czech side, the Králiky region is lined with the Bukovohorská hornatina Upland behind the Tichá Orlice R. valley. In the east, the Kłodzko Basin is lined on the Polish side by the Králický Sněžník (Śnieżnik) massif of borderland mountains with the highest peak at 1 424 m a.s.l. (Fig. 2. see cover p. 2) On the Czech side behind a transversal depression north-

eastwards of Králíky the area of Králícký Sněžník melts into the lower Hanušovická vrchovina Upland.

The development of soils in the Králíky - Międzylesie region was strongly affected by a relatively high climate humidity resulting in a rapid structuring of the soil profile. Soils prevailing in the Kłodzko Basin on sandy, clay and marl rocks and on their weathering products are gleyfied soils (pseudogleys) up to gleyfied cambisols. Unfavourable moisture regime results in disturbed soil moisture/air ratio and in oxygen deficiency. Fixation of nutrients is impaired, humus quality is rather inferior. The dominant soil type of lower mountain elevations is represented by cambisols which are largely acidic up to strongly acidic in connexion with higher precipitation and the prevailing acidic crystalline or even sedimentary substrate. Toward the highest montane altitudes the brown soils gradually pass to rusty soils with podzols up to podzolic soils. Soils represented in the surroundings of spring areas in the mountains are gleys, histosols on peaty ecotypes and rankers on talus slopes. Steep boulder and talus slopes are considerably endangered by erosion.

The studied area is an important European region from the hydrologic point of view since the Klepý Mt. (Trojmórski Wierch) in the group of Králícký Sněžník is a dividing point of the North Sea drainage area (Elbe R. watershed, Orlice R. tributary), the Baltic Sea (Odra R. watershed, Nysa Kłodzka R. tributary), and Black Sea (Danube R. watershed, Morava R. tributary).

The climatic situation in the region of Králíky-Międzylesie closely relates to the region's montane and piedmont location. Climate in the region is cold with lower altitudes of the Kłodzko Basin in Poland sporadically enjoying temperate climate (Tab. 1). Mountain massifs influence the dominant flowing of air masses and the movement of atmospheric fronts that are in our latitudes mostly of south-western up to western direction, being oriented approximately in a perpendicular direction and dividing the area as partial barriers to the air flowing into windward and leeward segments. Moreover, as compared with partial basins, the weather course of higher mountain altitudes is as a rule much more multiform, with a higher temporal and local variability.

climatic zone	CH4	CH6	CH7
Summer days	80-120	120-140	120-140
Frost days	160-180	140-160	140-160
Av. temperature in January (°C)	from -6 to -7	from -4 to -5	from -3 to -5
Av. temperature in July (°C)	12-14	14-15	15-16
Total precipitation in the growing season (mm)	600-700	600-700	500-600
Total precipitation in winter (mm)	400-500	400-500	350-400
Days with snow cover	140-160	120-140	100-120

Tab. 1: Some climatic characteristics of the region

According to the biogeographical division (Culek, 1993) the area of study is situated on the contact of three bioregions of the Hercynian province. The region of Králícký Sněžník is a valuable system of natural and autochthonous stands starting with the communities of montane forests through the dwarfing tree species forms up to the summit community of alpine grasslands.

2.2 Specialities of the historic development

The studied region has experienced several migration waves since the late 1940s. Due to the displacement of Polish-German state borders after the end of World War II the population in the Polish section of the region under study was completely exchanged. In the Czech section a great migration of various population groups followed after the disunion of Czechoslovakia in 1939, during World War II and during the restoration of Czechoslovakia as a national state.

The Czechoslovak exile government was preparing the restoration of Czechoslovakia as a national state of Czechs, Slovaks and Slavonic minorities as back as 1941-1943. At the beginning, president Beneš expected that a part of the Czechoslovak borderland settled with Germans would be resigned and that German administrative units would be established with the German population displaced from all other borderland regions of Bohemia and Moravia (Kural, 1994; Kaplan, 1990). Political solutions of the future arrangement of Central Europe however offered the post-war Czechoslovakia a more liberal possibility – displacement of German population and preservation of Czechoslovakia within the pre-war state borders. The intention could be made true at a cost of depopulating extensive border areas. The depopulated regions should have been partly resettled with the Slavonic population – Czechs and Slovaks from the inland, with Czech and Slovak repatriates and re-emigrants from abroad, etc. The regions were however not meant to restore the original population density and a part of them – namely

mountain areas – were not to be permanently inhabited. Instead, they were planned to become a border zone – a safety belt along the state border and a military space. The remaining territory was to be populated at one third as compared with the original situation in years between the wars. It was assumed that it would be again difficult for people to look for living in the very poor piedmont and mountain areas which might become centres of new disquietude and civil commotion.

The adjacent territories of Králíky and Žamberk districts were stigmatized by numerous migration movements and obscure resettlement plans. It is maintained that the rapid displacement of German population and the slow and as compared with other borderland regions ever delaying accomplishment of the region's colonization on the Czech side and its instable character were caused not only by harsh natural conditions but also by the complicated political situation.

The situation in Kłodzko was also difficult. The Russian party had a practical concern to annex this part to Poland as the new Polish territory was intended to become a new home for the Polish population from the eastern part of Poland that fell to Ukraine and hence to the Soviet Union. Considering their claim of the Prussian Silesia territory justified, Poles tried however to obstruct the Russian and Soviet influence. Czech politicians requested the joining of Kłodzko, Racibórz and Głubczyce districts to Czechoslovakia, reasoning by the historical right and by the multitude of Czech minority in the regions. Moreover, they were quietly hinting on a possible territorial compensation – assignation of the territories by Czechoslovakia in return for the surrender of the Sub-Carpathian Ukraine to the Soviet Union⁴. They established 17 national committees in Kłodzko, which were to become a folk self-government in the region. Several associations came to existence to protect Czech nationals living in Kłodzko – e.g. the Kłodzko National Committee residing in Náchod. Soviet politicians wished a strong Czechoslovakia in which communists were gaining a strong influence. But they also wished to strengthen the influence of the “Lublin Polish government”, and therefore they attached themselves eventually to leave the territory within the Polish state borders. Poland did not incline to communism too much. The state border should be decided upon by the Potsdam conference and by the great powers.

Thanks to a massive support of the Soviet Union, Czechoslovakia retained the Těšín (Czieszyn) district with a compact Polish minority. Kłodzko Czechs remained in the territory that fell to Poland. Poles rapidly

displaced Silesian Germans and together with them also the Kłodzko Czechs who were at the same time German nationals and – as claimed by Poles – could not even speak Czech language. Some of them re-emigrated to Czechoslovakia in a group of about 12,000 persons after 1945. Czechs from Poland settled in the eastern Bohemia and in the northern Moravia.

The region of Králíky was concerned with an essential issue – minimization of German minority. The region was to be newly settled with the Slavonic population that was to be exposed to a full language and cultural assimilation, changes in social structure, employment, etc. In the connection with the post-war settlement it should be mentioned that the Košice Government Programme calculated upon a land reform in which Communists could see a pillar of the national and democratic revolution. The population migration could have made it possible for them to control the newly settled territorial units in the future. The new population was expected to be devoted to communist ideas. The planned initial depopulation and resettlement with the new population should have eradicated the hitherto middle class whose repeated development was not expected any longer by the Communists. According to their plans, shifts in the social sphere were to occur within the framework of territorial migrations, directed toward a gradual creation of the compact mass of new-settler population without any previous experience and skills beneficial for the region.

The first stage of land reform was to be of national character, i.e. it was to be a national revolution. It was based on the confiscation of land and property belonging to nation's enemies and traitors, which was to be subsequently divided among the settlers of Slavonic origin. Viewed by politicians, the main motive was a national one with anti-Nazi focus. The national revolution was enforced by all political parties as it was in accord with the feelings of the Czech population. The second and third stages were to be a revision of the first land reform and a new land reform (Slezák, 1978). Most important for the border regions of Czech lands seemed to be the first stage of the reform because there were four fifths of confiscated farmland in the entire borderland region and an identical number of trades.

Germans from the Králíky area were evacuated in 1945 - 1946. In 1947 - 1948, an additional displacement of local Germans from the Králíky region occurred and in the period from 1948 to 1951 the remaining German

4) Other Czech politicians requested for the surrender of the Sub-Carpathian Ukraine that the Soviet Union would put through a displacement of the whole Hungarian minority from Slovakia including the displacement of Hungarian nationals from the territories of southern and eastern Slovakia detached in 1939.

population was dispersed across the Czech lands in order to be expeditiously assimilated.

Pursuant to Act No. 138/1947 Coll., preferred applicants were foreign army soldiers, participants in national resistance for liberation, persons aggrieved by war, victims of war and Nazi persecution and some immigrants. In the case of more applicants for one allocation MNV (Municipal National Committee) would decide by the competitive principles of allocation proceedings – selecting the applicant with a more favourable profession for the borderland, the applicant with more children, sometimes it could also be economic and social family situation that helped to get the allocation. The choice of applicant was followed by an allocation proposal and appraisal of the estate in which MNV could suggest to increase or decrease the price by up to 25 %. The price was also set according to job character and could put into favour employees in regular jobs. Conversely, price for freelancers was usually increased by 45-100%. The cost estate consisted of the price of house, other structures, land and house equipment. Yearly rentals were multiplied by the coefficient dependent on the class of facilities and on the area in which the municipality belonged. For the purposes of price determination the municipalities were classified into six price categories with a decisive aspect being the number of inhabitants.

A part of settlements were settled by preliminary Czech settlers from closed inland districts – Pradubice, Havlíčkův Brod, Hradec Králové in 1945–1946. According to archives, the district of Králíky was also settled by re-emigrants in 1946-1948 – Czechs from Poland, Volhynian Czechs (Nosková, 1999) and Czechs from Austria. In this period, there were 206 Hungarian nationals dispersed in these districts, who had to leave southern Slovakia and let their farmsteads to Slovak colonists⁵. In this period of time and particularly in 1946, the district of Ústí nad Orlicí was also settled by re-emigrants from the Sub-Carpathian Ukraine. As compared with the regions of northern Moravia, northern or western Bohemia, east-Bohemian regions experienced a relatively low inflow of Slovaks from the inland of Slovakia including Slovak Romanies and a negligible inflow of Slovak re-emigrants from abroad. Individual families settled in these areas were Slovaks from France, Romania (Nosková, Váchová, 2000) and Hungary (Nosková, 2000). Through other migration movements these re-emigrants got to the Králíky region where they live until today.

However, the region of Králíky was little applied for. Although the new settlers were coming, they were

soon leaving after having learnt the local in attractive conditions such as low fertility of local pastures, harsh climatic conditions, border location and marginal industries. The census of 1950 indicated that the Žamberk district population consisted of 32,111 Czechs, 1,215 Slovaks, 55 Ukrainians and Russians, 40 Poles, 475 Germans, 26 Hungarians, 49 other nationals and 34 persons of unspecified nationality.

Both towns lost a big part of population after World War II. The population number of Międzyzlesie decreased from 4,912 in 1946 to 1,929 in 1950 (Łoboda, 2002). In Králíky, only 2,740 persons lived in 1950 against 3,675 recorded by the census in 1930.

As compared with a greater part of other border regions, the post-war Králíky region kept a more pronounced trend of migration. The German population markedly shrank and the population's social structure and way of living entirely changed. The new settlers could not follow the way of living practised by Germans in the Králíky region, which combined several ways of earning bread – farming and pasturage, growing of technical crops, their home processing, trades, crafts, work in local factories etc. The settlers were mainly oriented to farming in more favourable natural conditions. An essential change was brought however by the change of political conditions, by the subsequent collectivization and by the extinction of small-scale production. All this made the Králíky region marginal for a long time, in which the population was changing by five-year plans and by the recruitment of labour force.

According to the census in 2001⁶ the Králíky region was inhabited by 92.6 % of Czech nationals. The largest minority groups were Slovaks (317 persons, 3.3% of population), 78 Germans (0.8%) and 40 Poles (0.4%). Other nationalities were represented only by individuals: 17 Romanies, 17 Ukrainians and 5 Vietnamese.

The Králíky region was unable to cope with the population exchange and with the discontinued traditions in the way of living even after 1989. Problems of the current population to settle in local environment obviously continue despite the exchange of one generation. In demographic terms, the region of Králíky remains to be an interesting region of mixed nationalities with predominant introduced cultural effects – in some cases related to religiousness. From the viewpoint of central authorities, the Králíky region appeared to be the least problematic borderland in terms of both settlement and co-existence of different national and ethnic groups. This is why it was paid only a little attention. The situation

5) National Archives, resources of the Ministry of Interior – confidential 1945-1954, sig. 1218, Lists of Hungarians dispersed in Bohemian and Moravian districts in 1946-1948.

6) Czech Statistical Office Pratur (ČSÚ)

continued later in the 1970s and 1980s. Problems hidden in the economy of realistic socialism emerged as late as after 1989.

2.3 Settlement

The settlement character is similar on both sides of the border. Its core is in fact represented by two small towns of Králíky and Międzyzlesie, each of three thousand inhabitants. Each of the two microregions has a big non-urban settlement (Červená Voda on the Czech side and Domaszków on the Polish side of the border), and several medium-sized villages (Lichkov, Mladkov, Długopole Górne, Goworów). An absolute majority of settlements are small and very small villages with less than 200 and very often even less than 100 inhabitants. The settlement structure is therefore relatively considerably fragmented, which answers the character of piedmont marginal settlement. A certain peculiarity on the Czech side of the border is the fact that all seats are integrated into merely four municipalities that can carry out their tasks very efficiently in this way. On the Polish part it is only a single administrative unit, which is however quite usual in Poland.

Králíky is situated hardly 5 km from the border crossing of Dolní Lipka/Boboszów. The last population census informs of 4,826 inhabitants⁷ living in the Králíky municipality. Of these, 989 persons (a fifth) lived in ten integrated settlements⁸. The town's character of a place open to additional settlement was up to now apparent from the higher share of ethnic minorities (7.4%), mere 30% of religiousness, unfavourable qualification structure (4.8% of persons above 15 years of age with a university degree) and a so far relatively young population base (18.2% of persons at up to 15 years of age). The number of persons in the category from 15 - 65 years was 3 443, of these 2,427 were earning.

Town centre is a historical square on the composition scheme of two parallel streets in water course direction. The square is a concentration of public buildings (town council, grammar school, museum), restaurants and retail shops in parters of mostly two-floor houses with Renaissance cores. The core includes the Church of St. Michael Archangel, which was originally an Evangelic parish. The manor was not restored after the fire in 1708 because the estate seat had been transferred to Międzyzlesie already before. The town's historical core is therefore one of the most preserved ones in the region. Although the town of Králíky came to existence as a location town, its intravillan has engulfed also the original rural built-up area along the Králícký potok Brook, which has been preserved only in fragments. This

oldest part of the town links up with an estate of urban type family houses.

A greater part of the social infrastructure is situated in the space south-west of the square. Parallel with the town axis is a street around which the only concentration of apartment houses of some significance in the town can be found. At the town limits in the direction of Králícký rybník Pond there are facilities of technical infrastructure: a railway station, gas works and a water station that is situated already outside the urban area.

The axis of the eastern section of Králíky is of mixed character. It consists mostly of single-family houses including row houses but one can also find some four-flats and older apartment houses there. Interesting is the original workers colony of Steiner factory from the beginning of the 20th century. This town quarter is enclosed by the manufacturing operations of the former Hedva (textile), Agrostav (building industry) and Sonntag machine works.

The northern section of Králíky is dominated by the manufacturing premises of Novalamp which link up in direction towards the brook with an older area of a so called New yard – a former seat of the estate's economic administration. In the north-eastern section we can find the Adlerberg guest house above which some above-standard family houses have been built of which one with a small wind power plant. The structure of this town quarter combines with the premises of a building material store, a sawmill and an agricultural operation.

The eastern and south-eastern parts of Králíky contain housing developments of various types – single family houses of villa type, row houses, a prefabricated block of flats and apartment houses from the 1950s. The dominant position is occupied by a for local conditions monumental object of the Novalamp dormitory. The main rest zone of the town runs in the southern direction and consists of a house of culture, a park, a playground and an outdoor swimming pool. There are a lot of gastronomic facilities in the area.

Viewed from a distance, the whole town is dominated by a pilgrimage complex with the convent of Servits and the Church of the Assumption of Virgin Mary from the turn of 17th and 18th centuries situated on the Mariánský kopec Hill. The impression is emphasized by an alley with seven hexagonal chapels of the Calvary, which is a continuation of the main town axis and starts with a gate located within the town intravillan (Fig. 3). This

7) Census 2001, Czech Statistical Office Prague (ČSÚ)

8) Statistical lexicon of municipalities in the Czech Republic. ČSÚ/MV Prague 2005, 1 358 pp

is how one of the most distinguished baroque composition in Czechia came to existence in Králíky. The pilgrimage complex contributed to the town's development and represents a remarkable attractivity for tourists until today.

Międzylesie is situated 8 km from the border crossing in Dolní Lipka/Boboszów. The town itself lies in the geographical centre of the municipality (Fig. 4). Its square is dominated by a church and mansion spires. The space is lined with largely three-storey houses with



Fig. 3: The beginning of the Calvary in Králíky (Photo A. Vaishar)



Fig. 4: Międzylesie – the square with the church (Photo A. Vaishar)

commercial facilities in the parter. The square is open to traffic, being cut through by the main road from Brno and Králíky to Kłodzko and Wrocław. The planned bypass east of the town has not been realized up to now due to the lack of funds. Beside the road, another town axis is the Nysa Kłodzka River.

Housing resources include a considerable amount of pre-war apartment houses of which a greater part gives a forlorn impression. Even family houses usually do not have – and did not ever have – any agricultural function (with an exception of small-scale hen keeping or a vegetable garden). New one-family houses represent one street and there are also some of them scattered in the town limits. There is only one typical prefabricated block of flats (near the school) and two apartment houses from the 1990s (provided that these are not refurbished older objects). Manufacturing establishments are few, many of them looking abandoned or with only minimum signs of life. Important is the Institute of Electrotechnics in the south-western part of the town, the manufacturing and service enterprise TIREX, the manufacturing enterprise DOLSEZ and several sawmills. Lively is a relatively big railway station on the western side of the town with apparently important cargo transportation. Traces of traditional weaving can be found only in local names. The town is a forest district seat. Of supralocal facilities we can mention a gymnasium,⁹ a deanery, a polyclinic (former hospital was sold and does not serve any more as a health institution), some shops and services. Below the town, there is a sewage water treatment plant. Refurbished monuments are namely churches. The mansion is not in a good condition. Recreation facilities include a nice outdoor swimming pool, a sports stadium, Hotel Zajazd Sukiennice, a place to erect tents. Bewildering is the lack of catering establishments. Palace gardens have not been preserved until today.

The population of other settlements in the Králíky region recorded in the 2001 census amounted to 4,674 persons. In terms of demographic structure, Červená Voda was overmature with an average age of 40 years (apparently thanks to the localization of a big retirements home) while the other municipalities were markedly younger. The structure of education is rather unfavourable with the shares of inhabitants with the secondary school leaving exam ranging from 17.6% in Lichkov up to 24.2% in Mladkov.

Červená Voda in a strategic location of the southernmost and narrowest promontory in the Kłodzko Basin is situated on a crossing of important first class roads 11 and 43. It has 7 integrated settlements. Some of its manufacturing functions have been retained. It has

also a number of tertiary activities, among other things a health centre, cinema and a range of stores. Dolní Morava is a remote municipality focused mostly on recreational function. It is situated on the Bohemian-Moravian border below the Králícký Sněžník Mt. The recreational infrastructure operates several ski slopes and lifts and a number of hotels, boarding houses and other facilities. Lichkov and Mladkov are compact villages of middle size without integrated settlements. Mladkov was originally a small town with a thousand of inhabitants and a centre of the whole microregion before the foundation of Králíky. Its economic base dwelled in the past on a glasswork, sawmill, flourmills, domestic textile manufacture and on crafts. Lichkov is known as a railway border crossing to Poland. The two municipalities have a well developed fundamental network of services, lodging and boarding capacities of lower standard and privatized agricultural enterprises which have partly retained their production activity.

As to the technical infrastructure for environment, Králíky and Červená Voda are equipped with sewerage systems connected to sewage water treatment plants and gas supply system – but without the integrated settlements. Actual shares of houses connected to the sewerage and gas supply systems are therefore only 26.6% and 35.8%, respectively. Of the total number of 3,203 apartments more than 53% discharge their waste into a sump or waste water collector and nearly 44% of flats are heated with solid fuels. The highest concentration of solid-fuel-heated apartments (524) is in Červená Voda. With respect to the location of the settlements on upper streams and often also in valley locations the impact of communal waste management on environment may be considerable, especially in certain climatic situations.

Settlements of other parts in the Międzylesie municipality can be classified into three types. In the west near the Czech border formed by the Divoká Orlice R. there is an area of devastated dilapidating villages with the remainder of houses and several nicely refurbished rural churches. It can be assumed that a part of the settlement is of summer-house character, many objects are abandoned, economy has been reduced to cattle grazing. Individual cottages are scattered on valley slopes in line with the terrain configuration. A single more expressive point is a pull-up in Nemojów opposite to the border crossing for pedestrians to Bartošovice in the Orlické hory Mts. Social structure is entirely missing.

Settlements in the central part of gmina along the road to Kłodzko and the railway to Wrocław are of a more compact character with at least a basic infrastructure

9) in Polish terminology the gymnasium means a higher primary school (a former council school in Czech)

(shops, elementary schools) and modest economic activities (sawmills, agriculture). Houses are as a rule permanently inhabited. Many objects are refurbished. The most important settlement is Domaszków which resembles a transitional settlement with the council school, commercial facilities and other activities. In this village we can find also a mini-estate of prefab houses from the era of Socialism. The tourist infrastructure is almost missing with an exception of Różanka village with a trade-union tourism facility.

The eastern part of gmina links up with the forest complexes of the Králický Sněžník Protected Landscape Area. Villages are little compact and permanent habitation combines with recreational objects in the broken relief. The neatest village is Goworów with a number of objects for individual recreation, school and a private mansion which is under reconstruction (Figs. 5, 6 – see cover p. 4) Distinct dominants are churches similarly as in other villages. The pilgrimage church in Nowa Więś village is of singular character. In this area we can find a range of organised tourist objects, namely in the areas of Nowa Więś and Jodłów. Increasingly emerging are cottages and summer houses.

Water mains are in Międzyzlesie, Długopole Górne and Domaszków (54 % of population). Sewer systems can be found only in a part of Międzyzlesie. There are also two functional sewage water treatment plants and the rest of waste water ends in the Nysa Kłodzka R. As many as 844 households in the town of Międzyzlesie are connected to gas supply but solid fuels are still massively used for heating. A solid communal waste landfill of 2.2 ha is situated near the road from Międzyzlesie to Goworów. The main source of environment pollution is represented by communal operations and by traffic.

2.4 Economy

The number of persons working in agriculture, forestry and fisheries in the Králický region was only 312 (6.8% of earning population) in 2001, yet it is relatively higher than the national average in spite of unfavourable natural conditions in the region. The plots are mostly situated in conditions unfavourable for farming. There are two agricultural production zones in the region: that of cereals with 26.4% farmland in the region, and the zone of fodder crops taking up the remaining plots. The cereal zone is however of relatively worst category with expressively broken and sloping terrain and soils of poorest quality, i.e. with the below-average growing conditions for most agricultural crops. The most productive part of the fodder zone is its best category occurring on 60% of soils. Worst conditions for farming are in the cadastral areas of Horní Morava and Moravský

Karlov, which constitute an area suitable in agricultural terms only for extensive rearing of farm animals. These facts correspond with the low price of farmland.

Most prominent agribusiness entities in the microregion are Rolnická, a.s.¹⁰ Králický, Zeos, s.r.o.¹¹ Králický (the largest one with 1,224 ha of agricultural land) and Rolnická společnost, s.r.o. Červená Voda ranking with the 15 biggest employers in the region. They are focused mainly on animal husbandry (esp. beef cattle). The growing of crops is focused mainly on fodder production. It can be said that ploughed areas in the region under study are situated in higher elevations than usual, which is considered a hangover of the socialist agriculture. A certain role in local agriculture is played by 11 organic farms.

The Międzyzlesie gmina has 11,541 hectares of farmland available for agricultural use. Arable land is 6,381 ha (33.2% of the gmina area). Two thirds of farmers have plots smaller than 5 ha. On the contrary, areas larger than 100 ha are managed by 4 units. Agricultural subjects have serious economic problems due to the small size of their land property and the lack of finance.

The territory on both sides of the border has all prospects for the specialisation of agricultural production both in agro-tourism and generally in organic farming. Substantial differences can be found in the size of agricultural enterprises.

The number of residents working in industrial operations is 1,747, i.e. 38% of the earning population. Few months ago, the most prominent firm in the region was Novalamp, a.s. Králický, whose produce was light sources, i.e. various kinds of bulbs, fluorescent lamps and gas tubes. Today, the company has lost its competitiveness and employs about 50 persons only. The traditional textile industry is still an important employer in the Králický region. In Králický it is represented by the company limited Webin Králický (ca. 150 employees) with the manufacture of cotton textiles. Food industry is represented by bakeries Zdeněk Falta – Pekárny (over 50 employees). Less than 50 employees has the machine plant Erich Sonntag – Strojírna Sonntag Králický, whose main activities are focused on the manufacture and assembly of steel structures, halls, weldings for earth machines, crushers, bath stoves.

Most prominent companies in Červená Voda are brushworks Kartáčovny, s.r.o., textile works San Valentin, a.s., Intercol, a.s. (each with 100 - 200 employees). The first mentioned company is specialized in the manufacture of brushes, brooms and dust brushes of diverse types, paintbrushes and paintrollers. The textile

10) a.s. = joint stock company

11) s.r.o. = Limited

work San Valentino Červená Voda is specialized in dyeing, bleaching and printing of fabrics and yarns, Intercolor in dyeing and treatment of knitwear (improvement of grey material for further processing). Daily production is about 9 tons of trimmed goods of which some 35% are exported for sewing from the trimmed material by other manufacturers in Italy, Germany, Slovakia and Austria. Apart from these, there is a set of small firms with less than 20 employees in wood-processing, metal-processing and foodstuff industries. The most prominent construction company in the region is Stavofin, s.r.o. Králíky specialized particularly in building one-family houses, small construction works, heating systems and garret extensions. The company has 35 employees and operates technical services in the municipality of Červená Voda.

Although the timber processing industry plays an important role in the gmina of Międzyzlesie, industrial activities in general are minimal with industrial and building companies employing only 4.37 % of the working population. Important manufacturing enterprises in the gmina are Zakład Doświadczalny II Instytutu Elektrotechniki with about 100 employees and Terex with about 30 workers, specialized in timber-processing. Somewhat smaller is Dolsez with the production of fancy pastry (10 employees) and some 10 firms specialized in timber conversion.

Tertiary industry in the region under study is represented by Aeskulap Ltd. Červená Voda (health care), Holy Zdislava House of seniors Červená Voda, House for children Králíky, Town of Králíky, Primary school Králíky, Secondary school of applied arts Králíky, Primary school Červená Voda, Technical Service Králíky, Grammar school Králíky. In Międzyzlesie, main job concentrations in the tertiary sector are The office of the town and municipality, Establishment of communal economy, Frontier guard, Forest plant, Primary school, Polish railroads etc.

3. Main visions and problems of their realisation

The micro-region Králíky / Międzyzlesie intends to base its future prosperity on the development of tourist trade. The landscape, good conditions for winter sports, the pilgrimage complex above Králíky and some other architectonic sights are main attractions. Considerable expectations relate to a possibility of making former Czechoslovak fortresses from the end of the 1930s accessible. The landscape of Międzyzlesie and monuments of the church architecture are attractive on the Polish side. Abandoned houses are suitable for reconstruction to cottages (for inhabitants of Wrocław). The terrain is suitable for cyclo-tourism and hippo-tourism.

The boom of the construction of individual weekend-houses remained away from the Králíky micro-region in the past. There are only some 70 such houses there, which is very few with respect to the beauty of the landscape. Recreational cottages are more frequent (Fig. 7, see cover p. 2). There were 355 such properties in 2001. In the 1970s and 1980s, there were facilities of corporate or trade union recreation in the micro-regions. These have been commercialised and are now used for leisure tourism (especially in Dolní Morava). Almost 1,400 beds of commercial tourism can be found in the Králíky micro-region. Conditions for summer and winter tourism are suitable in the micro-region. There are some ski-areas with adapted downhill courses and running tracks in Červená Voda and Dolní Morava. But occasions of summer bathing are missing and the supply of other sport and leisure activities is limited. Within the thematic tourism, the micro-region offers the fortification system from 1930s with the fortress Bouda and the regional museum in Králíky. The fortification should serve not only as the military museum but also as a homeland exposition of the Orlice region. In Králíky, also the military and regional museum can be included in cognitive tourism. The pilgrimage complex on the Hora Matky Boží Mt. above Králíky can be attractive especially for Polish tourists.

The tourist infrastructure of Międzyzlesie is insufficient. Even with the statistics mentioning 4 accommodation establishments with 452 beds (of these 197 all year round), there is no gastronomic facility (with an exception of one roadside inn) in the gmina. Even if the facilities exist (statistics speak of 6 items), they are out of operation or do not provide services for tourists. The situation is completely unacceptable for Czech tourists. Some agro-tourist activities are isolated and with hardly any connection to other activities. Any significant development of tourism is hardly feasible on the Polish side.

There are about 25 investment project plans in the Králíky micro-region, related mostly to sports tourism. Main activities are focused on skiing, but also on the construction of an aquapark, completion of cyclo-tracks, or access to the border-fortress system to mention some of the ideas. It is expected that a great part of visitors could come from Poland (as far as from Wrocław or even Poznań) and that the implementation of these plans might evoke the building of some accommodation capacities also on the Polish side. The vision gives rise to the questions of landscape carrying-capacity and social system. Similarly, the municipality of Międzyzlesie grounds its future preliminarily on the development of ski-, cyclo- and agrotourism. The vision is to build grounds for sports and recreation in Międzyzlesie including necessary accommodation and boarding facilities.

The experience shows however that hardly any region can thrive only on tourism in our conditions. The seasonal character of tourism and an insufficient preparedness of local inhabitants to gain sources from this branch is the main barrier. In any case, tourism could have a greater share in the economics of the region under study.

This is why it is necessary to keep also other activities in the production and tertiary sectors. The task of agriculture in local conditions is not to produce food but to maintain the landscape. If a part of the territory is not cultivated, its attractiveness falls intensely down. It could have a negative feedback on tourism. Growing of crops for energy could be a certain possibility under condition of state subventions. Extremely small

agribusiness on the Polish side, which is a European anachronism, represent a big problem.

It is advisable to struggle for keeping some industrial production to save jobs diversity. Services of urban character (grammar school, health centre) support local economy, too, but they also improve the intellectual and cultural level of the micro-regions. Main prerequisites include quick development of infrastructure, long-term environmental politics and enhanced labour force skills together with the improving positive image. Although the marginality and natural conditions impact heavily on the region's prospects, capabilities of local population and stakeholders are decisive for the future prosperity.



Fig. 8: The border crossing of Dolní Lipka / Boboszów (Photo A. Vaishar)

4. Future development of the state border

Although the Czecho-Polish border has some historical contact points in the Kłodsko area, no more remarkable cross-border co-operation occurred there after World War II. Conditions for a change came along in the 1990s. It seems however that the potential was utilized only to a small extent. In 2000, the border crossing of Dolní Lipka / Boboszów¹² was passed by 1.884 million of persons, 514 thousand of cars, 6,520 coaches and 28.5 thousand of trucks (Fig. 8). With respect to the total length of the Czecho – Polish border, only 2.6% of persons, 4.9% of coaches and 3.7% of trucks passed the borderline at this place. It can be estimated that a greater part of

the movement was transit between more distant Czech (or even Austrian) centres on one side and Polish centres on the other.

Lados (2004) defines four phases of development in borderland regions:

- borderland without any relation
- beginning co-operation
- co-operative systems
- integrated border region

The situation in the Králiky / Międzyzlesie region can be characterised by the second class (beginning co-

12) Czech Statistical Office, Prague

operation). It is a question if and under what conditions the region can advance to the next levels. With respect to the fact, that the region is marginal from both sides of the border and the marginality will rather deepen, the way of integration is considered to be one of little chances.

Similarly as in other border regions of Czechia, a Euroregion was established in this space. The Euroregion includes the whole territory of administrative regions Hradec Králové and Pardubice (NUTS 3) and some communes of the Olomouc region. It follows that a great part of Glacensis Euroregion communes are not situated in borderland in any case. Such a region can hardly offer a basis for a cross-border co-operation. It is possible to dispute if a solution of problems in marginal border regions was the main motivation for its establishment.

Interests of individual members of the Euroregional association are very different. Efforts of individual participants aim at raising funds for the projects of

individual communes or groups of communes. A certain hope is put on the collaboration between communes situated directly on the border. It is a question, to what extent the local authorities in Králíky and Międzyzlesie have competence and economic power for a real integration of the border space. Another question is, to what degree the area of such an integration should be extended to include for example the territory of Žamberk / Kłodzko.

To create an institutional frame for the integration is not enough. There have to be the respective material frames (branches, activities, entrepreneurs) and, first of all, the local population must be made disposed for the process. In the case of the region under study, this means to bridge over the problems of human factors and a certain reciprocal scepticism. Another question is whether the situation of the Králíky / Międzyzlesie region is specific and to what extent it could be generalized also for other parts of the border.

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THE 25TH ANNIVERSARY OF THE INSTITUTE OF GEONICS OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC

Radim BLAHETA

The Institute of Geonics AS CR, v.v.i. (IGN) is one of the research institutes of the Academy of Science of the Czech Republic, which together with four other institutes belongs to the Section of Earth Science. On January 1, 2007 the Institute, like all other Academy institutes, obtained the status of public research institution (the Czech abbreviation is v.v.i.).

Mission of the Institute

The principal activity of IGN is the scientific research in the field of materials of the Earth's crust, processes inside it, especially those induced by human activity, and the impact of these processes on the environment. Within the scope of this research, supportive disciplines are developed, such as applied mathematics and physics, chemistry, environmental and social geography in particular. The IGN contributes to increasing the level of knowledge and education and to utilizing the results of scientific research in practice. It acquires, processes and disseminates scientific information and issues scientific publications (monographs, journals, proceedings, etc.). It provides scientific assessments, professional opinions and recommendations, consulting and advisory services. In cooperation with universities, the IGN carries out doctoral study programmes and provides training for young scientists. Within the scope of its activity, the IGN promotes international cooperation, including the organization of joint research projects with foreign partners. It ensures participation in exchange programmes for scientists and the exchange of scientific information, as well as the preparation of joint publications. The IGN organizes scientific meetings, conferences and seminars at the national and international levels and provides the infrastructure for research. It pursues its aims both independently and in cooperation with universities and other research and professional institutions.

Brief history

This year, the Institute of Geonics commemorates 25 years of independent existence, which started on July 1, 1982, when the stand-alone Mining Institute (MI) of the Czechoslovak Academy of Sciences (CSAS) in Ostrava was founded. This formal establishment was preceded by development of the institution as an Ostrava branch of Prague academic institutes, mainly of the Institute of Geology and Geotechnics CSAS in Prague.



Prof. Ing. L. Šiška, DrSc. (*1925–†1988)

The Institute was divided into three scientific departments: mining geomechanics, mining aerology and special measurement equipment and geophysics. The first director of the institute,

who principally contributed to its foundation, was Prof. Lubomír Šiška, DrSc. A lot of work connected with development of the Institute was done also by his deputy and the later director, Assoc. Prof. Petr Konečný, CSc.

At that time, the scientific activity of the Institute was oriented to the field of raw material mining with a special focus on physical fundamentals of processes in the rock mass during mining of coal or other raw materials. The research conception was multidisciplinary and interdisciplinary, so that the Institute involved not only geotechnical disciplines but also disciplines from natural sciences.

In 1990, a systematic transformation of the Czechoslovak Academy of Sciences and its research establishment started in a new political and economic conditions. After the formation of the independent Czech Republic a new institution was set up, the Czech Academy of Sciences. At that time a new research plan of the Institute was adopted, basic idea of which was to preserve the Earth's crust as the main subject of the research, but extend the research interests not only to mining but also to many other processes in the geologic environment, especially those induced by human activities. It means that the institute was oriented not only to mining of raw materials, but also to underground constructions, underground reposition of waste materials, new geotechnologies etc. It also includes the field of geoenvironmental consequences of human activities. During the transformations, the Brno branch of the Institute was established as a new institute's body oriented to environmental geography. The transformation of the Institute was underline by a new name and since April 1, 1993 the Institute is called the Institute of Geonics AS CR.

The present scientific orientation

The present orientation of the Institute of Geonics AS CR is given by its research plan entitled Physical and environmental consequences of human activity in the lithosphere. The main scientific topics include:

- study of geomaterials (composition, properties) and their reaction under the influence of physical and chemical processes,
- study of the influence of human activities in the rock mass (e.g. stability of underground constructions, transport and isolation of contaminants etc.),
- analysis and control of the stress and strain fields in regions of mutual influence of natural and human-induced factors,
- efficient methods of numerical modeling with the aid of demanded parallel computations and application of these methods to mathematical modeling of processes in the rock mass,
- new non-classical ways of exploitation of the Earth's crust (geotechnologies, waste deposition etc.),
- non-classical ways of material disintegration by abrasive and pulse water jets,
- study and monitoring of selected physical field in the rock mass,
- Geographical research of the environment with a special focus on the environment and landscapes in regions influenced by European integration processes.

Beside the work on the institute's research plan, the Institute solves about 125 scientific national and international grant projects yearly. Numerous the scientific results have applications in the solution of practical industrial projects. The institute also offers consultancy, mainly in the fields of mining activities and environmental problems.

Educational activities

Many specialists of the Institute read lectures at universities and act as supervisors in doctoral study programmes. The institute also tries to keep the public informed, popularizes the science and motivates the young generation for study and scientific work in engineering and natural science fields of its orientation. Regularly, once a year, it organizes Open Door Days and public lectures within the Week of Science and Technology.



Fig. 6: Residential suburbanisation in Záborské



Fig. 7: New suburban houses in Lubotice



Fig. 8: New suburban houses in Lubotice



Fig. 9: New suburban houses in Lubotice



Fig. 10: Residential suburbanization near Prešov

Figs. 6-10: Examples of family houses in the suburban zone of Prešov

(Photo A. Sedláková)

Illustrations related to the paper by R. Matlovič and A. Sedláková



Fig. 5



Fig. 6

*Contrast of the original (Fig. 5) and new (Fig. 6) houses in the village Goworów (Poland)
(Photo A. Vaishar)*

Illustrations related to the paper by A. Vaishar et al.